Digital Technologies in Education

Opinion Piece

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Education as we know it might soon become obsolete. Ensuring that education systems remain relevant and responsive to the dynamic local conditions of students and their needs has put a growing drive to challenge traditional teaching methods, curricula and pedagogical strategies at the top of the agenda (UNESCO, 2022; 2021). Revising the content taught in school is equally as important as examining how students are learning. This was confirmed by the vast majority of countries during the 2022 Transforming Education Summit, where 69% cited the need to rethink curriculum content and methods to improve learning. A vast majority of countries attending the summit (90%) also raised concerns about digital learning aspects, such as connectivity gaps, access to free digital learning contents, and the need for strengthening populations' digital skills (UNESCO, 2022). This piece reflects on the promising role digital technologies play in the learning process and the need for a multistakeholder approach to harness the potential of the integration of technologies in education.

WHAT ARE STUDENTS LEARNING?

While there is common consensus on the importance of acquiring demonstrable skills through the education system, approximately half of the students who have graduated high school worldwide have not obtained minimum basic competencies (UNESCO, 2022; 2021). Similarly, close to 60% of youth globally do not possess minimal proficiency levels in reading and math (UIS, 2017). Such alarming circumstances have given rise to extensive discussions about the potential of digital education strategies to improve the qual-ity of learning (Hollow & Jefferies, 2022; Haleem et. al., 2022). Students are also failing to gain other relevant skills, such as communication, critical thinking, and cultural connectivity (Epicedu, 2020), and other context-relevant subjects related to citizens' local or national challenges (World Economic Forum, 2020).

While country-relevant abilities help students face structural problems such as violence, machismo or corruption, forward-looking skills prepare students for upcoming challenges and equip them with tools to foster a sustainable future for all (D. Castillo, F. Ripani, S. Cueto, personal communication, March 1 and 16, 2023). Take as an example the Fourth Industrial Revolution (4IR), which is changing the way society lives and works (Khatun & Saddat, 2020). The 4IR is at the root of structural transformations, thus affecting the labor market and the skills workers require to thrive (Autor & Salomons, 2018). Education is pivotal in supporting the workforce to gain the right skills and remain relevant amidst changing labor market demands. Skills such as creative problem-solving and continuous learning seem crucial (Duyar, Mina, & Owoh, 2019; D. Castillo, F. Ripani & S. Cueto, personal communications, March 1 and 16, 2023), yet are not a priority in schools' curricula. The achievement of the 2030 Agenda also helps to illustrate the need for prioritizing new learning outcomes. Society can certainly benefit from new generations who relate differently to the environment, the planet and other human beings (UNESCO, 2021). Failing to consider these aspects when rethinking school curricula perpetuates an obsolete education system.

WHAT IS THE ROLE OF DIGITAL TECHNOLOGIES IN EDUCATION?

While the use of digital technologies in education is not new, it has grown exponentially since the pandemic outbreak (Sotiriou & Giovanardi, 2021; OECD, 2020). This sudden shift to virtual education made society more aware of technologies' remarkable potential in education as well as their limitations. Challenges that came along with large-scale implementation included a lack of digital infrastructure, access to devices, and digital skills of students and teachers, particularly in the Global South (Tadesse & Muluye, 2020).

> **»Rethinking what is taught is equally as important as rethinking how students are learning.«**

While connectivity and infrastructure challenges are pressing, not enough has been said about how technologies can help students gain emotional and social skills, such as curiosity, compassion, or courage (OECD, 2022). Some have questioned whether digital learning can in fact support the development of "life skills" such as bravery, confidence, entrepreneurship, and kindness (Pereira et al., 2022). It is still uncertain whether digital technologies improve collaboration and care for each other, or foster empathy. As important as it is to recognize the role of technology, the role of teachers, families and other fellow students is and will remain crucial. Worldwide school closures during the COVID-19 pandemic evidenced the shortcomings of replacing schools with virtual spaces, even in countries with relatively equitable connectivity and access to digital technologies (UNESCO, 2021). There is a social aspect in the learning process that cannot be neglected. After all, learning is a shared activity (Darling-Hammond et al., 2019).

HARNESSING THE POTENTIAL OF DIGITAL TECHNOLOGIES IN EDUCATION

Digital technologies and education are two complex systems that are different in nature. Defining how both function and relate to one another is vital in understanding how they can best support learning. On the one hand, education often depends on complex political processes, which makes it stiff and adjustments slow. Democratic and inclusive decision-making driving new education policies and agendas often involves lengthy, but necessary, deliberations among multiple actors at various levels. Similarly, public education institutions rely on the state's funding and welfare measures to act. Conversely, digital technologies are flexible, adaptive, and constantly changing. The private sector primarily drives its evolution, following a market-oriented logic. Continuously creating, engineering, and innovating is embedded in its very nature. These different dynamics between both systems must be well understood to harness the potential of integrating digital technologies into education.

The continuously innovative nature of digital technologies and the rigidity of the education system are both barriers to their integration. In particular, the gaps digital technologies are creating in acquiring skills relevant for the future are difficult to address. It seems that, as technological advancement accelerates, learning inequality continues to expand (S. Cueto, D. Castillo and F. Ripani, personal communication, March 1 and 16, 2023). For instance, an often-cited benefit of digitally enabled education is that it can reach remote areas or excluded students through distance learning (Hallem et al., 2022). Not only does this depend on the digital uptake of students in remote areas, but there is no conclusive evidence on the impacts of online learning in promoting equity in quality education. Another challenge in harnessing the potential of these systems is to uphold diversity, multiple ways of knowing, interculturality and solidarity in learning (UNESCO, 2021), which demand soft and interpersonal skills, and which go against digital technologies' tendency toward standardization.

VARIOUS STAKEHOLDERS, ONE GOAL

Digital transformations are systemic processes that embed adjustments in technological, cultural and institutional aspects (Cerda et. al., 2021), and comprise a range of actors in this ecosystem. Therefore, harnessing the potential of digital technologies in education demands a multistakeholder approach in which the government, the private sector, and society all play a central role. While the government takes the lead in putting the necessary policies and regulations into place, the private sector should work toward reconciling innovation with education's social objectives and committing to transparency and accountability practices. Families, as representatives of society, are also pivotal in determining who and how students can benefit from digital technologies.

THE ROLE OF THE GOVERNMENT

The government has the enormous responsibility of leading the digital transformation of education and steering it toward public interests (Langthaler, 2020). One of its core tasks is to ensure that the agendas of different members of the digital education ecosystem are in sync with national priorities and development needs and strategies. Given that the private sector leads innovation in technologies for education, an important role of the government is to take a leading role in public-private partnerships for education.

> **»Digital technologies and education are two complex systems different in nature.«**

The government also needs to ensure that technologically driven education is based on the logic of "common goods" and a human rights approach, so that it can secure free, public and quality education for all (UNESCO, 2021; D. Castillo, F. Ripani, S. Cueto, personal communications, March 1 and 16, 2023). The only way to guarantee this right to education is by making sure that digitalization of education does not exacerbate existing inequalities and negatively affect the most vulnerable. To do

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this, the government can enforce control measures to mitigate the risks of reproducing stereotyping, bias, and racism in digital platforms, as well as regulate how data on education is produced and used for decision-making processes (UNESCO, 2021).

THE ROLE OF THE PRIVATE SECTOR

Private actors gained increased momentum in digital education during the pandemic and will have a growing role in the years ahead (Sotiriou & Giovanardi, 2021; Charvet & García, 2022). With digital technologies becoming key platforms for learning, tech companies are assuming a crucial role as intermediaries in delivering quality education for all (UNESCO, 2021). As intermediaries, companies ideally reconcile innovation with the social and sustainable objectives of education, while aligning digital education services with current and future labor skills demands.

The tech industry can support the state in developing digital transformation strategies and help to fill in some of the gaps that countries face in reconfiguring education. For instance, online education companies can complement the state's

upskilling and lifelong learning programs by offering short, flexible courses (Sotiriou & Giovanardi, 2021). Infrastructure and internet service providers can promote access to online education, for example by lowering costs in digitally excluded areas (Kundu & Ambast, 2022; Barrantes, Burneo & Duffó, 2022; D. Castillo, F. Ripani, S. Cueto, personal communications, March 1 and 16, 2023). Simultaneously, companies must take the lead in committing to transparency and accountability practices. Ethical practices such as anonymizing students' and teachers' personal data (UNESCO, 2022), information sharing among sectors, and democratizing the contents of education to uphold academic freedom must prevail.

THE ROLE OF FAMILIES AND CIVIL SOCIETY

Family, as a primary social group, plays a central role in harnessing the potential of digital technologies in education. Parents determine individual opportunities to benefit from digital learning because their beliefs and perceptions about digital technologies – their purpose, safety, or usefulness – define the household rules about who uses them, for how long and under what conditions. Older boys own and use digital tools more often than girls, who often experience greater surveillance, control, and restrictions (Kundu & Ambast, 2022; Barrantes, Burneo & Duffó, 2022). Findings from case studies conducted in India, Tanzania and Peru report that the internet is often perceived as unsafe, inadequate, or unsuitable for women and girls. (Southern Voice & Centre for Budget and Governance Accountability, 2022: Southern Voice & Institute of Peruvian Studies,

2022; Kundu & Ambast, 2022; Barrantes, Burneo & Duffó, 2022). If perceived as a threat rather than an opportunity for collaboration and expansion of knowledge, both children and adults may have less openness to learning, creating, and interacting through digital education platforms.

»Harnessing the potential of digital technologies in education demands a multistakeholder approach.«

Similarly, parents with low digital uptake or a traditional view of the classroom may, for instance, be more reluctant to see the value in interactive or gamified education platforms. A key challenge pointed out by one of our interviewees is that twenty-first century parents must understand that education without digital skills is incomplete, and that these are both a goal and a resource (S. Cueto, personal communication, March 1, 2023). This is fundamental because the possibility of harnessing digital technologies to address some of education's shortcomings requires complex digital skills development, which is dependent on the sustained use of, and exposure to, technologies.

RECOMMENDATIONS

Harnessing the potential of digital technologies in education at the national and global levels calls for reflections on:

- The nature of both systems, digital technologies and education. While the first is constantly changing, the second is slower and takes more time to catch up.
- How are digital technologies supporting students to be better prepared for future challenges?
- What context-relevant and forward-looking skills do students need to learn?
- What are the elements mediating the relationship between digital technologies and education?
- What are the roles each actor plays in successfully integrating digital technologies and education?

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