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POLICY BRIEF

Digital transformation in education in Asia Pacific

Introduction

Digital transformation in education envisions the progressive use of information and communications technology (ICT) for enhancing teaching and learning and for mainstreaming of technology-enabled education systems. When appropriately steered, the use of technology can support more inclusive education, expand access to information and knowledge, enrich educational processes and improve learning outcomes (UNESCO, 2021). In the education response to the COVID-19 pandemic, ICT has been further recognized as a tool that can provide continued access to quality education during periods of disruption and school closures, and for identifying and implementing transformative ways of learning. Building on this momentum, this policy brief explores how digital transformation in education can support the learning recovery and transformation of education systems to increase the relevance, efficiency, inclusion, resilience and quality of education delivery.

Key challenges and issues facing digital transformation in Asia-Pacific

This section highlights the major challenges facing digital transformation in education in the Asia-Pacific region, with particular focus on issues that were experienced during the COVID-19 pandemic:

Exacerbated learning losses for students most affected by the digital divide

Lack of connectivity, devices, relevant skills, parental learning support and access to technological resources have excluded a large portion of marginalized and disadvantaged students from the remote and digital learning opportunities provided during the pandemic. For example, in South Asia, just 13 per cent of children and young people have access to the Internet at home (UNICEF and ITU, 2020). Even where students have nominal access to the Internet, the quality of connection is often inadequate for online-based teaching and learning. Moreover, the use of lower-technology distance learning has not been able to reach all learners. Over a third of low- and lower-middle-income countries reported that lessons broadcast on television or radio reached less than half of the intended recipients among primary school students (UNICEF, 2020). While learning support from parents is highly important to the quality of remote and online learning, parents of low-income households often lack the digital skills to provide the necessary learning support to their children. Furthermore, learners with disabilities or special needs who require additional social and special education support have not been able to receive it through online learning (UNICEF, 2021a).

Low level of relevant ICT and pedagogical skills among teachers

Inadequate digital competencies consistently rank as the single greatest barrier for teachers to use technology effectively for teaching, and this is true regardless of a country's development status (UNESCO, 2021). Particularly, teachers have not been provided adequate support and opportunities to develop the ICT and pedagogical competencies required. For instance, while in Thailand and Singapore close to all teachers have at least basic digital skills, in countries such as Kyrgyzstan, Malaysia, and the Philippines, fewer than 5 per cent of teachers reported the same (UNESCO, 2018).

Inadequate and unequal access to ICT connectivity and devices

Large divides exist between countries in the region, with internet usage rates ranging from more than 90 per cent in the advanced economies to less than 15 per cent in the region's least developed economies (ITU, 2021). Furthermore, these areas may also lack reliable access to electricity to support the usage of ICT in teaching and learning (UNESCO, 2018). Typically, schools with adequate access to the internet and computers are concentrated in high-income countries and within urban city centres (UNESCO & UNICEF, 2021a). Considerable divides also exist within countries, tending to trace existing lines of inequality, including social and economic status, gender and geography. For example, those living in rural areas have less access to the internet with only 37 per cent of people in rural areas, compared with 70.4 per cent in urban areas (ITU, 2021).

Limited policy guidance for ICT in education and digital learning

There is a lack of policy guidance from government that is necessary to support and align digital transformation efforts across levels (national, sub-national, and local levels) on the one hand and across different sectors on the other. This includes coordination related to funding, legislative and regulatory frameworks, as well as public investment. While 50 per cent of high-income countries in the region have an operational policy on digital remote learning, only 27 per cent of low- and lower-middle-income countries do so (UNESCO, 2018).

Constrained funding for education

Education financing gaps are predicted to increase in two-thirds of low- and lower-middle income countries, which will affect already limited funds available for existing education service provision (World Bank, 2021). Meanwhile, it is estimated that universalizing digital learning in low- and lower-middle-income countries will require US\$200 billion in additional funds annually (UNICEF, 2021b). During the response to the pandemic, only a quarter of low-income countries allocated regular or extra expenditure to digital remote learning, while almost all high-income countries did so.

Low capacity and lack of tools to monitor education interventions

Many countries lack the proper systems and capacity to monitor students' learning and to target ICT interventions, particularly for marginalized students (UNESCO & UNICEF, 2021b). This is further linked to the capacity of systems to monitor other related factors such as student retention, teacher preparedness, and learning assessments. During the pandemic, the lack of disaggregated data on which children were accessing remote and digital learning opportunities also restricted governments' abilities to plan and adapt their responses.

Increased risks and threats related to online safety, privacy, and mental health

The impact of the COVID-19 pandemic added to the trend of children spending more time online and interacting digitally, which exposes them to increased risks linked to cybersecurity, cyber safety, and issues of privacy and data ownership (End Violence Against Children, 2020). It has also been found that remote learning during the pandemic led to increased mental health issues and an increased sense of isolation among students, and so this must also be addressed in any digital learning strategy (Malolos et al., 2021; UNESCO & UNICEF, 2021a).

Challenges to leveraging the capacities of the private sector while protecting education as a basic human right and a public good

While engagement with the private sector can lead to more innovation to support digital transformation, the challenge is to balance business profit-oriented objectives with ensuring that digital learning remains a public good. The UN Special Rapporteur pointed out concerns about the increasing influence and role of private technology companies in terms of ownership of users' data and protection of their rights (United Nations, 2019). Digital platforms and applications have their own private governance systems, which can weaken public and state authorities.

Key priority areas for digital transformation in education

Key priority areas for learning recovery

In the learning recovery phase, digital technology should be integrated into programmes to provide students with tailored and sustained support to help them re-adjust and recover from learning losses (UNESCO, UNICEF & World Bank, 2021). It is urgent to expand access to quality digital and blended learning which complements and expands school-based learning opportunities. To leverage digital technology for immediate learning recovery and to build the foundations for digital transformation, priority areas include:

1. Teacher support for technology-enabled teaching

Support for teachers should be focused on assisting their assessment of students' learning and helping them to cater their instruction to students' learning levels. This should include teacher training on ICT competencies, assessment and ICT-integrated pedagogical skills to implement accelerated curricula and differentiated learning strategies (United Nations, 2020a). Furthermore, appropriate support mechanisms should be implemented to promote peer-learning, collaboration and sharing amongst teachers. Meanwhile, the provision of structured pedagogy and guidance for teachers has proved useful and cost-effective in supporting students to recover from learning losses (Global Education Evidence Advisory Panel, 2022).

2. Accessible and free learning content contextualized for all learners

It is critical to develop high quality, free, and age-appropriate learning content that can be adapted to reach students with existing technology and infrastructure. This includes investing in open educational resources (OER) and a comprehensive suite of learning content that is aligned with the national curriculum, is adaptable to different modes of education delivery, and takes into account diversity in terms of gender, culture, and language, and the needs of learners with disabilities. Furthermore, this should be supported by adequate hardware, software, capacity building and technology infrastructure.

3. Meaningful connectivity and devices for all

Provision of access to meaningful connectivity and devices (Alliance for Affordable Internet, 2022) is required to ensure that all learners can meaningfully participate in technology-enabled learning. This requires investments in infrastructure, provision of subsidized devices and additional measures such as financial support, while being conscious that they do not divert funds from main education provision. Following the principle of 'progressive universalism', investments in school connectivity and devices should focus on marginalized groups to decrease the gaps and mitigate compounded disadvantages due to the COVID-19 pandemic. Alternative financing mechanisms such as equity-based funding should be used to provide supplementary financial resources to marginalized schools (UNESCO, 2021; Save our Future, 2020). Furthermore, partnerships should be built at both national and community levels to reduce costs, promote local ownership and strengthen the sustainability of such programmes.

4. Support for safe and effective learning in technology-enabled education

Governments should take the necessary precautions towards expanding technology-enabled learning by establishing safeguards to provide a safe and empowering online environment for learners. This includes the ownership and use of data, user privacy, as well as ethical use of education technologies. For example, the Child Online Protection (COP) Guidelines provide a comprehensive framework to guide policymakers and relevant stakeholders (ITU, 2022). Furthermore, teachers and learners should be equipped with the essential digital competencies to stay safe online and to take advantage of the opportunities of technology-enabled learning, with emphasis to reach underprivileged

populations, including rural children and adolescents, out of school children, and girls and young women.

5. Community and family support

Parents, family and community members should be supported to take an active role in children's learning, particularly as additional support is needed in the learning recovery. To achieve this, digital technologies can enable schools to strengthen engagement with families and community groups, such as to reinforce students to return to classrooms, to promote enthusiasm for learning, and potentially lead to the development of flexible community-supported education programmes.

Key priority areas for transforming education and its systems

Digital transformation of education systems should contribute to accelerating progress towards the commitments of the 2030 Agenda for Sustainable Development and lay foundations for deeper transformations that will strengthen education. The RewirEd Global Declaration on Connectivity for Education commits to three core principles: center on the most marginalized, expand investments in free and high-quality digital education content, and move education to digital spaces through pedagogical innovation and change (UNESCO, 2021). Priorities should be made to operationalize these principles while building on the foundations for learning recovery to support deeper transformation of education systems. These include:

1. Pedagogical innovation enabled by technology

Digital technologies can foster new and effective pedagogies that can expand learning opportunities, enable more flexible learning and personalized learning, and strengthen teachers' and learners' agency to improve the quality of education. This should be supported by the development of comprehensive learning resources (such as digital platforms, protocols, and support for online teaching and learning) and development of appropriate curriculum, pedagogy and assessment tailored for blended and digital learning.

2. Systemic capacity development of education personnel

Comprehensive education and training for education personnel (including teachers, teacher educators and school leaders) is required for the facilitation of digital transformation. This should be guided by relevant frameworks, standards and guidelines that are incorporated into the relevant education and training processes. For teachers, this includes the development of digital competencies and pedagogies, which should be supported by adequate systems for motivation, recognition, monitoring, assessment and compensation. Meanwhile, the capacity of school leaders and other stakeholders should be developed to enable them to use digital tools for school management and to implement digital transformation programmes.

3. Digital transformation policy and regulation

Coordinated efforts and high-level commitment are needed to anchor digital transformation as a priority across government ministries. This should be supported through mechanisms for intersectoral collaborations, development of joint strategies and plans, and mobilization of necessary funding and resources. At the same time, technology is constantly changing and evolving at a rapid pace, policies and regulations should be developed to govern the development and use of technologies (including data use and AI) in education systems and to ensure principles of digital inclusion (UNESCO, 2022).

4. Partnerships for public good

Collaborations and partnerships at the international, national and local levels need to be developed to promote sharing of knowledge, contents, and resources to support digital transformation initiatives. This should be guided by appropriate governance mechanisms to affirm public value and protect education as a public good. Partnerships should include a focus on building accountability, equity, sustainability, and technical openness so that governments do not become constrained to the proprietary and closed systems of technology providers. The development of multi-sectorial and whole-of-society approaches can be guided by the UN Secretary General's Roadmap for Digital Cooperation (United Nations, 2020b).

5. Monitoring and reliable data for effective governance

A consistent and transparent monitoring and evaluation system is integral for ensuring effective governance of digital transformation programmes. Education systems should strengthen capacity to gather disaggregated real-time data, conduct data analytics, and make use of technologies such as big data and artificial intelligence (AI) to help improve teaching and learning. This includes strengthening of information systems such (e.g. EMIS, LMS, etc.) to inform the appropriate provision of interventions and trainings (ITU, UNESCO & UNICEF, 2020) as well as to enable automation, track learning outcomes, and improve responses. This also requires collaboration between multiple stakeholders for the development of frameworks and principles to ensure reliable data.

6. Digital citizenship education

As use of the Internet and technology expands through education and beyond, it is important that the possible negative impacts on students and teachers be thoroughly investigated and mitigated. At the same time, efforts should be made to empower users to flourish in the quickly evolving digital world as digital citizens, with education for the safe, ethical and meaningful use of technologies. This includes the use and analysis of digital resources, media and information, as well as building independent learning skills, supporting learners' wellbeing in distance learning and promoting global citizenship education.

Policy pointers

The policy pointers adopt a system perspective in order to meet the complexity of digital transformation and to consider the interdependencies among the education systems' constituent parts. Based on the priorities areas outlined above, the following policy pointers focus on the role of national governments in coordinating and empowering education system actors to advance the digital transformation of education, in the immediate term to support *learning recovery*, and in the medium to long-term to promote *education system transformation*:

| Key priority | System level | School and student level |
|--|--|--|
| Immediate actions for the learning recovery | | |
| Teacher support | <ul style="list-style-type: none"> Provide teacher capacity development on digital skills, appropriate ICT-integrated pedagogy for remote and blended teaching, and differentiated instruction supported by ICT. | <ul style="list-style-type: none"> Promote school-centred collaborative approaches to teacher professional development for and with the use of digital technologies. |
| Learning content | <ul style="list-style-type: none"> Develop comprehensive suite of curriculum-aligned adaptable learning content and OERs that are inclusive of gender, language, and needs of all learners. | |
| Meaningful connectivity and devices | <ul style="list-style-type: none"> Prioritize and invest in connecting schools with meaningful connectivity and devices, in particular for the most marginalized and disadvantaged learners, remote areas and SIDS; Supplementary financial resources should be allocated through equity-based funding. | <ul style="list-style-type: none"> Provide subsidized internet access and devices (including assistive technologies, for instance related to hearing and sight disabilities) for disadvantaged households, girls, and learners with disabilities. |
| Safe online learning environment | <ul style="list-style-type: none"> Establish safeguards in digital learning platforms and processes to protect teachers' and learners' privacy and data. | |
| Community and family support | <ul style="list-style-type: none"> Empower parents, caregivers, and community members with knowledge and skills to support the transition to blended and digital learning. | <ul style="list-style-type: none"> Raise awareness on blended and digital learning, including student well-being, mental health and safe online behaviour. |
| Medium to long-term transformation of education | | |
| Pedagogical innovation | <ul style="list-style-type: none"> Leverage digital technologies to adapt or develop learning resources (such as digital platforms, contents and protocols) supported by appropriate curriculum, pedagogy and assessment tailored for blended and digital learning. | <ul style="list-style-type: none"> Empower and encourage schools to develop inclusive digital ecosystems to support hybrid learning processes both in school and at home. |

| Key priority | System level | School and student level |
|--|--|--|
| Capacity development for education personnel | <ul style="list-style-type: none"> Provide comprehensive education and training for education personnel (including teachers, teacher educators and school leaders) on digital transformation, guided by relevant frameworks and standards that are adaptable to the evolving use of technologies in education; | <ul style="list-style-type: none"> Establish physical and digital learning spaces for supporting teachers to develop pedagogical innovations and engage in professional development. |
| Policy and regulation | <ul style="list-style-type: none"> Develop coherent and costed policies for integration of technology in education which are aligned with education sector plans and broader national digital transformation and ICT policies, and which have digital inclusion as a key principle. | <ul style="list-style-type: none"> Provide school guidelines for procurement of connectivity, devices, and other ICT in education resources. |
| Partnerships and collaboration | <ul style="list-style-type: none"> Scale up long-term public-private partnerships to expand access to connectivity and devices in schools and homes, while being mindful of ensuring equitable access, public accountability and sustainability. | |
| Monitoring and governance | <ul style="list-style-type: none"> Invest in capacity development and monitoring systems (such as EMIS and LMS) to strengthen ability to track ICT-related implementation and student learning, disaggregated by exclusion factors. This should be supported by relevant frameworks to guide the appropriate usage, sharing and governance of data. | |
| Digital citizenship education | <ul style="list-style-type: none"> Integrate digital citizenship education in curriculum to promote safe, ethical, and meaningful use of digital technology adapted to students' skills and needs. | <ul style="list-style-type: none"> Provide opportunities for children and young people to develop digital skills, inside and outside school – including in the classroom, through clubs, linkages with local private sector, in the community |

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Education is UNESCO's top priority because it is a basic human right and the foundation for peace and sustainable development. UNESCO is the United Nations' specialized agency for education, providing global and regional leadership to drive progress, strengthening the resilience and capacity of national systems to serve all learners. UNESCO also leads efforts to respond to contemporary global challenges through transformative learning, with special focus on gender equality and Africa across all actions.



The Global Education 2030 Agenda

UNESCO, as the United Nations' specialized agency for education, is entrusted to lead and coordinate the Education 2030 Agenda, which is part of a global movement to eradicate poverty through 17 Sustainable Development Goals by 2030. Education, essential to achieve all of these goals, has its own dedicated Goal 4, which aims to *"ensure inclusive and equitable quality education and promote lifelong learning opportunities for all."* The Education 2030 Framework for Action provides guidance for the implementation of this ambitious goal and commitments.



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