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The integration of technologies into education during the pandemic and the challenges to Brazil's digital sovereignty

A integração de tecnologias à educação durante a pandemia e os desafios à soberania digital do Brasil

La integración de las tecnologías en la educación durante la pandemia y los desafíos a la soberanía digital de Brasil

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Abstract: The Covid-19 pandemic has made the appropriation of digital technologies by schools compulsory, exposing development gaps in structure and teacher training. This scenario has opened the way for the entry of private platforms, notably through non-transparent agreements made by governments at all levels. This article discusses public policies and training practices for the critical integration of technologies, which we argue is essential for building the country's digital sovereignty and emancipatory education.

Keywords: Technology and education, Digital inclusion, Public policies in education, Colonialism, Digital sovereignty.

Resumo: *A pandemia de Covid-19 deu à apropriação de tecnologias digitais pela escola um sentido compulsório, que explicitou lacunas de desenvolvimento tanto em estrutura como em formação de professores. Tal cenário abriu espaço para a entrada das plataformas privadas, notadamente a partir de acordos pouco transparentes, realizados pelos governos de todos os níveis. Este artigo visa debater políticas públicas e práticas de formação para a integração crítica de tecnologias, o que defendemos ser condição essencial para a construção da soberania digital do país e uma educação emancipadora.*

Palavras-chave: *Tecnologia e educação, Inclusão digital, Políticas Públicas em Educação, Colonialismo, Soberania Digital.*

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Resumen: *La pandemia de Covid-19 dio a las escuelas un sentido obligatorio de apropiación de las tecnologías digitales, lo que puso de relieve las brechas de desarrollo tanto en la estructura como en la formación docente. Este escenario abrió espacio para la entrada de plataformas privadas, en particular a través de acuerdos no transparentes celebrados por gobiernos en todos los niveles. Este artículo tiene como objetivo debatir políticas públicas y prácticas de capacitación para la integración crítica de tecnologías, que sostenemos ser una condición esencial para la construcción de la soberanía digital del país y una educación emancipadora.*

Palabras clave: *Tecnología y educación, Inclusión digital, Políticas Públicas en Educación, Colonialismo, Soberanía Digital.*

INTRODUCTION: THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN SCHOOLS

Very recently, the Education sector has been called into question due to its lack of effective integration of Information and Communication Technologies (ICT) into its teaching systems, from basic education to higher education. We are referring to the health urgency of the SARS-Covid pandemic, which in 2020 led to social isolation measures and compulsory technological immersion to resume our activities safely. This meant schools and universities had to close and resort to remote and online teaching when conditions and resources permitted. The pandemic did not have the same universal impact throughout society. We saw the exacerbation of pre-existing social inequalities. Schools, instead of being a place for the democratization of opportunities, became an excellent marker and reproducer of social injustices imposed on children and young people due to their place of birth, race, social class, etc. The Multidimensional Poverty in Childhood and Adolescence in Brazil study (UNICEF, 2023) shows that the proportion of 7-year-old children who cannot read or write spiked from 20% to 40% between 2019 and 2022, especially among black children.

The problems associated with this came from several sources, the first being access to infrastructure. We know that 82% of internet users aged 16 or above, who attended school or university in 2020, participated in classes or activities remotely. 36% of these students claimed they had difficulty accessing and attending the classes due to a lack of or poor internet connection quality. There is already great social inequality in terms of the devices used to access remote activities as only 14% of internet users from 'class DE'[4] households in school or

4 In research carried out by the Brazilian Internet Steering Committee (CGI.br), the socioeconomic classification is based on social classes: classes AB, class C and classes DE, based on income, from highest to lowest, respectively.

university used a computer to access remote classes in the first year of the pandemic, while in 'class AB' households, this number was 79%, with 14% of students from these households having bought a new computer during the pandemic[5].

The greater concentration of cell phone use in class DE households (54% compared to 22% for class AB households) highlights another issue regarding limited participation and creating/broadcasting content on mobile devices. Furthermore, internet connections for users in class DE households were primarily established through mobile phone plans, with data consumption restrictions. The exception to this is social media applications such as Facebook, Instagram, WhatsApp (Meta), and Twitter (X), which have commercial agreements with the major phone operators to encourage use (zero rating). Video conference classes, online collaborative activities, or activities that require a good, stable internet connection were ultimately inaccessible for more socially vulnerable students, thus excluding them from said activities.

Data from 2021 on the challenges teachers faced educating during the pandemic highlight several contrasts between the public and private ecosystems: the lack of devices and internet access in students' homes (91% in public schools and 61% in private schools), students having difficulty contacting the school and/or teachers (86% in public schools and 69% in private schools), support for students who live in socially vulnerable conditions (72% in public schools and 27% in private schools). The only indicators that were roughly balanced were the inability of teachers to conduct educational activities with students using technology (69% in public schools and 65% in private schools) and the teachers' increased workloads (86% in public schools and 82% in private schools), meaning there was not so much discrepancy in terms of the challenges teachers faced, regardless of the education network[6]. Perhaps this is why printed materials provided by schools were the second most used teaching resource in households with public school students aged 6 to 15[7].

By the pandemic's beginning, the old goal of integrating technologies in schools had not yet been accomplished. However, we could have overcome this lack of school infrastructure and the deficiency in teacher training if we had started earlier. In 2019, only 82% of schools in Brazil had internet access; however, there was an extensive range of regional inequality: 3% of schools in the South had no internet, followed by 6% of schools in the Southeast, 2% in the Midwest, 23% in the Northeast, and 48%

5 ICT-Covid-19 Panel (4th edition): https://cetic.br/pt/pesquisa/tic-covid-19/

6 ICT Education 2021: https://cetic.br/pt/pesquisa/educacao/

7 ICT-Covid-19 Panel: https://cetic.br/pt/pesquisa/tic-covid-19/

in the North. The reasons given for these inequalities were the lack of infrastructure in the region (74%), at the school (71%), and the high cost of internet connection (48%)[8].

Students in urban schools said that in the last three months before the pandemic, they had conducted online activities such as watching videos, programs, films, and series (94%) and researching for schoolwork (93%). Yet only 45% said they had posted a text, image, or video that they had made. In other words, children and young people use the internet at school to access information and consume content, but they seldom post or send anything themselves. In high school, this number reached an alarming 9%.

This leads us to another gap we identified in the data: only 68% of all public-school teachers claimed that the education network provided them with training on how to use technologies in pedagogical activities, with a significant representation from the South (80%), in the capital cities (88%), and the State network (83%)[9].

This whole scenario occurred when schools depended more on ICT for communication, but what ended up happening was that the schools, which should guarantee the democratization of access to education (a human and constitutional right) just continued to reinforce and reproduce the country's social inequalities, particularly during and after the pandemic, a problem that Brazil and the new generation will now have to deal with for many years to come.

The problem we are referring to here is access to infrastructure, but another critical issue is digital literacy. Technology, as we know, is not neutral; it is loaded with values that promote lifestyles that are not predetermined; they depend on human appropriation of technologies, but can be conditioned by what happens in their uses and spaces. This is not a new debate, not even for the perspective of the Critical Theory, which proposes that instead of simply resisting the permanence and penetration of technologies in the various spheres of human life, it is necessary to recognize the catastrophic consequences of technological development, while also recognizing the promise of greater freedom it can bring. As such, it is essential to realize that "the problem is not in technology as such, but in our failure so far to invent appropriate institutions to exercise human control over it" (Feenberg, 2003, p. 9).

The critical thinking perspective deals with the possibility of an empowering education that integrates technologies as tools and as objects of study and cultural contexts. Nevertheless, technology is not the problem, and it is also not the solution. On the one hand, we live in a context affected by digital technologies, and we must

8 ICT Education 2020: https://cetic.br/pt/pesquisa/educacao/

9 ICT Education 2020: https://cetic.br/pt/pesquisa/educacao/

ensure that these technologies do not enter schools merely as instruments, as they are not neutral. Therefore, the only way to have some control over the programmed order embedded in technologies is by promoting digital literacy so that people can make a critical reading of technologies and media so that they can make a vital and creative appropriation of them, something that can be accomplished by being authors and producers and not just consumers and users.

Buckingham (2022) argues that media education, which was developed during the older era of mass media, needs to evolve and face the challenges of digital capitalism. He also upholds the need for comprehensive and systematic media education programs to be a fundamental right for all young people, emphasizing the importance of a critical understanding of the media. He argues that the risks and benefits are contextual and complex, and that media education must adopt a more comprehensive and necessary approach to the current media challenges, particularly the internet and social networks (Buckingham, 2022).

This fearful scenario of inequalities in digital inclusion, added to the urgent demand for access to technologies and media education for students and teachers, leads us to think about public policies for integrating digital technologies in education.

PUBLIC POLICIES FOR INTEGRATING ICT INTO EDUCATION

The public policies of the Brazilian Ministry of Education (MEC) for integrating ICT into basic education have a historical emphasis on the technological dimension (Pretto; Tosta, 2010; Barreto, 2001; Quartiero et. al., 2015; Almeida; Prado, 2011; Almeida; Valente, 2016). The first programs approached this issue, as we saw with "TV Escola"[10] which in 1996 provided public schools with an equipment kit (television, VCR, satellite dish, satellite receiver and VHS tapes), or the "Programa Nacional de Informática na Educação/ProInfo"[11] from 1997 which equipped schools with a laboratory and computers and, after a revamp in 2007, included access to broadband internet and promoted the production of content, materials and educational resources in digital formats. In that same year, the "UCA" Project, "Um Computador por Aluno", was implemented to increase the use of ICT in public schools by distributing laptops to students, a policy that was soon replaced in 2012 by the provision of tablets. There were several programs implemented that continued this focus: "Educação Digital", "Educação Conectada" (there is currently another

10 Translated into English: "School TV".

11 Translated into English: "National Program for Informatics in Education/ProInfo".

program with a similar name, "Escola Conectada")[12], which demonstrate that the focus on access to technologies or ready-made digital content was always privileged (Ramos et. al., 2013). Even with the creation of the "NTE -Núcleo de Tecnologias Educacionais"[13], which was already discontinued in some states in Brazil, we observed that despite some equipment being delivered to the schools, it was not included in the daily school routine of students and teachers.

As we have argued before, access is essential but not enough, which means that schools need proper ICT infrastructure accompanied by changes in the school environment, working conditions, and opportunities for teacher training (Lapa; Pretto, 2019). However, what generally occurred due to Brazilian public policies was that school laboratories were set up to require large purchases of proprietary hardware and software. This model was of interest to the market because of the direct sales and because teachers and students became loyal consumers of their systems. From a pedagogical point of view, public policies of ICT integration into the curriculum were limited because it was treated as a special discipline or complementary activity dissociated from the main structure of the schools, and almost always from a technical and instrumental training perspective. In other words, their objective was to train users instead of educating people to understand and develop technologies. That is why, despite all the initiatives and investments over the years, we can say that the aim of providing technologies to schools is yet to be accomplished. This is even more evident when we consider that this integration should have privileged open and free source products from the start, fostering an appropriation as developers capable of transcending the role of users and consumers to that of authors and producers.

It is essential to recognize that over all these years, when infrastructure provision was the focus, several public policies aimed to train teachers to integrate technology into teaching. It is important to note that a typical response here is to blame teachers "who do not move from their comfort zones", who "are resistant", who are "from another generation". However, we observe the complete exclusion of teachers and school professionals from decisions directly affecting them. Hernández and Sancho (2000) have already shed some light on this matter when they demonstrated that changing pedagogical beliefs and premises about new educational policies or programs is the slowest stage of change promoted by education innovation. With regards to new teaching materials and technologies, along with new teaching approaches, the real battle lies in the cultural dimension because "if there is no connection with the conceptual constructions and the way teachers act, if there is

12 Translated into English in order of appearance: "Digital Education", "Connected Education", "Connected School".

13 Translated into English: "Educational Technology Centers¨.

no necessary acceptance and adequate practical decisions, their objectives end up being diluted and losing their meaning" (Hernández; Sancho, 2000, p. 31). External proposals that do not include teachers with their conceptions, ways of acting, and their concrete demands are detached from current and future teaching practice.

Even with a top-down offer that presents few career incentives, most of which without any real in-service conditions (such as teachers having allocated hours to study, avoiding night and weekend courses at their own cost), we can find the public initiatives of teacher training. However, these programs followed the instrumental and technical approach, that is, the focus was on training for technical mastery of the tool and its functional integration, generally within the same pedagogy and responding to the nationally standardized curriculum. A few examples of these types of programs are the extension course "TV na Escola e os Desafios de hoje"[14], which trained teachers to use audiovisual resources available at "TV Escola"[15], or the "Programa de Formação Continuada de Professores do Proinfo"[16], which offered courses, generally online, for training teachers by articulating the distribution of technological equipment in schools and the provision of multimedia and digital content and resources provided by government repositories. Some of these examples are the "TV Escola" e "DVD Escola", "Domínio Público" ou "Banco Internacional de Objetos Educacionais¨[17]. That is, the concern with teacher training always appeared to be in the background, almost always to address the lack of integration idealized in the programs, with the goal of the training paths being limited to the application of resources as a pedagogical tool, which does not allow for the integration of ICT into the pedagogical projects of schools (Quartiero et. al., 2015) and does not lead to an effective change in education.

It is worth highlighting that those public policies of the 1:1 model (One computer per student), combined with the facilitation of access to mobile technologies at the beginning of this century, gave rise to new technological movements in schools and the potential of networked and ubiquitous communication. This latest development brought uncertainty, insecurity, and tension as teachers and managers could no longer control the actions of children and young people in schools. While this new reality opened schools to the potential for authorial and innovative pedagogical practices of mobile technologies, we have also seen the banning of smartphones in classrooms, and the insufficient infrastructure at schools (Cordeiro, 2014; Quartiero et. al., 2015).

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14 Translated into English: "TV in School and Today's Challenges".

15 Translated into English: "School TV".

16 Translated into English: "Continuing Education Program for Proinfo Teachers".

17 Translated into English in order: "School TV", "School DVD", "Public Domain", "International Bank of Educational Objects".

Also worthy of note are some political initiatives toward an open culture. The free software social movements gained strength in the 2000s. They inspired the Lula government to promote public access to the internet with programs such as the "Pontos de Cultura" (Turino, 2009) and the "Portal do Software Público"[18]. They also inspired the substitution of proprietary software with free software in schools. None of this occurred without tension. It was a big step to resist the Big Tech companies' lobby that pressured (and still does) public institutions, from the Ministry of Education to schools. It ensured their naturalized presence in education decision arenas. That is why, despite the progress, we want to draw attention to how much is still to be done. A fundamental difference between proprietary and free software lies in their development model, which is closed and hierarchical in proprietary software, while free software is open, collaborative, and decentralized (Silveira, 2018). At that point, the model adopted for the Brazilian educational system was open licensing, but with a concentrated development process, that is, free software with a proprietary spirit. For instance, when the equipment purchased had free solutions embedded, there was a centralization of the power to change the code (such as Linux Educacional), or even a restriction on installing other software (as was the case with UCA). This means that in terms of implementation in public schools, it was left to the hands of the company that won the bid, without incorporating the characteristics of an open development model (Pretto et. al., 2021a).

More recently, this scenario has gained another layer that deserves attention: the inclusion of schools in the era of social media platforms. Platforms are computational infrastructures that operate on a technological architectural model that allows for the development of information flow systems between the owner company and third parties (Helmond, 2019), while they offer users an integrated interface that connects applications and allows social interaction. The emergence of platforms as the dominant social web model (both economic and infrastructurally speaking) reached schools in the fragile situation we had already presented, making it easy for them to take advantage of the everyday discourse of the inevitability of school modernization through ICT integration, where digital technologies are almost always taken as synonymous with efficiency and effectiveness in education.

The underlying problem pointed out by Éverton Almeida (2021) is that ICT (virtual environments, digital platforms, social networks) are configured as an appropriate means of producing a neoliberal subjectivity, necessary for developing the current production model, and justifying the interest corporations have in education. It is not surprising that large digital technology corporations named by GAFAM

18 Translated into English in order: "Culture Point", Public Software Platform". More information at: https://www.gov.br/governodigital/pt-br/software-publico.

(Google, Apple, Facebook/Meta, Amazon, and Microsoft) surround educational systems in Brazil. The biggest problem with the approach of technology companies is the inability of the Brazilian State to guarantee that their market interests are not above the social interests, which should be its prime concern. Instead, we have seen a clientelist stance that places itself at the service of companies in the education sector.

Furthermore, if companies previously lobbied for the sale of equipment and software licenses, today they do not offer us technological devices, but an environment of communication and social interaction in which their profit lies in extracting and selling their users' data. Their platforms have become a common infrastructure for supporting other technologies and the sociotechnical arrangements derived from them. They have positioned themselves as the infrastructure for organizing, storing, interacting, and intermediating countless processes we carry out daily (Parra, 2018). They are practically an obligatory gateway to the internet, as if they constituted the internet itself and not just private spaces.

This is a process of concentration that has been little investigated and that, despite this, is spreading in educational and academic technologies through the entrepreneurship of education that circulates with great ease and apparent neutrality in political and governmental discourses. Its progress was accompanied by the Educação Vigiada[19] survey, which found that in 2021, 19 state education departments used educational services provided by Google or Microsoft. It is noteworthy, however, that when a few companies begin to control the supply of communication products and services for basic and higher education systems, more caution is needed.

Another critical aspect of the public policy for integrating ICT into education is what education professionals can do. This concern with teacher training is understood as the instrumental logic we pointed out previously. The integration of ICT into education remains conservative, and innovation is restricted to individual initiatives in the pedagogical practices of isolated teachers. These teachers are creative, for sure, but are unable to affect their colleagues and have their good experiences spread to others due to the dominant structure that is resistant to it. Regarding the most innovative initiatives that we point out in public policies, such as the opening for the implementation of free software in educational institutions, not only did teachers not receive this training for the critical and creative appropriation of ICT, but they were not involved in the choices nor were they given space and time to understand the reasons that led to migration or its implications for education and the country. (Bonilla, 2012; 2014).

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19 In English: "Educação Vigiada" ("Surveilled Education"). More information available at: https://educacaovigiada.org.br.

When we insist on media education, we seek to transcend the dimension of an instrumental approach; we emphasize its social and political aspects, which we understand to be appropriate for citizenship education in digital culture. To this end, it is necessary to consider media education in its entirety as ethical and aesthetic content, as a means of communication and pedagogical tools, and for active participation as a citizen in digital culture (Belloni, Bévort, 2009; Fantin, 2006). Through critical education, this would be an alternative to fight against the standardization of turning individuals into consumers and not citizens (Pretto, 2013; Lapa, 2013). It would enable individuals to be critical and creative in their process of appropriating technology to better understand their role in society as authors and producers, not just as receivers and consumers. We are dealing with integrating technologies in education as the foundation (Pretto, 1996) for them to be present in digital culture as active subjects, in emancipatory and transformative action in society (Lapa et. al., 2016).

We stand for integrating media education into school curricula, as per Buckingham (2018). Yet for this to reach basic education, it must start with teacher training. What we have pointed out so far is that public policies for both the integration of technologies into public education systems and teacher training are lacking considering the size of the challenge and, as Buckingham states, we need to guarantee comprehensive and systematic media education programs as a fundamental right for all young people, emphasizing the importance of a critical understanding of the media. Initially, there were many utopian ideas about digital media: the promise of liberation, empowerment, and expanding democracy (Lapa; Coelho, 2021). However, how these media merged with modern capitalism resulted in more surveillance and inequality. The way out of this would be by adopting a more comprehensive and critical approach that provides a broader understanding of these contemporary arenas fundamental to our sovereignty as a country.

DIGITAL SOVEREIGNTY

Current discussions about the media, especially the internet and social networks, often focus on risks such as cyberbullying and misinformation or benefits such as access to information, creativity, and facilities now promoted by generative artificial intelligence systems. However, as we have seen, the risks and benefits are contextual and complex. Since its unfulfilled promise to promote greater democracy, we have seen the internet evolve under the thumb of the market, being appropriated over the years by large companies that determine its flows and user interaction

(Evangelista, 2016). This affects several aspects of our lives, such as politics (Cesarino, 2022) and the economy (Zuboff, 2019; 2021), and has given rise to a new moment in capitalism, one which is defined as a standard of global power (Quijano, 2005).

According to Zuboff (2019), there is a new economic order that appropriates free human experience as unpaid material for its practice of extraction, prediction, and sale, which gives a concentration of great power into the hands of these entrepreneurs that move across societies and nations. This new form of capitalism profits from the ever-increasing digitalization of our lives as we gradually, and voluntarily, adhere to it and freely give them everything we do in our professional and personal relationships. This instrumental rationality of mathematical codes has advanced to the point where the market has expanded and now informs us on consumption, sociability, health, politics, citizenship (practically everything!). This easily becomes (in a non-transparent way) raw material for the concentration of power among these entrepreneurs (Oliver et. al., 2023).

Capturing personal information, usage patterns, and behavioral trends has become the focus of internet companies (Stassun; Pich, 2019), and elements of this scenario such as big data, metadata, algorithms, data mining, and predictive analysis are the arsenal of technology corporations where "the government that only has global statistical information about the lives of its population is easily supplanted by the government of online companies, which have intimate information about each person" (Stassun; Pich, 2019, p. 256). The 2016 US elections and the 2018 Brazilian elections have already shown us the vulnerability of society in the face of the political use of the population's data (Alexander, 2018). We mentioned earlier that people voluntarily adhere to the dominance of the current era of contemporary technological development; however, we amend this slightly when pointing to Sérgio Amadeu da Silveira, who states that this adherence is not voluntary but somewhat coercive[20]. These spaces are designed as new public arenas for social interaction, work, study, and leisure, with economic, political, and social flows that no one wants to be excluded from. However, unlike a public square, these spaces are privately managed, and the entrance fee is consented to the terms of use, even without knowing what they mean. As a new phase of capitalist exploitation, we are facing the emergence of new possibilities for extracting value, exploitation, and domination: "A new that does not break from the old, but updates it" (Faustino and Lippold, 2023, p. 24). And it is getting worse; we now witness the concentration of income in the hands of these prominent technology entrepreneurs, while at the same time, there is a considerable increase in poverty throughout the world (Silveira, 2021; WBO, 2022). However,

20 Interview with Sérgio Amadeu Silveira, then president of the National Institute of Information Technology (ITI), in Carta Capital Magazine on 03/17/2004 under the title "The penguin advances", taken down due to legal action brought by Microsoft.

this global generalization is also misleading due to an essential geopolitical factor that produces inequality. Just as understanding surveillance capitalism helps us decipher the dilemmas of this most recent phase of the capitalist exploitation system, there is another essential key of understanding in the concepts of digital colonialism (Kwet, 2019), which exposes the dynamics in which, on one side, there are the ones that creates and dominates technologies and, on the other side, the ones that is subjected to economic exploitation and data extraction. According to Silveira (2023, p.15):

> The new colonialism is datafied and its often-subtle violence produces the not-so-gentle precariousness of work and points to an entangled and gamified social submission that formats individuals subjected to machine servitude and the algorithmic systems of the Global North.

Looking at this new moment of capitalism from the perspective of colonialism is an approach taken by epistemologies of the South. They explain however that this is not a new movement of exploitation, but rather an update of modernity that, since the 16th century, has placed conquered and dominated peoples throughout the world in a position of natural inferiority, affirmed by the creation of historical identities based on a geography of power (Quijano, 2005). This indicates that technological innovation cannot change the trends set in motion by the capitalist project provoked by colonialism and establish a standard of power with a global vocation (Quijano, 2005). While First-World countries continue to develop and work on notions of human rights and individual freedoms, the colonized peoples in Third-World countries live in a context where these rights are denied. Thus, we cannot lose sight of the fact that is in this context that power struggles currently occur, where we occupy the place of a peripheral country always on the margins of centralized capitalist production. In this case, our public institutions are weaker in guaranteeing the regulation of the media and implementing protective policies for citizens, to the point that we become an interesting experimental arena where the disparities of current surveillance capitalism are substantial (Zuboff, 2019)

The field of education was not spared and has become a strategic space for capitalist expansion. As Almeida (2021) stated, collecting and systematizing educational data has become a goal for both the State and private companies as it is an asset of immeasurable value for them, regardless of its danger to the population. Worsened by the pandemic, we have watched in astonishment as large commercial companies' implementation of proprietary platforms and services has increased based on contracts or memberships with limited transparency. The growing supply of "free services" (which hide in schools and universities a business model characteristic of large technology companies such as Google and Microsoft) was naturalized through the discourse of "inevitability" done to the urgency of the pandemic, with significant

penetration in the private and public sector at all levels of education. Of course, due to a lack of clarity regarding the terms of use and user privacy, the uncritical adoption of ICT was validated with the rapid platformization of education (Pretto et. al., 2021).

The new form of colonization of education, which previously existed but was exacerbated with the pandemic, has been mapped by a few studies (Cruz & Venturini, 2020; Almeida, 2021; Amiel, 2024). These studies showed that the agreements between Brazilian public institutions and technology companies associated with surveillance capitalism are presented as a wolf in sheep's clothing, that is, they are presented as the ideal technical and economic solution to these institutions' inability to manage their information systems by themselves (Parra et al., 2018). What goes unsaid is that this inability to develop and maintain technical infrastructure was intentionally built as a project, a dependence that directly results from financial austerity policies and a lack of investment in education (Amiel et. al. 2021; Pretto, 2021). We claim that the pandemic ended up justifying and legitimizing the private occupation of public space in education, a strategy that was supported by several actors such as public managers, school leaders, and the academic community who, without any extensive public policies and systematic planning, found they had no other alternatives during the pandemic. The businessmen took advantage of this and intensely harassed the education systems, eventually paving the way for their 'occupation' (Pretto et.al, 2021a).

The vulnerability of countries in the global South to the use of Big Tech in education, whether in applications and services or hosting and storage infrastructure, was brought to light in a study conducted by the "Observatório Educação Vigiada"[21] (OEdVig). A recent survey (2023-2024) on the platformization of higher education revealed unprecedented data on Google (Alphabet) and Microsoft's growing dominance over the communication infrastructure of public higher education institutions. It showed how much these companies impact the public educational service. They discovered that 76% of institutional email servers in Latin America are stored on Google or Microsoft servers, while only 24% are stored on other storage servers. Google is the most dominant company, controlling 58% of the domains. Microsoft follows with 18%, while the remaining 24% represented other alternatives, which generally means the institutions use their servers. Cuba is the only country in the region that uses 100% of its servers, followed by Uruguay, with 85%. In Brazil, 83% of its public higher education institution domains are stored on Google and Microsoft servers (Cruz et. al., 2023).

21 Translated into English: " Surveilled Education Observatory¨.

We previously pointed out the concern over the formation of captive users, access to data on children and young people, and internal and unlimited information about Brazilian basic education. We also believe platformization in universities represents a further danger to the country's scientific production, which has also gained space due to the fragility of public institutions in Global South countries, which provide investments in education, research, and development to guarantee their sovereignty minimally.

FINAL CONSIDERATIONS

In this paper, we argue that ICTs are the contemporary expression of an older problem that has long been a challenge to education: the political control of capitalism. More than that, it is a process that Freire (2020) defines as dehumanizing and objectifying. We live in a time when capitalism is characterized by the flows of digital communication, which is a key point to consider when considering ICT in education and its possibilities.

Therefore, the political aspect that underlies the relationship between ICT and schools is closely related to the idea of praxis, as conceived by the Brazilian educator Paulo Freire. This refers to the action/reflection relationship, which starts with a critical understanding of the structure, operation, and ownership of the media that make up the digital ecosystem. This is an essential step preceding the appropriation of these technologies by the field of education. Paulo Freire (2023, 2020) argued that education must be transformative, meaning it must transform what it is into what it should be. Our goal with this paper is to highlight certain aspects that should be considered so that ICT can be appropriated into education and toward the emancipation and transformation of people into critical citizens. Once again, it is about recognizing how education can overcome the extreme situations (idem, 2020) that have historically arisen and cemented inequalities.

Based on the arguments constructed here about the context of ICT use in Brazilian education, the public policies that have been implemented, and the threats to digital sovereignty, we hope to create a map of tensions (Martín-Barbero, 2009) that addresses the issue in the field.

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