Policy brief

Alternative technologies in public education systems: a possible transformation

Cases from Brazil, the United States of America, Spain and Mexico show how free and open technologies can be part of the pedagogical process, contribute to closing digital gaps, fostering digital democratization, and promoting the realization of the right to education.

By: Campaña Latinoamericana por el Derecho a la Educación | ReLAAPPe

With the suport of: EDUCATIONOUTLOUD advocacy & social accountability | GPE Transforming Education

Technologies in education have proliferated in recent years, impacting classrooms, school management, student performance evaluation and beyond. Despite inequalities between and within countries, in 2022, according to the International Telecommunication Union, 50% of secondary schools worldwide had used the internet for educational purposes.

Especially during the COVID-19 pandemic, due to the urgent need to avoid gaps in the trajectories of one billion students, there was significant pressure from private actors and their investors to quickly and extensively adopt technological solutions, almost always developed by huge corporations (World Bank, UNESCO and UNICEF; 2021[1]).

It is urgent to identify, disseminate and replicate critical and creative uses of technologies in pedagogical processes, which can transform students and teachers into protagonists of the development of collaborative, free and democratic technologies. Therefore, between October 2023 and March 2024, the Latin American Campaign for the Right to Education (CLADE) and members of the Latin American and African Network of Researchers on the Privatization of Education (ReLAAPPe) developed the study *"Free digital technologies in public education systems: mapping experiences to inspire another possible education"*.

Based on a conceptual matrix built on the right to education normative, the research sought to analyze to what extent five cases of open and free digital technologies in public basic education respond to the dimensions of this right (availability; accessibility; acceptability; adaptability and accountability), hereinafter referred to as "5As". The cases, from Brazil, Spain, the United States and Mexico, challenge the hegemony of corporate digital platforms.

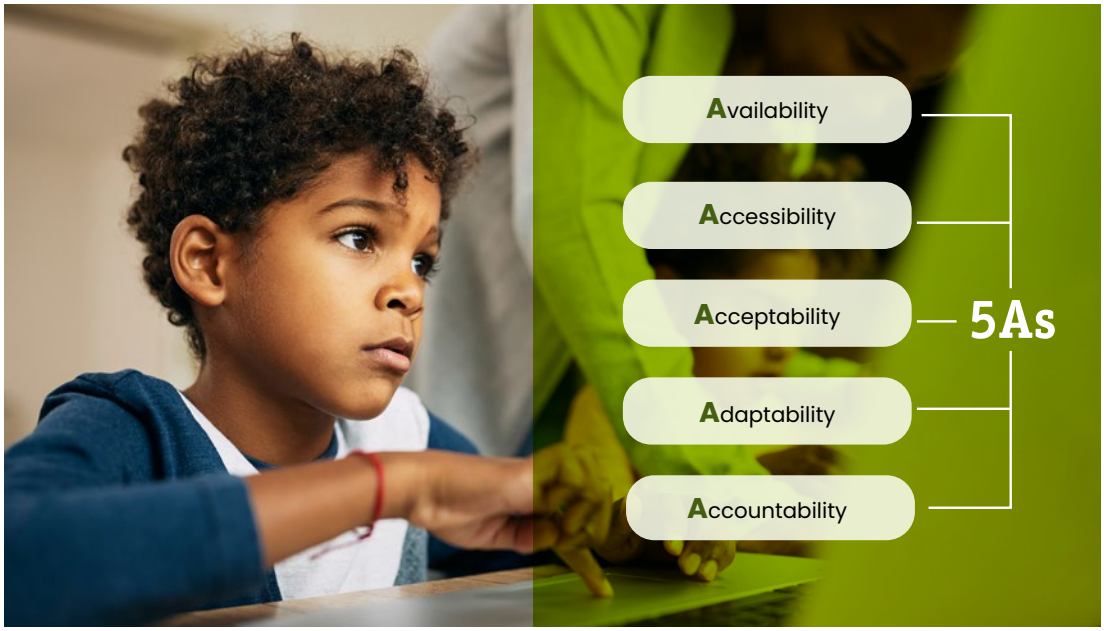

Foto: @Drazen Zigic

The following are the main findings of the study, based on documentary analysis of institutional websites, publications, and consultations with informants.

1. *The state of the global education crisis: a path to recovery*. Available at: unicef.org/media/111621/file/%20The%20State%20of%20the%20Global%20Education%20Crisis.pdf%20.pdf

Spain:

Open platform DD created by educational communities, activists and governments

Since 2011, collective protests and resistance against the different forms and processes of privatization "of" and "in" education, and more recently against the presence of technology corporations in the public education system, have gained strength in Spain.

One of the most outstanding actions took place in Catalonia in 2020, when a group of families developed an awareness campaign on the data mining processes of technological companies while students interact on their private digital platforms. At that moment, families were urged not to authorize the use of Google Suite in public schools.

Several activists, hackers, and academics committed to the fight for democratic digitization of education joined the movement. In 2022, they developed an alternative digital platform called DD, with financial support from the public sector. Based on free, auditable and open-source software, the tool reinforces the integrity, transparency and sovereignty of data in educational public policies.

The DD pilot was implemented in 2023 in 11 schools in Barcelona. The platform is based on seven principles: (a) incorporating human rights and democracy as the basis of digitization in education; (b) considering public administration as the competent entity to guarantee digital rights; (c) critically evaluating all stakeholders involved; (d) starting from a comprehensive concept of digital literacy and digital culture; (e) adopting a holistic framework of digital skills; (f) incorporating the digital infrastructures of schools as the backbone of educational policies and strategies; (g) commiting to open knowledge.

The DD platform and the "5As"

The initiative is committed to the **availability** of education, although it was implemented in only 11 schools. Although it has the potential to meet universal **accessibility**, it still does not fully meet it, given that it is not accessible for people with disabilities. In relation to **adaptability**, content and practices do not consider the full diversity of rights holders. In terms of **acceptability** and **transparency**, the DD platform meets all requirements. The experience has a high potential to counter corporate tools if its use is extended to other schools, with the support of the public sector.

Foto: @freepik

Brazil:

Conexão Escola-Mundo project draws on hacker culture to educate for citizenship

Conexão Escola-Mundo emerged as a **research and intervention project** of two Brazilian **public universities** (Federal University of Bahia and Federal University of Santa Catarina) and students from two foreign universities (University of Barcelona and Università degli Studi Roma Tre). It lasted five years (2017-2023) and its objective was to reduce digital gaps in basic public education, through the development of democratizing technologies.

The experience was **implemented in two schools**, but the study focused on the Colégio de Aplicação (CA) in Santa Catarina. University and primary school teachers, undergraduate and graduate students, primary and secondary school students, and school principals participated in the project, in an interdisciplinary work "in" and "with" the school.

The project was based on three pillars: (a) **hacker culture**, understood as autonomy in decision-making, collaborative work, decentralization of power and implementation of ideas, practices, and digital objects to transform the world; (b) **education oriented by human rights**, avoiding hate speech, violence and discrimination in the virtual environment; and (c) **activist research**, supported by the Open Science movement (free of commercial interests).

Gradually, the students participated in different workshops to **learn and practice the hacker culture and the creative use of digital technologies**, based on topics chosen by themselves (cinema, elections, environment, the sound of their own bodies, use of social networks, etc.). Podcasts, video clips, remixes, games in virtual environments, among others, were produced.

The initiative eased the appropriation of technologies by students and teachers, who learned how to **use and develop tools and applications**. Besides, the critical use, including of corporate platforms and tools, was converted to a permanent learning for the school.

Foto: @Wavebreak Media

Conexão Escola-Mundo and the "5As"

Although focused on a single school, the experience relates to the dimension of the **availability** of the right to education, since the digital technologies used were available to all students. In terms of **accessibility**, they were free and universally accessible. Even though the technologies were not standardized, they were not **adapted** to the needs of people with disabilities. The project covered all the aspects of **acceptability** and collective management of the actions. **Social control** and **accountability** were guiding principles of the project, which has potential to counter corporate technologies in schools. However, it had a limited duration and scope.

Mexico:

Jnopik Intrabach, a platform to preserve the Tseltal language and culture

In Abasolo, a rural community in the municipality of Ocosingo, in Chiapas, Mexico, most of the population speaks Tseltal. In 2006, many of the adolescents attending *Colegio de Bachilleres* 105 (Cobach 105) did not speak Spanish, but the only didactic texts available were in the Spanish language and were not adapted to the local context.

To address these difficulties, teacher Luis Ramón Alvarado Pascacio decided to create a website on a local server with materials in Tseltal. In addition **to correcting the absence of adequate texts, digital inclusion was stimulated in a context of precarious internet connection.**

In the first year, the teacher prepared tutorials in Spanish and Tseltal to use proprietary programs installed on a local server. Subsequently, he created a computer center that used a local network and Linux operating system. In 2010, thanks to a donation of equipment, the platform expanded and reached another school in Ocosingo, which also covered part of the Tseltal community.

Little by little, **the platform aroused the interest of other communities**. In 2017, the Cobach 105 installed internet access via Wi-Fi, which allowed it to add new free applications to the *Jnopik Intrabach* platform and expand interaction with other groups.

Between 2013 and 2023, the project supported the installation of the necessary infrastructure to implement the platform in other municipalities: Chilón, Oxchuc, Las Margaritas and Altamirano. Currently, it is present in dozens of primary schools, two secondary schools, fourteen high schools and a community center.

One of its achievements was the **creation of a repository with materials in Tseltal** for students from kindergarten to high school. The resources are freely accessible. The platform still offers users encyclopedias, free courses, educational games, and interactive Math and Science simulations. Despite its importance, the project has received **little support from authorities** and is supported by volunteer work and community funds, limiting its scope.

***Jnopik Intrabach* and the "5As"**

The platform is **available** and **accessible** to the indigenous communities involved and has the potential to expand and counter the use of corporate platforms. However, it does not yet address the needs of people with disabilities, global developmental disorders, or giftedness. Its content is **acceptable** and **adaptable** to local needs, encouraging the preservation of the Tseltal language and culture. Although students actively participate in the creation and socialization of content, giving them authorship and control over their creative work, and despite there being a strong community support through donations, there is a lack of a collegiate system that manages the project and its resources, which could expand **accountability and social control.** On the other hand, no tools have been created to protect users' data.

Foto: @diana.grytsku

United States:

Free technologies strengthen community ties at Penn Manor

In Penn Manor Educational District, Pennsylvania, United States, since 1999, **free technologies have been used to promote critical thinking**, citizen education, reinforcing community ties and the **desire to change the world**. It all started when Charlie Reisinger, technology team coordinator at Penn Manor, decided to lead the **implementation of open-source software in technology infrastructure in all schools**, serving 5,550 students.

The first experience was the creation of a rating and attendance system based on free software. During the summers of 2001 to 2003, students were invited to assemble computers for all educational units, with the support of volunteers. Over 25 years, an integrated library was established in the district, hundreds of blogs and websites, a school newspaper and a learning management system using different free and open platforms. In addition, **links** between schools, students and communities **were strengthened.**

Confidence in the ability of students to solve problems and in teachers to develop innovative forms of interaction and teaching are fundamental principles of the project. In 2019, all students were expected to receive a flexible and powerful computer, and permission to explore Linux systems and customize their desktops, experiencing the entire universe of open-source programs. However, in the wake of the global COVID-19 pandemic, the Education Administrative Committee of the District opted to distribute Google Chromebooks to meet the demand for distance education. Thus the project had to adapt itself to them.

Despite the changes, the district continues to use free software on other computers and encourages students to use it as well. The apprentice program is still active, expanding its scope to computer maintenance and repair through a Help Desk for the school community. How to use AI tools positively and critically has also been discussed.

Foto: @Wavebreak Media

Penn Manor and the "5As"

The experience illustrates the powerful possibilities of using open-source software in education. Free software is **available** and **accessible** to all. The initiative promotes critical digital literacy, oriented to real and contextualized social action. The use of digital tools is aligned with an explicit and counter-hegemonic educational philosophy that values the ability of students and teachers to influence their environment through cooperative learning. It also relates with the dimensions of **acceptability** and **adaptability** of education. The initiative uses open and free software, which is more **accountable and auditable** than others carried out by corporate tools.

Brazil:

Onda Digital Program mixes technological training, labor insertion and environmental justice

The *Onda Digital* Program (POD for its acronym in Portuguese) was created in 2004 by Federal University of Bahia (UFBA), in Brazil, under the coordination of Professor Débora Abdalla. The project, of university extension, seeks to disseminate the achievements and **benefits of scientific and technological research developed in public institutions of higher education**, complying with the 1996 Law on Guidelines and Bases of National Education (BRAZIL, LDB/96, Art.43[2]).

Although the main objective is digital inclusion through free technologies in public schools in vulnerable communities of Salvador and neighboring municipalities, the program is also implemented in community spaces. In addition to providing computer courses to students, training is offered in programming, computer assembly and maintenance, digital content creation, digital media security, internet and communication, to **facilitate job inclusion** in communities. Likewise, it educates about the importance of reconditioning computer equipment and the impact of digital waste on **environmental sustainability**, using technological waste in recycling, robotics and crafts activities.

The program is funded by the public university itself through scholarships to academics and periodic transfers of funds for regular activities.

Onda Digital Program and the "5As"

The initiative is **available** to students aged 13 and more, from socially vulnerable communities, linked to the UFBA. It exclusively uses free software, which guarantees **accessibility**, although no specific actions have been implemented for people with disabilities or global developmental disorders. It places the perspectives of inclusion and sustainability at its core, dialoguing with the **acceptability** dimension, and the interventions are **adapted** to the needs of the students. The project invests in mechanisms of **accountability and collective social control** in the construction of its actions, guided by principles of participatory planning.

Foto: @jcomp

3. Lei de Diretrizes e Bases da Educação Nacional. Dec 20. 1996. Available at: planalto.gov.br/ccivil_03/leis/l9394.htm

Lessons learned and recommendations for public policies

1. Although technologies present additional challenges for the protection of human rights in education, **the normative framework of the human right to education remains fully applicable to guide new practices.**

2. **It is possible to create alternative public systems**, adopting free software and democratizing teaching methodologies, **enriching and not replacing face-to-face education** through the critical and emancipatory use of technologies. Identifying, supporting, and scaling up public policy experiences in this field is a way forward.

3. **Technologies must be open, free, and sovereign.** States must control and regulate the development of technologies, stimulating the creation of platforms, artificial intelligence tools and others that respond to the public interest.

4. **It is essential to adopt open-source technologies.** This allows users to understand how their data is stored and used, as well as allowing modifications to adapt the program to their needs, improving security and privacy.

5. **It is crucial to work on digital literacy.** Basic education curricula must include the necessary knowledge to use digital technologies, know-how to behave and participate in the digital sphere, protect one's privacy and protect oneself from *cyberviolence* and crimes in a virtual environment, interpret information critically and identify the circulation of fake news. They should also promote understanding of the political and social aspects of digital technologies, of the use of AI in education and in all spheres of social life.

6. **Teachers and students can produce technologies.** Educational communities must be stimulated and accompanied in order to lose their fear of technologies and to use them creatively and collaboratively, according to their needs and expectations. This will favor the creation of new platforms and alternative tools, and will contribute to overcoming the current corporate oligopoly for the development of new technologies.

7. **It is urgent to reduce digital inequalities, which overlap with historical inequalities,** by closing gaps in access, use and quality of technologies. Moreover, even alternative experiences must be adapted to the needs of people with disabilities or developmental disorders.

By: Latin American Campaign for the Right to Education (CLADE) and Latin American and African Network of Researchers on the Privatization of Education (ReLAAPPe)

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