

How to bridge the digital divide on education

THE FUTURE OF LEARNING



The world is changing. Teaching and learning are completely different today than they were a decade ago. Technology changes by the minute and it is particularly important to prepare the students for this ever-changing world. Despite the positive trends towards adopting technology in the classroom, the full menu is still not universally available to all students. Nowhere is the 'digital divide' more evident than in K-12 education, particularly in the emerging countries where infrastructure and connectivity are still precious resources - and the COVID-19 pandemic left these vulnerabilities of the educational sector even more exposed.

According to the report from the Partnership on Measuring ICT for Development and the International Telecommunication Union (ITU), is that, when it comes to schools, "while Internet access has been universally achieved in the majority of European and other OCED countries, Internet connectivity is lagging behind in most developing countries. It remains under 10 per cent in some countries from all developing regions, including Latin America and the Caribbean, Asia, and Africa... Analysis has shown that while countries may have some success in building a computer infrastructure, connecting these devices to the Internet may lag behind."

While in most developed countries schools have wireless, high-speed digital networks and students either own their own computers or have access to the Internet outside of school hours, in contrast, in some developing countries, millions of students undergo schooling in challenging environments, without access to technology and lack of connectivity. This creates a huge disparity between them: those who can access the Internet have an unfair competitive advantage over those who don't, having access to the latest technology and the best available learning aids. As a result, they have a better opportunity to achieve excellence in education and it can be reflected in their future professional lives. Were also these students who, during the lockdown, felt the least impact on learning since they were already familiar with the technology in a classroom context.



However, and despite of COVID-19 has been brought to the fore how precarious access to ICTs is in many parts of the world, closing the Digital Divide is not a recent concern.

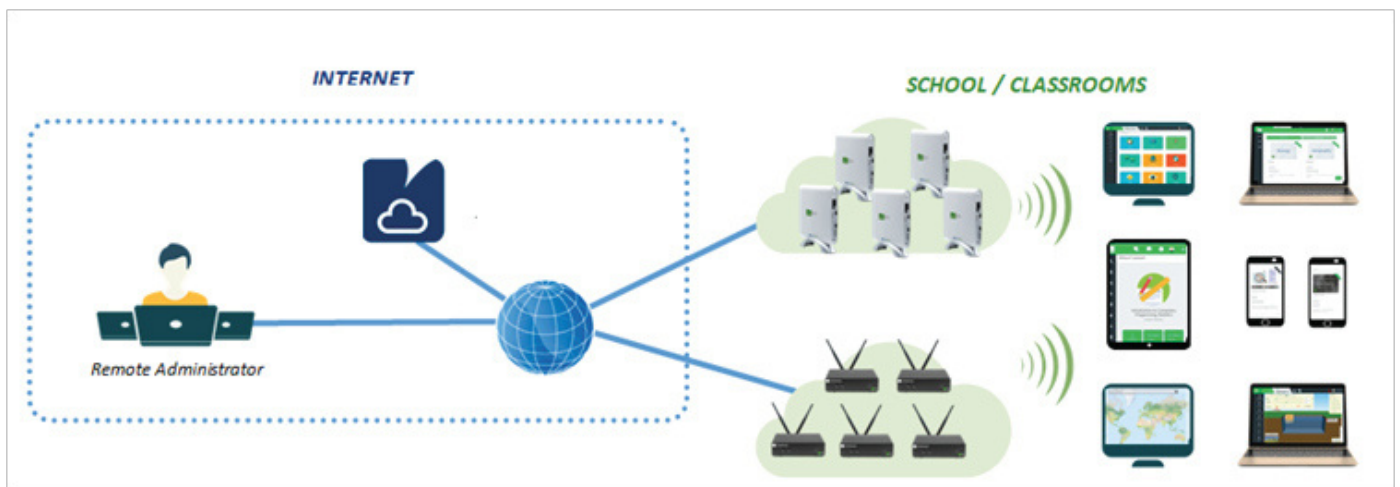
On the latest years, in many cases, the government entities have tried to enable the education, possibly with 3G or 4G - but even that connectivity struggles to provide a solid foundation for learning, as usage and demand have grown faster than connection speeds.

Consider the case of 4G wireless in a country such as India. According to research published by Quartz, the average 4G LTE speed is 5 - 6Mbps. While that might sound strong, consider that a single YouTube video in 720P can take almost 1.5Mbps; this means that three students attempting to better their learning with a video lesson can bring the entire school to its knees. In regions like this, even if tech giants donate equipment or ministries of education allocate significant funding, students are too often cut off from the cloud-based learning resources enjoyed in the more developed world due to lack of regular or robust connectivity, or other infrastructure limitations such as power outages and fluctuations.

To combat this global problem, industry leaders are driving an innovative new technology architecture - known as micro-cloud learning environment - that allows globalizing learning on a local level, even in these infrastructure-challenged environments. A micro-cloud is a completely self-contained but cloud-enabled e-Learning environment that allows students and teachers access to cloud-based learning management systems, curriculum, content, and resources - even when the school has no connectivity or power. With this approach, the learning infrastructure, as well as the curriculum, content, and resources are staged on the micro-cloud platform in the school. Students connect on a local Wi-Fi that appears to be an internet connection, hence the ability to use a cloud-based e-Learning paradigm even if there is no internet connection or even without power.



Valuable incremental resources (such as YouTube videos, simulations, interactive maps, learning games, educational apps, Wikipedia content, etc.) are housed locally in the micro-cloud. In this scenario, students' progress through the learning process even if there is no internet connectivity to the school at any point in time. Most importantly, hundreds or even thousands of micro-clouds throughout the region/country can be managed and administered from a single, centralized point. The administration of the Ministry of Education can curate uniform curriculum and content, which is then populated to the micro-clouds whenever a sporadic connection becomes available.



Micro-clouds have been adopted as the best solution to ensure continuity learning after school closures caused by COVID-19, by creating a learning environment that blends at-home, hybrid, and return-to school into a single experience. Students can benefit from a rapid deployment of e-Learning environment that can be moved to home if needed, ensuring a minimum disruption in the learning process. Also, that enables students goes to schools in a rotation model (not all at the same time). They can have access to e-Learning at school and download to their device activities and tasks for the week, and then go back home to work on those activities.

Interruptions to education can have long term consequences, especially for the most vulnerable, who are more likely to be exposed to risks like child labor, or family violence. o education is as limited as possible. This is the opportunity to rethink and revamp the educational sector: How can we ensure that interruption to learning is as limited as possible? How can we prepare our schools - and our students - for this new learning reality? How can we prepare the education sector if we have to go through a pandemic again? What should learning look like for future generations? One thing is for sure - now is the time to prioritize students and closing the digital divide is more necessary than ever.

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Bruno.ambrosio@critical-links.com