Challenges, Opportunities and Trends of Digitalization in Education in the Asia-Pacific Region

APEC Human Resources Development Working Group

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Executive Summary

The report starts with an analysis of the digital education governance of APEC members including specialized agencies, cross-sector approach, decentralized system and mixed approach. It is noteworthy that at economy level, more than one approach is often employed and there is no clear-cut dividing lines among the four categories.

The most recent developments of digitalization in education of APEC members are reflected in three components: innovative digital platforms, government-led initiatives and improvement of access to devices and connectivity.

In retrospect, APEC economies have legislated, developed and implemented laws, strategies, plans, policies and action plans as well as to push forward the digitalization in education, aligned with larger strategy or policy at economy level.

In spite of varied governance systems, APEC members share similar priorities, translated into commitments for harnessing the power of technologies, transforming the educational processes, rebuilding digital governance systems and closing digital divide.

The case studies of best practices are analyzed from four perspectives: Enabling conditions with digital platforms and applications; Financing digitalization through resource mobilization and deployment; Steering innovation by masterplans and frameworks; Forging partnerships in mobilizing the potentials of multi-stakeholders.

In light of regional challenges in advancing digital education, the report identified the strategies that proved instrumental in ensuring that the process of digital learning was effective and productive for all involved.

Moving forward, the policy recommendations are proposed, summarized as a “SEA+ 5C” approach that stand for Structure, Enablers and Accountability with commitment, connection, content, coordination and capacity.

Introduction

In an increasingly digitalized world, digital education is an imperative. Yet it is costly, not only in terms of resources for infrastructure, platforms, applications, but also the education and training of people who manage and apply the instruments and tools. The technological advancements have varied impact, increasing quality and efficiency in some context, and negatively on equity in others.

Evidently the development level and pace of digital education differ among APEC members. It is hard to document the status quo of digital education statistically without large scale surveys. Hence the analysis of this report focuses more on how instead of what, i.e. how digital education governance system is designed and how it works on the basis of data collected from the survey (annex 1).

How does the Digital Education System Work in APEC Economies?

The governance arrangements of digital education differ across APEC members. Looking into the role of a variety of players in APEC economies contributing to the digitalization of education, the systems can be categorized into four types.

Specialized Agency

The education authority, either at central or regional level, usually plays a pivotal role in digital education governance. In some economies, there is one particular section within the ministry of education devoted to the management of digital education, most of them have one single education ministry responsible for administration of all levels of education, such as Educational Technology and Resources in the Ministry of Education of Malaysia, and Educational Technology Division in the Ministry of Education of Singapore, Direction of Technological Innovation in Education in Peru under the supervision of Vice Minister of Education responsible for pedagogical management. In Thailand, the Ministry of Higher Education, Science, Research, and Innovation has been working on digital education for more than 15 years. In the case of Chile, the Center for Innovation in the Ministry of Education is devoted to orient the system in digital education.

Cross-Sector Approach

The Cross-Sector Approach refers to several government agencies implementing digital education together, sharing responsibilities to varying extents. This is consistent to governance structure of respective economies in which several authorities share the responsibilities of education administration separately for basic education, higher education and technical and vocational education and training. Typically, in the Philippines, the government agencies responsible for digital education include, yet not limited to Department of Information and Communications Technology, Department of Education, Commission on Higher Education and Technical Education and Skills Development Authority (TESDA). In these cases, inter-departmental coordination and cross-sector efforts are key to success. With the advantage of mobilizing resources on a larger scope on one hand, it also has bigger challenge of coordination.

Thus one department tends to shoulder larger responsibility in both delivery and management. For example, in the Philippines, the e-TESDA division is responsible for developing quality assured online courses; managing the conduct of research in support to development and delivery of innovative TVET digital products and services; assisting in policy development relevant to online teaching and learning; and providing learner support to the online learners/clientele among others.

Decentralized System

Most federal systems have a decentralized system for the implementation of digital education. The most typical case is Canada. As provincial and territorial governments hold exclusive responsibility over education, there is no one Canada-level department responsible for digital education. However, provinces and territories do come together to share best practices and learn from one another's digital strategies, policies and initiatives, coordinated through the Council of Ministers of Education, Canada (CMEC). Likewise, in the United States, since most education policymaking is done at a regional level, the economy-level platform is often used to highlight great local interventions or bring back best practices for policymakers who are working on specific issues. The federal government facilitates the development of the digital education by legislation and funding support open for application.

Mixed Approach

The governance of the education system is shared between the central government (the Ministry of Education) supported by various education agencies, and schools, such as People's Republic of China and New Zealand. In New Zealand, public responsibilities for providing digital technologies in education follow the devolved context, with part of the digital education infrastructure provided centrally and other parts acquired locally. While provision of digital infrastructure to schools is partly devolved, the overarching rules that govern the access to and use of data and digital technologies in education, including data protection and privacy, are enacted by the central government and apply to all educational levels. The government has also created Chief Digital Officer, Chief Data Steward and Chief Information Security Officer roles to support a whole-of-government approach.

In the Republic of Korea, the Digital Transformation of Education Bureau of the Ministry of Education is responsible for digital infrastructure, AI Textbook, Cloud system for Teacher, and more. Other than MOE, relevant agencies, such as Institute of APEC Collaborative Education (IACE), Korea Education and Research Information Service (KERIS), Korea Education Frontier Association (KEFA) are hosting related projects or events. Additionally, implementation of digital education policy for K-12 is organized by Offices of Education at each 17 provinces.

Part 1: Development of Digitalization in Education in the Asia-Pacific Region: An Update

The advancement of digitalization in the Asia-Pacific region economies has pushed educational systems to adapt and confront its challenges. This part presents the most recent developments in three aspects: innovative digital platforms, government-led initiatives and improvement of access to devices and connectivity.

1.1 Innovative Digital Platforms

Across the Asia-Pacific region, innovative digital platforms have become foundational to enhancing educational delivery and access. Hong Kong, China has made significant strides with its Hong Kong Education City Limited (EdCity), which not only provides digital resources but also offers a platform for interactive learning and teacher collaboration. Singapore Student Learning Space (SLS) represents a pivotal development in digital education, offering tailored learning experiences that encourage student engagement and personalized learning paths. Similarly, Malaysia has developed and deployed a platform called DELIMA, that provides tools, services, and contents for all students and teachers to enrich teaching and learning.

In contrast, Thailand employs a broad approach with its economy-level MOOC provider, which democratizes access to education by offering a variety of online courses that cater to diverse learning needs across the economy. This initiative highlights a shift towards more open educational resources, allowing students from all backgrounds to access high-quality educational content. These platforms exemplify the region’s commitment to integrating digital technologies in a way that enriches the educational experience and ensures continuity in learning, regardless of geographical and socio-economic barriers.

The success of these platforms is also a testament to the region's ability to adapt to the rapid changes in the digital landscape. They serve not only as educational tools but also as catalysts for broader educational reforms, influencing curriculum design, teaching methods, and assessment strategies. The integration of these platforms into everyday educational practices marks a significant transformation in the way education is delivered in the Asia-Pacific region, making it more inclusive, accessible, and tailored to the needs of the 21st-century learner.

1.2. Government-Led Digital Education Strategies

Government initiatives are central to the proliferation of digital education across the Asia-Pacific region. People’s Republic of China has developed China Smart Education Platform, sharing selected curriculum and courses to students at various levels of education. Malaysia's Digital Education Policy (DEP) showcases a strategic approach to embedding technology in education, focusing on creating an ecosystem that supports digital learning at all educational levels. This policy framework is instrumental in guiding the development of digital infrastructures, curricular integration, and teacher training programs. Similarly, Singapore’s EdTech Masterplan 2030

aims not just to incorporate technology into classrooms but to transform the educational environment by leveraging advanced technologies to foster deeper learning and problem-solving abilities.

New Zealand offers another model, where the government emphasizes the scalability of digital tools to ensure that educational resources are universally accessible. This includes substantial investments in connectivity and technology, particularly targeting remote areas to ensure that every student has the opportunity to benefit from digital learning. These strategies underscore a significant shift from traditional educational paradigms to more dynamic, flexible, and student-centered learning environments that are supported by digital technologies.

The effectiveness of these strategies depends largely on continuous evaluation and adaptation to ensure they meet the evolving needs of students and educators. As these governments deploy these policies, they also set benchmarks and gather data to refine and optimize digital education initiatives. This proactive approach helps in anticipating future educational needs and aligning them with technological advancements, thereby sustaining the momentum towards more integrated and technologically equipped educational systems.

1.3 Enhancing Digital Access and Connectivity

Enhancing digital access and connectivity remains a pivotal focus for economies in the Asia-Pacific region. Efforts in the Philippines and Thailand to extend broadband infrastructure and distribute digital devices are crucial in addressing the digital divide, ensuring that students in less urbanized areas have the same educational opportunities as those in cities. Chile's initiative to provide and improve connectivity underscores a region-wide commitment to making digital education accessible to all, reflecting a recognition of the essential role that technology plays in modern education. Notably, in China, the Internet access rate of schools at all levels has reached 100%, more than 75% schools have achieved wireless network coverage, and 99.5% schools have multimedia classrooms.

These initiatives are accompanied by policies that not only focus on infrastructure but also aim to cultivate a digital culture within educational settings. This includes training programs for teachers and students to ensure they can effectively utilize digital tools, thereby maximizing the potential of technology to enhance learning outcomes. Such comprehensive approaches are critical in realizing the full benefits of digital education, particularly in improving student engagement and facilitating the development of digital competencies.

However, challenges such as ensuring consistent and reliable internet access and overcoming resistance to the adoption of new technologies in more traditional educational institutions continue to pose barriers. To address these, governments and educational authorities are increasingly partnering with tech companies and leveraging public-private partnerships to accelerate the expansion of digital infrastructure and the integration of innovative educational technologies. These collaborations are vital in scaling up the reach and impact of digital education initiatives, paving the way for more resilient and adaptable educational systems.

The ongoing digital transformation in the Asia-Pacific region highlights a robust commitment to leveraging technology to enhance educational access, quality, and relevance. As these economies innovate and adapt to new technologies, they set a global standard for how digital solutions can be integrated into education systems to address contemporary challenges and future demands. This report reflects the dynamic and evolving landscape of digital education in the Asia-Pacific region, offering insights into the strategies, challenges, and advancements that are defining this critical sector.

Part 2: Policy Trends on Digitalization in Education: Evidence-based Analysis

Policies, plans and strategies direct the development of the digitalization in education. Across the Asia-Pacific region, a variety of policy instruments are developed and implemented to enable the digitalization of education. The survey on the high-impact policies, plans and strategies for digital education that have been formulated and implemented in APEC member economies identified four types policy instruments that mainstreams in APEC member economies.

- Legislation

Digital education is integrated in laws for digital equity or holistic development. It becomes more powerful when combined with the incentive of funding. For example, In the USA, the Bipartisan Infrastructure Law (BIL) addresses digital equity through a USD65 billion investment, which aims to provide learners, families, and caregivers with the connectivity they need to engage in technology-enabled learning opportunities. As part of the BIL, the Digital Equity Act calls on states to develop digital equity plans that identify barriers to digital inclusion and set measurable objectives to address them.

- Strategy and Master Plan

Most of APEC members have developed strategies, master plans or long terms plans to spell out pathways for digital education. Some of these are developed under overarching developmental strategy such as New Zealand’s digitalization strategy, the “Digital Strategy for Aotearoa and Action Plan”, which aims to modernize and transform public service.

China Strategy of Digital Education was launched in 2022, with core concepts of "3Cs" namely, connection, content and cooperation, the principle of "application as precedence, service as priority, simplicity and efficiency as well as safe operation”. By bringing together typical applications and integrating quality resources, the strategy aims to realize the amplification, juxtaposition, multiplication and continuous spillover effect of digital technology for high-quality development of education.

Moreover, aligned with the Education 2030 Agenda of the UNESCO, APEC economies have formulated masterplans on the digital transformation of education towards 2030. Typically, Peru enacted an economy-level policy for digital transformation to 2030. In the same vein, Singapore launched “Transforming Education through Technology” Masterplan 2030 (“EdTech Masterplan 2030”), which seeks to deepen technology-transformed learning as part of the Future of Learning, in order to prepare students for a technology-transformed world.

In 2023, aligned with the overarching Digital Strategy for Aotearoa, New Zealand has developed and released a strategy for education agencies – *Connected Ako: Digital and Data for Learning*, a 10-year strategy (2023-2033) to guide the digital and data approaches of New Zealand government education agencies through a set of principles and outcomes that are applicable to all levels of education. The principles of *Connected Ako* will help shape ongoing budget and resource decision-making by education agencies. A light-touch monitoring mechanism is being put in place through a board which has representation from the Ministry of Education, New Zealand Qualifications Authority (NZQA), and Tertiary Education Commission (TEC).

- Policies and Action Plans

Policy facilitates transformative changes in the education system, ensuring that teaching and learning practices are continually updated to align with the latest advancements and requirements in education to meet the needs of economies.

In People’s Republic of China, the “Development Plan on the New Generation of AI” issued by the central government facilitates boosting the development of a new generation of AI to better serve mankind and young generations and served as an overarching framework for AI education. In Brunei Darussalam, the development of Policies & Guidelines on Generative Artificial Intelligence (GenAI) also sets direction for AI-related education.

In New Zealand, schools are required to develop strategic and annual plans and report to the Ministry of Education on outcomes. However, though it is highly likely that these will include digital technologies, it is not required. It is at the discretion of the school.

Strengthening Learning axis, a policy framework of Chile as part of the Reactivation Policy, addresses gaps in access and use of technologies in the school system, by making relevant curricular and pedagogical resources and strategies available at each of the educational levels and modalities. It also supports the contextualized implementation of the teaching and learning processes, in addition to strengthening the link between the educational community, families and their territories, providing support and accompaniment to the teaching and professional body, through a pedagogical and school support system to the students.

In Canada, as provincial and territorial governments hold exclusive responsibility over education, there is no digital education strategy at the economy level. Provinces and territories have developed their own strategies. For example, in 2018, the province of Quebec released a comprehensive Digital Action Plan for Education and Higher Education to support the development of digital literacy, enhance teaching and learning practices with digital

technologies, and create an environment conductive to the development of digital technologies in the education system.

- Standards and Frameworks

To ensure the quality of the digitalization in education, standards and frameworks have been developed in APEC economies at various levels of education.

In Peru, the Technical Standard entitled "Specific provisions for the implementation of the improvement of educational facilities to improve accessibility conditions and the acquisition of materials for pedagogical and technological use for the care of students with special educational needs associated with disabilities" for the year 2021 through a Ministerial Resolution. Likewise, normative document "Provisions for the development of the Program to Strengthen the competencies of teachers who use portable electronic devices" and "Guidelines for the incorporation of digital technologies in basic education" were approved by vice-ministerial resolution.

Digital competency framework defines the core competencies expected of students in the digital transformation of education and is taken as priority of curriculum reform in APEC economies. In Canada, many provinces and territories developed digital competency frameworks, outlining skills that students should acquire at school in relation to the use of digital technology and communication tools. Alternatively Typically, the Digital Literacy Framework was developed in British Columbia, encompassing skills such as technology operations; information literacy; privacy and security online; digital footprint online; legal and ethical aspects; and learning about and with digital technologies.

In 2018, New Zealand published the Digital Technologies and Hangarau Matihiko curriculum for primary and secondary education. To support its implementation, the Ministry of Education also pursued a set of initiatives including professional development and program financing, teaching and learning resources available online, and public and private partnerships.

Part 3: Digitalization in Education in the Post Pandemic Era: Best Practices and Lessons Learned

"Digital" is not simply about computer hardware and software, the infrastructure that supports it, and the data that is integral to these systems. It is also about rules and policies governing digital technologies and their application, and the wider-socio-technical systems that digital sits within. It is also critically about people having the capability – the knowledge skills and discernment – to navigate and succeed in digital environments.

3.1 Harnessing the Power of Technologies

Technology serves as cornerstone of digital education. Technology-related issues are priorities

for both developed and developing economies, ranging from infrastructure to blockchain and ChatGPT. For example, in Canada, the most pressing issue for digital transformation of education is ensuring that education institutions and students have equitable access to reliable high speed internet connection, especially in underserved and remote areas. Similarly, removing barrier to access and ensuring digital equity access ensuring learners of all ages can access the benefits of digital learning and assessment is a high priority issue in New Zealand.

At another end of the spectrum is the application of emerging technologies such as blockchain in education. The recent and rapid evolution of distributed computing and blockchain technology has pushed people to rethink and reimagine many of the foundational aspects of traditional systems of education. Concepts like trust, value, privacy, and identity are all coming into question with emerging technologies.

Usually a mix of digital technologies are employed to broaden access to learning opportunities and also improve the cost-efficiency of delivery. For example, Brunei Darussalam provides learning management systems, digital resources management, smart classrooms, and MOE television. These technologies help to ensure that students have access to the best possible educational resources and can achieve their full potential.

Learning, teaching, assessment, and research are intertwined and work together for quality education, in particular, by making best use of data and digital. On one hand, innovating teaching methods, including the competency assessment using digital technologies, presents challenges due to the huge investments required in advanced equipment and technologies; on the other, innovation in digital tools for assessment can increase the cost-efficiency of education considerably.

The United States reported that the effectiveness and quality of digitalization in education is dependent on how well the impact of emerging technology is being understood. As emerging trends in technology enable new capacities for innovative approaches to education, collective understanding of and accountability for emerging technologies' effectiveness and equitable design, development and implementation is critical to optimizing learners' experiences. Thus it is crucial to establish a vision for how emerging technology can be used to deliver safe, effective, and fair learning experiences.

3.2 Transforming Education Processes

Core business of education is learning, and the transformation of education will eventually occur in the classroom either physical or virtual. This explains why "innovation in teaching with digital technologies" has been chosen by Canada; Chile; People's Republic of China; Hong Kong, China; Republic of Korea; Malaysia; The Republic of the Philippines; and Singapore as priorities.

Developing and integrating digital content that aligns with curriculum goals and standards is pivotal yet challenging to transforming education process. Online curriculum and courses can substantially change students' learning landscape and broaden their horizons of knowledge and skills. In New Zealand, the Technology Learning Area was revised to "strengthen the positioning of Digital Technologies in Curriculum in 2017. The goal of this change is to ensure

that all learners have the opportunity to become digitally capable individuals. An online curriculum hub was launched in 2023 that integrate and rehouse the resources from two websites: one provides learning resources for primary and secondary educational levels for English-medium resources and the other for Māori-medium resources covering a range of subjects classified according to the relevant curriculum framework.

Echoing “the quality of education system can never exceed that of its teachers”, the Digital innovation in teacher professional development is chosen by Canada; Chile; China; Hong Kong, China; Republic of Korea; Malaysia; Peru; The Republic of the Philippines; Singapore and Thailand as one of the most pressing issues in digital transformation of education. Digital innovation in teacher professional development has seen a significant shift post-pandemic, with teachers becoming more accustomed to the digital learning ecosystem compared to their familiarity before the pandemic. To address such need, Malaysia has developed the MyDigital Trainer program that aims to equip instructors with the skills and knowledge they need to utilize and disseminate digital learning resources to their clients during training and courses. However, ensuring the high quality of teacher training through online platforms remains a challenge for providers to effectively implement with a strategic approach that prioritizes engagement, interactivity, and practical application.

In addition, digital evaluation and assessment have been prioritized by Canada; People’s Republic of China; Hong Kong, China; and the Philippines in the digital transformation of education. Teaching, learning and assessment is also taken as high priority by New Zealand, and the Ministry of Education provides digital tools for assessment, for example, the online e-asTTle assessment tool that enables teachers to conduct formative assessments in their classrooms or remotely on reading, mathematics and writing at the primary and lower secondary levels. The Progress and Consistency tool (PaCT) is another evaluation tool provided by the Ministry that assists teachers in making judgements about student progress in reading, mathematics and writing.

These are mostly realized through online platform, as noted by Canada, supporting the development of online education platforms, and developing digital resources for teachers and students are also priorities. Indonesia launched the Merdeka Belajar (Freedom to Learn) Platform to provide free online learning resources, teacher training modules, and educational broadcasts. This platform is an inclusive learning platform enabling teachers to upskill themselves, get context-specific teaching materials, and share best practices.

It is noteworthy that the digital transformation of education warrants a new role of open education. Originated from correspondence, open education is increasingly mainstreamed as key player in the digital transformation. Particularly, advancing open education is indicated as high priority by People’s Republic of China and the United States, both committed to creating an open education ecosystem. Likewise, 'Thailand Cyber University' aims to enhance access to quality education and lifelong learning opportunities for Thai citizens through the ThaiMOOC platform.

3.3 Rebuilding the Education Governance System

Digitalization in administration and management holds the key to the efficiency of digital transformation of education. A robust digital education system is premised on a trusted data ecosystem as well as coordinating digital approaches. In the case of New Zealand, coordinating digital approaches refer to a planned deliberate approach to promoting digital innovation, partnering with educators, interested stakeholders and the EdTech sector to support education system and create international economic opportunities.

School-Community Partnerships in Digital Education also counts. As illustrated by the United States, when educational systems partner with families and communities to support the effective use of technology in teaching and learning, learners will benefit from both optimized school-community partnerships and educator capacities to increase transparency, extend learning time, and resolve pitfalls of technology usage by learners.

Indonesia launched the Merdeka Belajar (Freedom to Learn) Platform to provide free online learning resources, teacher training modules, and educational broadcasts. This platform is an inclusive learning platform enabling teachers to upskill themselves, get context-specific teaching materials, and share best practices.

With the technological developments in education, the topic of safety is shifted from that on campus to digital world. Cyber security, as highlighted by New Zealand, is also on the list of priorities, in particular, protecting learners, providers, and the integrity of data.

3.4 Closing the Digital Divide

The digital transformation of education is a complex process influenced by various factors and challenges. It risks widening the digital divide. There can be a significant gap between learners who have access to digital technologies and digital education and those who do not. Socio-economic and related factors are also strong predictors, especially among schools with limited support budgets and in low-income areas. Hence one of the key issues for the digital transformation of education is to ensure affordability.

In the USA, the first priority of the digital transformation of education is listed expanding Broadband Access and Technology-Enabled Learning – the implementation and adoption of affordable, reliable, high-speed broadband and devices in schools, homes, and the community can support learners' foundational technology access, which enables anywhere, anytime learning. Likewise, New Zealand has invested in supporting access technologies in educational institutions, particularly ensuring home connectivity, and providing or leasing digital devices to schools. During the COVID-19 pandemic, New Zealand scaled up efforts in Equitable Digital Access programs which are ongoing.

Loaning devices and providing internet access to underprivileged students, as done in the Philippines, ensures inclusivity. Canada's investments in rural internet infrastructure serves the same purpose.

To address the needs of the disabled, Peru has enacted the Technical Standard entitled "Specific provisions for the implementation of the improvement of educational facilities to improve accessibility conditions and the acquisition of materials for pedagogical and technological use for the care of students with special educational needs associated with disabilities for the year 2021 through a Ministerial Resolution.

Part 4: Case Studies: Best Practices in Digitalization in Education

The COVID-19 pandemic has brought about a significant transformation in the way APEC economies approach learning. With the adoption of digital learning, economies have been presented with both challenges and opportunities. However, the experiences of these economies offer valuable lessons that can be learned.

Below are the case studies that highlight the diverse ways in which digital technologies are implemented in different APEC economies.

4.1 Enabling Conditions: Digital Platforms and Applications

The above-cited best practices are mostly realized through online platforms, supporting the development of online education platforms, and developing digital resources for teachers and students are key priorities in the digital transformation of education. There are essentially two types of digital education platforms, centrally administered and locally developed.

4.1.1 Centrally Administered Digital Education Platform

Chile: One Dedicated Platform as Comprehensive Resource Hub

In response to the challenges posed by school closures resulting from a public health emergency, the Ministry of Education in Chile has developed a dedicated platform. This platform serves as a comprehensive resource hub, offering strategic initiatives aimed at reactivating education.
https://www.curriculumnacional.cl/portal/Recursos-Reactivacion-Educativa/

The platform comprises several sections and resources aimed at supporting educational reactivation. These are organized according to different criteria and accessible via specific login credentials.

The platform encompasses three distinct sections:

- Reading, Writing, and Oral Communication: This section facilitates learning through reading, writing, and oral communication. Users can categorize resources based on their proficiency level and type of resource, including classroom activities, materials for families,

and teaching recommendations.

- Mathematics for Real-World Learning: This section provides resources for learning mathematics within real-world contexts, encompassing aspects of school life and mental health.
- Socioemotional Development: Resources in this section are dedicated to supporting students' socioemotional development.

Additionally, the platform features several supplementary initiatives:

- Higher Education Admission: This website serves as a gateway for higher education admission. https://acceso.mineduc.cl/
- I Learn Online: This website offers a comprehensive array of online learning resources, including curricular documents, evaluations, standards, school textbooks, digital resources, and school libraries. Access is restricted to teachers, students, and parents, who must provide their school identification number. https://www.curriculumnacional.cl/portal/
- Digital Books and Reading Material: These websites provide access to digital books and materials aimed at enhancing and reinforcing reading skills for students and families. https://catalogotextos.mineduc.cl/catalogo-textos/login/login?tipo=ee and https://bdescolar.mineduc.cl/?locale=es

This platform has played a vital role in promoting educational continuity and equity in Chile. It has improved accessibility to economy-wide educational resources, offering diverse learning opportunities in areas like reading, mathematics, and socioemotional development. Additionally, the platform has facilitated the transition to online learning and supported students' aspirations for higher education through supplementary initiatives.

People's Republic of China: From Improvised Digital Platform to UNESCO Flagship Application

During the COVID-19, the Ministry of Education of People's Republic of China responded by launching an economy-wide network cloud platform for K-12 schools in February 2020, aimed at facilitating economy-wide online education practices. Subsequently, to advance the digital transformation and modernization of education, the platform underwent an upgrade. In March 2022, it was relaunched as the Smart Education of China (https://www.smartedu.cn/), with a focus on integrating high-quality resources and expanding educational services across the economy. By the beginning of 2023, the platform had amassed an extensive array of resources, including 44,000 K-12 education courses, 6,757 vocational education courses, 27,000 MOOCs, and experimental higher education courses. This initiative has provided high-quality education to 290 million students, irrespective of their geographical location. It has connected with more than 519 thousands schools, offered more than 50,000 online MOOCs, involving 293 million learners from 200 economies and regions.

The development and implementation of the Smart Education of China platform involved strategic planning and coordination by the Ministry of Education. The platform's upgrade was executed in accordance with the decision and deployment of the Central Committee of the

Communist Party of China, with a focus on accelerating education informatization and modernization through the following actions:

- Enrichment of digital education application scenarios across all levels and types of Chinese schools.
- Promotion of integration and development of digital technology alongside traditional education.
- Fostering innovation in educational concepts, methods, and forms.

Empowerment of digital technology to enhance education delivery and better serve the essence of education. As of September 2023, the web portal and 4 platforms have had more than 33 billion total page views and 2.2 billion total visitors. The Smart Education of China platform has significantly contributed to promoting economy-wide educational continuity and equity. It has facilitated access to high-quality educational resources for students across urban and remote areas, fostering innovation and integration in digital education practices. China Smart Education Platform was honored for the UNESCO King Hamad Bin Isa Al Khalifa Prize for Informatization in Education for the year 2022, for its outstanding achievements in "promoting public access to knowledge through digital learning platforms".

4.1.2 Local Approach to Digital Education Platform

Canada: Digital Education Platforms Developed by Provinces and Territories

Most Canadian provinces and territories develop their own digital education platforms aimed at enhancing the teaching and learning experiences as well as the sharing of educational resources and information. The platforms are created and managed by individual provinces and territories, each providing login credentials to teachers and students for access.

- Quebec: Québec's L'École Ouverte platform allows users with login credentials (provided by their schools) to access a dedicated Ma Classe ("My Classroom") space. On Ma Classe, students can find both static and interactive resources to foster and consolidate their learning; teachers can retrieve peer-reviewed digital teaching resources in Québec or create their own resources, using their individual space as a workshop; and parents can find reference tools to provide their children with appropriate support. The platform features a set of assistive tools for accessibility, and some curated resources are tailored for students with special needs.
- Saskatchewan: The province of Saskatchewan has a similar educational platform, EDonline, which is accessible through login credentials given to all teachers and students in the province.
- Alberta: In Alberta, students, parents, and teachers have access to New.LearnAlberta.ca, a bilingual platform that houses Alberta's new curriculum, learning and teaching resources, and other tools and information that support the implementation of the curriculum.

Although these platforms are provided by specific provinces or territories, a share of the digital teaching and learning resources is openly available to anyone in Canada. For instance, TV

education content, initially aired during the COVID-19 school closures, is now curated online. Examples include Québec's Télé Québec's Passe Partout and educational TV programs from other provinces like Saskatchewan. All content is mapped to provincial or territorial curricula but is accessible to any Canadian.

4.1.3 Mixed Approach to Digital Education Platform

USA: Synergizing Federal, State and Local Resources for Digital Education Platforms and Applications

The U.S. Department of Education has identified key priorities to advance digital education, aiming to enhance broadband access, advance open education, foster digital literacy, explore emerging technologies like blockchain, and strengthen school-community partnerships in digital education.

The Bipartisan Infrastructure Law (BIL) addresses digital equity through a USD65 billion investment, which aims to provide learners, families, and caregivers with the connectivity they need to engage in technology-enabled learning opportunities. As part of the BIL, the Digital Equity Act calls on states to develop digital equity plans that identify barriers to digital inclusion and set measurable objectives to address them.

Digital education platforms and applications have been developed through synergizing the resources at federal, state and local levels.

- Data or Information Systems such as EMIS, Student Information Systems (SIS): This data is collected and available at the state level. Student standardized test results, socio-economic, and demographic markers are filtered up to the U.S. Department of Education, in particular, the US Center for Education Statistics through Statewide Longitudinal Data Systems Grant Program.
- At the state and local level, some SIS systems use non-AI-based algorithms, AI-based algorithms, both, or neither. Some state and district level SIS vendors may integrate functions like early warning systems that flag students as "at risk" if they meet certain thresholds in terms of standardized test scores, academic grades, school attendance, or behavioral characteristics such as suspensions.
- Learning Management Systems (LMS) - States and local districts manage their LMS. LMSs at the state and local level have the following characteristics: publicly owned (many), licensed from a commercial provider (many), display analytics dashboard (most), interoperable with system-level and institutional-level systems (some), providing learning and other content repository (some), and offering communication tools (some).
- More information on how different states approach their ed tech strategies is collected by the State Educational Technology Directors Associations (SETDA).

As a result, these initiatives have enhanced digital education accessibility, quality, and effectiveness in the United States.

4.2 Steering Innovation: Frameworks and Strategies

APEC members steer innovation for digitalization in education through frameworks and strategies in particular, guidelines formulated and incentives built into relevant policies.

Singapore: Transforming Education Through Technology Masterplan 2030

Under the EdTech Masterplan 2030 for the General Education sector, Singapore aims to enhance teaching and learning by leveraging technology more extensively, placing greater emphasis on: Harnessing new technologies, especially Artificial Intelligence (AI); Enhancing the development of students' digital literacy and technological skills critical to succeed in a technology-saturated world; and strengthening the practice of sharing and adapting technology-enabled lessons, resources and good practices in subject departments, to ease teachers' workload and promote a culture of collaboration.

Vision

To prepare students for a Technology-transformed World through Technology-transformed Learning.

Outcome Goals:

- Students: Digitally-empowered, future-ready learners and innovators
- Teachers: Technologically-adept, collaborative learning designers
- Schools: Intelligent, responsive, digitally-equipped learning environment
- System: Networked EdTech ecosystem

Strategic Thrusts

- Developing our students to be digitally-empowered, future-ready learners and innovators through:
  - ST1: Greater customization of students' learning
  - ST2: Strengthening development of students' digital literacy and technological skills (starting with AI literacy)
  - ST3: Empowering development of students' 21st Century Competencies
- Empowering our teachers to be technologically-adept, collaborative learning designers through:
  - ST4: Strengthening school and department culture of collaboration and EdTech practices
  - ST5: Strengthening teachers' EdTech practice

Key Enablers

- Learning Analytics & Data: Enhance schools' ability to use data for decision-making

- School Infrastructure, Support & Processes: Redesign learning spaces and expansion of wireless coverage in schools to support technology-enabled learning
- EdTech Ecosystem: Establish network of partnerships and facilitate crowdsourcing of resources and solutions from teaching fraternity
- Parent Engagement & Partnership: Enhance parents' capacity to provide students with a conducive home environment for positive digital engagement

Implementation Timeline

- Schools in Singapore are given the flexibility to start the implementation of the "Transforming Education through Technology Masterplan 2030" (also known as Edtech Masterplan for short) initiatives from 2024 to 2027.
- Schools also have the autonomy to pace their implementation of the EdTech Masterplan 2030 initiatives, such as choosing to start off first with the enculturation of EdTech practice in subject departments.
- The EdTech Masterplan 2030 will be fully implemented in all schools by 2030

4.3 Financing Digitalization: Resources Mobilization and Deployment

In the context of APEC, digitalization is materialized though resource mobilization and deployment through various approaches and strategies.

New Zealand: Finance Strategy in Devolved Context

In New Zealand, the governance of the education system is shared between the central government (the Ministry of Education) supported by various education agencies, and schools. As noted earlier, decision-making is highly devolved: schools and kura (Māori-medium public schools where teaching is based on Māori culture and values) have autonomy over their curriculum, assessment and resource allocation, whereas the Ministry of Education and government agencies focus on supporting teachers and education providers, developing economy-level policy and curriculum frameworks, and calculating and delivering operational funding and staffing entitlements to all state-funded schools and kura.

Public responsibilities for providing digital technologies in education follow the devolved context, with part of the digital education infrastructure provided centrally and other parts acquired locally. Independent private schools fall somewhat outside the remit of the government's digital strategy and their provision and funding of digital infrastructure. While they are part-financed by the government, they must acquire their digital hardware infrastructure (Internet and devices) with their own budget and in some cases may not be able to access publicly procured software made available to public schools by the Ministry.

While provision of digital infrastructure to schools is partly devolved, the overarching rules that govern the access to and use of data and digital technologies in education, including data protection and privacy, are enacted by the central government and apply to all educational levels.

In particular, central government publicly provides or funds digital infrastructure for system and institutional management at all levels of education for government and government-integrated schools. This includes internet connectivity, cyber protection, laptops for teachers and a limited form of student information system that tracks compulsory sector enrolment, exam administration systems, and some administrative and facility management systems. The government also provides resources to support teaching and learning in primary and secondary education, including some that are centrally procured from commercial providers and made available to schools. Early Childhood Education (ECE) and tertiary institutions must acquire their own resources for teaching and learning.

Schools have autonomy in New Zealand to acquire and use their own digital infrastructure, both for institutional management and for supporting teaching and learning. Only a minority of (but not all) system management tools must be used by all public schools.

New Zealand has invested in supporting access technologies in educational institutions, particularly ensuring home connectivity, and providing or leasing digital devices to schools. During the COVID-19 pandemic, New Zealand scaled up efforts in Equitable Digital Access programs which are ongoing.

The Ministry also funds Te Aho o Te Kura Pounamu, a distance education provider that offers a wide range of learning programs for students (early childhood through to secondary education) and follows the New Zealand curriculum.

Hong Kong, China: Integrated Resource Deployment

To align with the global trend of harnessing information technology to enhance the effectiveness of learning and teaching, the HKC Government has provided resources since the 1998/99 school year in implementing strategies on Information Technology (IT) in Education (https://www.edb.gov.hk/en/edu-system/primary-secondary/applicable-to-primary-secondary/it-in-edu/policy.html).

As e-Learning and STEAM education go hand in hand, the EDB has integrated the strategies on IT in education into the planning and implementation of STEAM education. While stepping up the promotion of STEAM education, emphasis will be placed on cultivating students' positive values and attitudes, particularly in enhancing their media and information literacy in the digital era, so that they can become ethical users of information technology.

To support schools in implementing blended mode of teaching and learning, the HKC Government has set aside resources in the Quality Education Fund (QEF). Resource is reserved to implement the 3-year program from the 2021/22 school year to subsidizing schools to purchase mobile computer devices and Internet access facilities for loan to financially needy students. In each of the first two years (2021/22 and 2022/23 school year), about 700 schools participated in the program, benefitting about 43000 students in total.

Resource reserved by QEF is used to implement the "QEF e-Learning Ancillary Facilities

Programme". A total of 22 projects are being funded for developing resources and ancillary facilities for e-learning such as platforms for sharing learning and teaching resources, e-assessment items and e-learning apps. These projects will deploy innovative technologies, including artificial intelligence and big data, to enhance learning and teaching effectiveness in a wide array of subjects, benefiting secondary, primary and kindergarten students, as well as students with special educational needs.

As for higher education sector, the University Grants Committee (UGC) has been supporting e-learning at its eight funded universities. The UGC allocated funding to drive long-term development of virtual teaching and learning during the pandemic. With the advent of generative artificial intelligence, the UGC allocated additional funding in 2023 to support innovative technology in education, which provides an impetus for universities to harness innovative and breakthrough technologies in transforming pedagogies and enriching student learning experiences, and to nurture a digitally competent and technologically responsible generation, for the future success of their students in the digital economy.

4.4 Forging Partnership: Releasing Potentials of Various Stakeholders

Successful digitalization in education is oftentimes realized through collaboration in particular, by releasing and synergizing the potentials of various stakeholders.

Malaysia: Digital Educational Learning Initiative with Multi-stakeholder Approach

The Ministry of Education (MOE) Malaysia introduced the Digital Educational Learning Initiative Malaysia (DELIMa) in July 2019, aiming to revolutionize digital teaching and learning (T&L) practices across the economy. DELIMa caters to the needs of Malaysia's 5.3 million teachers and students, particularly those in rural areas, providing them with access to quality education resources.

DELIMa serves as a comprehensive digital resource center, offering a diverse range of educational materials in interactive formats, including video tutorials, virtual classrooms, and personalized online modules. These resources are developed in collaboration with strategic partners such as Google, Microsoft, and UNICEF, ensuring relevance and quality.

- The initiatives and best practices under the framework of DELIMa include: Tailored Educational Content: DELIMa offers educational video tutorials and online modules aligned with the economy-level syllabus, covering topics such as coding, robotics, AI, and global citizenship.
- Virtual Classrooms and Telepresence Technologies: Students receive DELIMa IDs to access virtual classrooms and connect with teachers and experts worldwide, facilitating specialized instruction and diverse learning experiences.
- Digital Library and Open Educational Resources: DELIMa serves as a digital library, providing free access to textbooks, articles, and multimedia content, bridging the gap in access to learning materials between urban and rural students.

- Educational Technology Tools: DELIMa incorporates simulations, virtual labs, and augmented reality tools to offer immersive learning experiences, enabling students to visualize complex concepts and engage in interactive learning activities.

DELIMa has democratized access to quality education resources, empowering students and teachers economy-wide to explore innovative teaching and learning practices. By breaking down geographical barriers and leveraging technology, DELIMa fosters collaboration, enhances understanding, and promotes digital literacy among Malaysia's education community.

The Republic of the Philippines: Digital Education Initiatives Implemented by Cross-Sector Efforts

Various government agencies in the Philippines are involved in the implementation of digital education initiatives. Key agencies include the Department of Information and Communications Technology, the Department of Education, the Commission on Higher Education, and the Technical Education and Skills Development Authority (TESDA).

Among these agencies, TESDA has developed the TESDA Online Program (TOP), a web-based platform offering free Massive Open Online Courses (MOOCs) to enhance the skills of Filipino workers. With over 150 courses currently available, TOP serves as a valuable resource for vocational education and upskilling. The TOP is accessible through https://e-tesda.gov.ph/.

Additionally, the government has introduced a Biometrics-enabled Scholarship Registration System. This system utilizes facial recognition biometric technology to ensure the integrity of scholarship programs, aligning with approved qualification maps and enhancing registration and attendance processes.

Notably， TESDA Online Program (TOP): TOP offers a diverse range of free MOOCs aimed at upskilling Filipino workers and enhancing vocational education opportunities. Biometrics-enabled Scholarship Registration System: This system utilizes facial recognition technology to enhance the integrity and efficiency of scholarship programs, ensuring adherence to approved qualification maps.

These digital education initiatives aim to bridge skill gaps, promote lifelong learning, and improve access to education and training opportunities for Filipinos. By leveraging technology and innovative solutions, the Philippines is advancing its efforts to empower individuals with the necessary skills for personal and professional development, contributing to economic growth and social advancement.

Part 5: Findings and Discussions

The themes and issues relating to digitalization taken by APEC economies have converged in multiple aspects.

5.1 Findings

A synthesis of the lessons learned has identified the following approaches and strategies proved to be instrumental in ensuring that the process of digital learning was effective and productive for all involved.

- ✧ Adopt a long-term investment strategy for effective digital skills infrastructure development.
- ✧ Develop digitally transform education systems to better prepare children and adolescents for 21st century economies through stronger policies, frameworks and guidelines.
- ✧ Set up a flexible customizable and scalable learning platform accessible online and off-line for children living in hard-to-reach areas and offers a full range of educational content from formal curricula to skills development, across different contexts including formal and informal education settings, and can be delivered in multiple languages and with or without internet connectivity.
- ✧ Create an open education ecosystem making learning materials, data, and educational opportunities available online and ensure access to reliable internet connectivity and devices to all school-aged students.
- ✧ Focus on equitable access and bridge the digital divide, ensures digital learning opportunities of underprivileged students by loaning devices and providing internet access.
- ✧ Improve access to digital resources and digital teaching infrastructure that enables the provision of digital skills by all kinds of education institutions.
- ✧ Employ blended learning models combining online and offline elements, cater to diverse learning styles and ensure continuity of education during disruptions.
- ✧ Create a learning environment conducive to digital skills training through developing a digital skills training system consisting of professional teachers, effective instructional design, a systemic training scheme, digital tools and materials, standardized data collection, and periodic monitoring and evaluation.
- ✧ Develop quality content and engaging and effective digital learning materials ensuring that students remain engaged and motivated in their learning; create high-quality, interactive online learning content that is culturally relevant and caters to diverse learning needs.
- ✧ Enhance teacher training and support teachers to effectively leverage technology in teaching and adapt to new technologies and pedagogies through continuous professional development programs; strengthen digital capacity building of teachers blended with different models of digital skills training and peer mentorship.
- ✧ Introduce, connect and scale quality, inclusive, safe and contextualized digital learning solutions (including low- and no-tech solutions) and content to expand learning opportunities and acquisition of digital skills, especially for the most marginalized.
- ✧ Coordinate the segmented efforts in digital skills development and foster cross-sectoral coordination by a whole-of-government approach.
- ✧ Engage a broader range of stakeholders involved in holistically addressing digital inequalities, recognizing that sometimes solutions to inequalities in digital societies are not digital.

- ✧ Develop partnerships with stakeholders for inclusive digital skills development, engaging industries and businesses in the digital skills development process to ensure the delivery of a comprehensive digitalization plan across all segments of the economy and society.
- ✧ Engage educational technology companies in the development of digital learning materials.
- ✧ Leverage and scale-up digital learning and infrastructure to the most marginalized communities to minimize any existing or potential digital divide and improve equity.
- ✧ Outline a harmonious balance for digital skills development: balance policy development and allocate resource among key elements of plan, infrastructure and education/training.
- ✧ Develop standardized online assessments and effective online assessment tools; explore alternative assessment methods beyond traditional exams.
- ✧ Focus on student well-being in the online learning environment and take measures to address potential issues like screen time management and online safety.
- ✧ Protect data security and privacy with robust data security measures to protect student privacy online.

5.2 Discussion

The economic, social and education development varies across APEC economies. Hence there wouldn't be any one-size-fits-all digital solution. Neither can the aforementioned approaches and strategies be inclusive. The key to the digital transformation lies in an integrated approach that draws on international lessons yet tailor to respective context of each economy. For example, in a multi-cultural context, it is important to embed indigenous knowledge and worldview in digital design and delivery. As the significance of cyber security rise, there is growing need to improve digital services and support for schools and cyber security assurance across all education organizations. Last but not least, an inclusive quality digital education system is premised on cross-sector partnerships, working with diverse stakeholders on building inclusive digital approaches and providing leadership and cohesion for the sector, and adapting to technology suppliers and options are rapidly changing.

Part 6: Recommendations for APEC Economies

As noted by Minister of Education Huai Jinpeng at the 2024 World Digital Education Conference, digital education can be vehicle that brings the humanity into the SEA of future civilization. Inspired by this, we propose a "SEA + 5C" approach for the digital transformation of education for APEC member economies.

6.1 Structure

The structure or structured system consists of policies and networks at different levels that steer, regulate and guide the digital transformation of education:

- Identify current and future trends that can affect digital skills.

- Inventory existing policies and analyze how they can be used to support the goals of the digital strategy.
- Set digital education development vision, goal and objectives.
- Formulate policies with skills targets for formal & non-formal education; baselines, benchmarks; priorities; implementation roles; outcome indicators.
- Set up a trusted data eco-system to help learners, providers, planers make well informed decisions.
- Develop platforms for collaboration with stakeholders including sharing knowledge and best practices.

6.2 Enablers

The enablers make it possible for the digitalization in education to benefit students' learning and realize wellbeing on individual and societal level:

- Commitment: build the commitment to include digital and data considerations throughout the education journey; Engage widely and effectively – emerging trends and technologies can benefit learning and teaching, with expert review, planning and trialing including education providers, technology providers, businesses and communities; Exercise future-focused leadership and collaborate to review, plan and trial emerging technologies; Commit to student wellbeing and address potential issues like screen time management and online safety by implementing appropriate measures.

- Connection: Ensure all students have access to the necessary technology and internet to participate in digital learning; Develop a learning environment conducive to digital skills training and ensure learners of all ages can access; Deliver safe and effective digital services – secure, future-ready digital solutions and accessible, streamlined and cost-effective; Use data to make difference – a trusted data system can shape education for individuals, education organizations and system-wide improvement; design digital identity and deliver sector data framework; Improve cyber security assurance across all education agencies.

- Content: Ensure quality content development; Create engaging, interactive, and culturally relevant online learning materials; Enable educators in formal and non-formal settings have the competencies to integrate technologies in their professional practice; Integrate soft skills and entrepreneurial/business skills development into digital skills; Extend basic, intermediate and advanced digital skills beyond schools; Update 21st century skills and equip students with critical thinking, problem-solving, collaboration, communication, and digital literacy skills – essential for navigating the modern world.

- Coordination: coordinate through a digital skills strategy and framework; Work closely with industry and associations in design and delivery; Develop flexible digital skills trainings per rapid changes; Use a formal coordination body such as a coalition, council, or task force to engage stakeholders; Analyze stakeholders' strengths and weaknesses and identify

their role; Agree on governance and working methods; Adapt programs to meet changing needs.

- Capability/Capacity: Build digital capability in infrastructure, connection and devices; Develop digital skills for teachers and instructors; Improve teacher capability including workforce, initial teacher education, professional development; Integrate digital into curriculum, enabling and transforming learning extending reach; Anticipate emerging technologies such as AI and apply appropriately.

6.3 Accountability

- Target digital assessment – including infrastructure and assessment design.
- Regularly evaluate and refine digital learning programs based on data and feedback from teachers, students, and parents.
- Work with diverse stakeholders on building inclusive digital approaches, including public-private partnerships between governments and educational technology companies.
- Transform learning, teaching, assessment and research by digital and data to lift wellbeing, maximize capability and improve learning outcomes.

Hopefully by prioritizing these areas and working collaboratively, APEC economies can leverage the power of digitalization to create a robust and equitable digital education system for the future.

Annex 1:

Challenges, Opportunities and Trends of Digital Education in Post Pandemic Era

Questionnaire

Economy	
Organization	
Position (Optional)	
Name (Optional)	

1. What are the most pressing issues/key issues for digital transformation of education from the perspective of government in your economy?

A. Innovation in teaching with digital technologies
B. Digital innovation in teacher professional development
C. Digital evaluation and assessment
D. Digitalization in administration and management
E. Digital empowerment of research and development
F. Other (Please specify)

2. What are major digital education platform(s) and/or application(s) that have been developed by the government in your economy? Please give brief introduction.

3. What are high-impact policies, plans and strategies for digital education that have been formulated and implemented in your economy? Please provide relevant documents or websites.

4. Which government department and/or agency is/are responsible for digital education in your economy? Please recommend key informant(s) for interview on digital transformation of education in your economy.

Please provide name, institution, position and email address of the informant(s).

The survey results will be used in the background report entitled “The Digitalization in Education in the Asia-Pacific Region: Policies and Issues” as a collective work of APEC members. All the contributions will be acknowledged appropriately as agreed by contributors.

Thanks for your understanding and support!

Annex 2:

APEC Digital Education Workshop

Challenges, Opportunities and Trends

Agenda

25-27 January 2024 Beijing, China

25 January 2024 (Thursday)	
08:00-09:00	Registration
09:00-09:20	**Welcome and Opening Remarks** Moderator: Dr. Wang Yan *Mr. Han Min, Vice-Present & Secretary General,* *Chinese Society of Educational Development Strategy* *Dr. Zhao Yuchi, APEC HRDWG EDNET Coordinator*
Session 1: Policies and Issues of Digital Education in Asia-Pacific Region	
09:20-09:45	Presentation & Discussion: Background Report "The Digitalization in Education in Asia Pacific Region: Policies and Issues" *Dr. Wang Yan, Project Overseer*
09:45-10:00	Tea Break
Session 2: Challenges of Transformation and Potentials for Collaboration	
10:00-11:00	**Panel Discussion: *What are key challenges in digital transformation of education?*** Moderator: Dr. Wang Yan • Mr. Zhao Yuchi, Executive Director, UNESCO International Research and Training Center for Rural Education; Ms. Fang Yuan'an, Project Coordinator, UNESCO International Research and Training Center for Rural Education • Prof. Peng Liping, Director, International Center for Teacher Education, East China Normal University, China • Prof. MELINDA DELA PEÑA BANDALARIA, Chancellor and Professor, University of the Philippines Open University, the Philippines • Mrs. Tuti ALAWIYAH, Learning Technology Development Expert, Ministry of Education, Culture, Research, and Technology, Indonesia
11:00-12:00	**Panel Discussion: What are the potentials of international cooperation including research collaboration in digital education?** Moderator: Ms. Karen Welsh

	• Mr. Wan Mahadzir bin Wan Ibrahim, Assistant Secretary at the Strategic Planning and International Relations Division, Ministry of Education of Malaysia • Ms. Wang Yi, Deputy Director, Research Division of International Human Resources and International Cooperation, Chinese Academy of Personnel Science, China • Ms. Eliana CHAMIZO, Senior advisor for education and international affairs, Ministry of Education, Chile • Prof. Liu Baocun, Director, Institute of International and Comparative Education, Beijing Normal University, China
12:15-14:00	Lunch Break
Session 3: Solutions and Pathways to Digital Transformation of Education	
14:00-15:30	***Resolving the Challenges: Best Practices and Lessons Learnt*** Moderator: Mr. Wong Teck Kiong • Ms. Karen WELSH, Minister-Counsellor (Education and Research), Department of Education, Australia • Dr. Rosyzie Anna AWG HAJI MOHD APONG, Deputy Dean of School of Digital Science, University Brunei Darussalam • Prof. Yu Shengquan, Professor, Beijing Normal University
15:30-15:45	Tea Break
15:45-16:45	***Resolving the Challenges: Best Practices and Lessons Learnt*** Moderator: Prof. Li Yan • Mr. Martín CÁCERES, Director of the Center of Innovation, Ministry of Education, Chile • Mr. Taufiq DAMARJATI, Curriculum Development Expert, Ministry of Education, Culture, Research, and Technology, Indonesia
26 January 2024 (Friday)	
Session 3: Solutions and Pathways to Digital Transformation of Education (Cont'd)	
09:00-10:30	***Resolving the Challenges: Best Practices and Lessons Learnt*** **Moderator: Mr. Martín Cáceres** • Prof. Dr. Mohamed Ally, Athabasca University, Canada • Dr. D'Andre WEAVER, Chief Digital Equity Officer, Digital Promise Global, the United States • Dr. Kamarul Azman bin Abd Salam, Principal Assistant Director at the Educational Technology and Resources Division, Ministry of Education, Malaysia
10:30-10:45	Tea Break
10:45-12:15	***Resolving the Challenges: Best Practices and Lessons Learnt*** Moderator: Mr. Panthep Larpkesorn • Ms. Wendy Hart, Chief Advisor International Cooperation and Engagement, Ministry of Education, New Zealand • Dr. Ferdinand B. PITAGAN, Director IV, Department of Education, the Philippines

	• Prof. Wu Di, Deputy Director, National Engineering Research Center for E-Learning
12:15-14:00	Lunch Break
14:00-15:30	***Resolving the Challenges: Best Practices and Lessons Learnt*** Moderator: Ms. Eliana Chamizo • Mr. WONG Teck Kiong, Lead Specialist/Technologies for Learning, Ministry of Education, Singapore • Mr. Panthep Larpkesorn, Regional Cooperation Unit Director, Ministry of Education, Thailand • Mr. Tu Do, Director, VTC Digital Education and Training Institute, Viet Nam
Session 4: Beyond APEC: Artificial Intelligence and Digital Learning Future	
15:30-16:00	Moderator: Dr. Wang Yan • Dr. Wayne Holmes, Lead Expert (AI and Education), the Council of Europe
27 January 2024 (Saturday)	
Session 4: Beyond APEC: Artificial Intelligence and Digital Learning Future (Cont'd)	
09:00-10:20	**Update on Research and Development in Digital Education** Moderator: Ms. Fadzliaton binti Zainudin • Mr. Shahbaz Khan, Director of the UNESCO Office in Beijing • Ms. Antonia Mandry, Education Specialist, Unicef East Asia and Pacific Regional Office • Ms. Xiao Liping, Senior Education Specialist, World Bank Office in Beijing
10:20-10:40	Tea Break
Session 5: Developing Knowledge Product for Common Good	
10:40-12:00	**Panel Discussion: analysing developmental trends of digital education** Moderator: Mr. Han Min • Prof. Wang Qiong, Professor, Graduate School of Education, Peking University • Prof. Li Yan, Director, Research Center of AI in Education, Zhejiang University Discussion
12:00-14:00	Lunch Break
14:00-15:20	**Panel Discussion: identifying areas of action and generating policy recommendations** Moderator: Mr. Han Min • Prof. Wang Dinghua, President, Beijing Foreign Studies University • Ms. Fadzliaton binti Zainudin, Principal Assistant Director at Educational Technology and Resources Division, Ministry of Education, Malaysia Discussion
15:20-15:30	Tea Break

Session 6: Challenges, Opportunities and Trends of Digitalization in Education	
15:30-17:00	Presentation on the framework of the final report (6 speakers/chapter authors, each present for 15 minutes) *Dr. Wang Yan, Mr. Martín CÁCERES, Prof. Li Yan,* *Prof. Yu Shengquan, Ms. Fadzliaton binti Zainudin,*
17:00-17:30	Summary with takeaway for participants and follow-up *Dr. Wang Yan & Mr. Han Min, Project Overseer*