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COVID-19 and Education: the impacts on higher education from the confrontations, potentialities and future perspectives

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ABSTRACT
The transformations caused by the COVID-19 pandemic affected people's routines and lifestyles on a global scale, especially regarding the role of technology. This becomes clear when we examine the state of education currently. The sudden suspension of traditional teaching and the critical aspect in the academy may be the perfect opportunity for a new examination of the potentials and challenges higher education currently faces. This article aims to circumscribe the pandemic's impacts on higher education and its constituents: students, professors, and educational institutions, after this great increase in technology's role in people's daily lives. This is materialized from a bibliographic review by the presented studies of Educação Vigiada "education monitored" (2020), GAFAM's monopoly over digital education platforms, and how data colonialism comes unnoticed as a consequence of the new technology-focused lifestyles. It was sought to draw a panorama from the opinions of students and teachers, through the SEMESP (2020) survey, pointing to the challenges and potentialities that will help in the adaptation of education in the future context.

KEYWORDS: COVID-19. Education. Higher Education.

1 INTRODUCTION

In mid-March 2020, the World Health Organization (WHO) issued a worldwide statement officially declaring the COVID-19 pandemic. The issue established a landmark of transformations and unreliability in the confrontation of the virus that reached most of the planet, even though in different forms. The adaptations caused by social distancing were imposed in the fight against the pandemic not only restricting commerce and services in general, but also including the area of education, mainly because teachers and students are now learning and teaching from home, but the school staff, such as librarians, maintenance staff and others also had their jobs affected. These effects of the pandemic had reached since nurseries and daycares until higher education and post-graduation levels, in both public (municipal, state, and federal) and private institutions.

While some had been slightly adapted to the model of *working from home*, others had had difficulties and had been paralyzed. So far, it is understood that the pandemic, in a hierarchical way, has left no exceptions – it affected all social classes and all the areas of activity in the labor market and education, especially the lower-income strata. All in-person university activities were suspended by official determinations. On June 1st, the 5th report from the National Education Council made recommendations regarding the replacement of in-person activities by remote activities which allowed universities to proceed as they deemed more convenient. As well as each Dean's office, school board, and faculty members, the official manifestation demonstrated that the Ministry had not found any unanimous solution. R*emote* learning, then, became the most efficient response, transforming education and labor relationships.

With the emergence of digital technologies since the last decades of the 20th century, there were lots of impacts in social, cultural, and economic life and also in the spatial distribution of services. The organization of life in contemporary society has undergone changes which, according to Ramires (2019), were generated from both positive and negative conceptions after the popularization of internet access. In this context, the technology sector and the market have been using digital devices for teaching outsourcing, dismissing some traditional and formal bonds between the company and the employee. Regarding education, there is a universalization of electronic devices as knowledge mediators and its structure may seem to follow the same path which substantiates the technology and information market even more. The contents of the on-site faculty subjects had to be maintained, even with the difficult restriction working conditions; teaching plans were filled out only by a protocol

for it was known it would not be possible to offer some faculty subjects in the same way as before the pandemic.

The adhesion to digital services by universities has been contributing so that the database, which is generated by several app-companies users, begins to replace citizens with algorithms. According to Abilio (2019), this new model causes a productive and organized appropriation of ways of life and social vulnerability, in addition to the monopoly of the economic sector. Still, in accordance with Abilio (2019), this flexibilization of education services results from decades of neoliberal policies that include new forms of labor organization, causing a transformation regarding work relations between the company and employee mediated by platforms and the economic impacts due to - or intensified by - the pandemic. With those neoliberal reforms made in higher education in the last few decades concurring with the radical institutional dismantle in several stances of the Brazilian public sphere, neoliberalism can be understood as a political project executed by the capitalist class to consolidate their profit capacity, influencing political processes to privatize or lead both State institutions and the regulatory powers in a way favorable to their interests (ANDRADE, 2019).

Based on research on the path of teaching adaptations to digital media, intensified in 2020, this paper aims to understand how the process of education digitalization was accelerated, which was initiated based on devices and applications created in order to spread both outsourcing services and replacing face-to-face services to digital ones. This present paper goes through educational perspectives, the ascension of GAFAM (Google, Apple, Facebook, Amazon e Microsoft) as a supporting tool to the universities, and the state-of-the-art of these processes to both private and public higher education. Analyzing the difficulties faced by students, professors, and Institutions of Higher Education [*IES - Instituições de Ensino Superior*] and, finally, it draws an overview of Brazil and its tendencies to become a digital colony due to the provision of data to such companies, which we will call *data colonialism* and foresees what will be carried forward in the post-pandemic context, analyzing the challenges and potential of transformations in education and teaching grounded on references made by Educação Vigiada (2020), the work of Amadeu (2020a e 2020b) and the work entitled *Adoção de Aulas Remotas* [Establishing Remote Classes], a research made by SEMESP (2020). Finally, it is then questioned what are the perspectives of what we are experiencing now, which will be considered normal in the future, understanding the challenges and opportunities along this path.

2 OBJECTIVES

The general objective of this article is to circumscribe the impacts of the COVID-19 pandemic in the educational scope of higher education, and its possible relations with the advance of the technological mediation on daily aspects from our realities and habits, which may be a source of data of a new process of colonization of the individuals related to the education in Brazil. In addition, there is also the goal to interpret the current moment, understanding that this is part of the path faced between challenges and potentialities for post-pandemic education. Based on research by different authors, a literature review is carried out grounded on the analyzes produced not only in the context of the pandemic but also in the cases intensified by it, focusing on changes and transformations in the educational environment, which are related between the principle of teaching and learning, going through the roles of students, professors and teaching institution as a provider of subsidies for education in the pandemic.

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3 METHODOLOGY/ANALYSIS METHOD

Aiming to achieve the listed objectives, the paper was developed from the deductive and sampling approaches, which according to Gil (2002), departs from the general principles to the particular, through the formal exercise of analyzing a part for the whole and understanding the context. Starting from premises based on a series of readings, the works previously developed by different authors were used as theoretical references, as the methodological proposal of this work does not involve the elaboration of questionnaires and interviews. The paper elucidates how the expected results were achieved as it follows: starting from research on the privatization of education, focusing on GAFAM, and bringing a literature review on the state-of-the-art to clearly illustrate the potentials and difficulties of the digitalization of the educational environment and the retention of information made by the current most powerful digital companies. Also through the literature review, the mapping elaborated by Educação Vigiada's research was analyzed, which sought to understand the public-private partnerships that encourage migration of personal to digital services in the area of education. It also was reviewed, through the Semesp's survey (2020), the impact of work digitization, thus understanding what this entails in the improvement of usual services and what this represents for data colonialism.

4 RESULTS

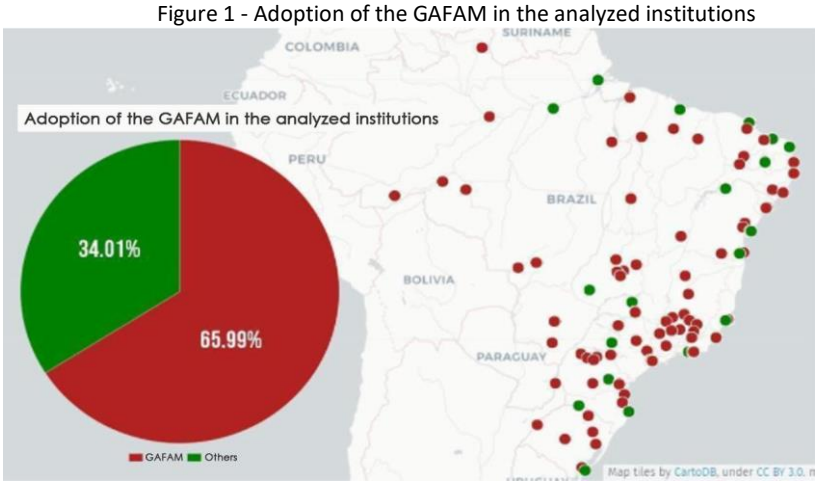
4.1 A monopoly of technology services in Education

At several universities, the process of contracting internet and digital storage services was intensified with the demarcation of the pandemic. Two large companies, Google and Microsoft, already provided this type of service, in addition to the educational medium for communication, data storage, and work planning. The key point of this research is the intensification of a large number of courses, live streamings, special events, discussion and study groups organized within social media such as Facebook, YouTube (owned by Google), and Instagram (owned by Facebook, as well as WhatsApp) which escape the time and space relationship outside the digital environment. It is worth mentioning that Google, Apple, Facebook, Amazon, and Microsoft (GAFAM) currently represent the largest financial empires on the planet. These companies took control of the technologies that guide our consumption, showing new times and ways in production and access to digital knowledge (FIORMONTE; SORDI, 2019). Even with the crisis that hit the world market due to COVID-19, these companies were not harmed and grew even more. "The humanitarian and health crisis expanded the scenario for obtaining more information from the populations of the planet" (AMADEU, 2020b, <http://www.ihu.unisinos.br/>).

Aiming to alert on the advance of the monetizing logic of the GAFAM on the Brazilian public education, a research mapping was carried out by the Educação Vigiada [Education Surveillance] project and lead by two centers of research from the Federal University of Pará (Universidade Federal do Pará - UFPA) and by the initiative *Educação Aberta* [Open Education]. The research entitled "*Capitalismo de Vigilância*" [Surveillance Capitalism] and *the Educação Pública do Brasil* [Brazil's Public

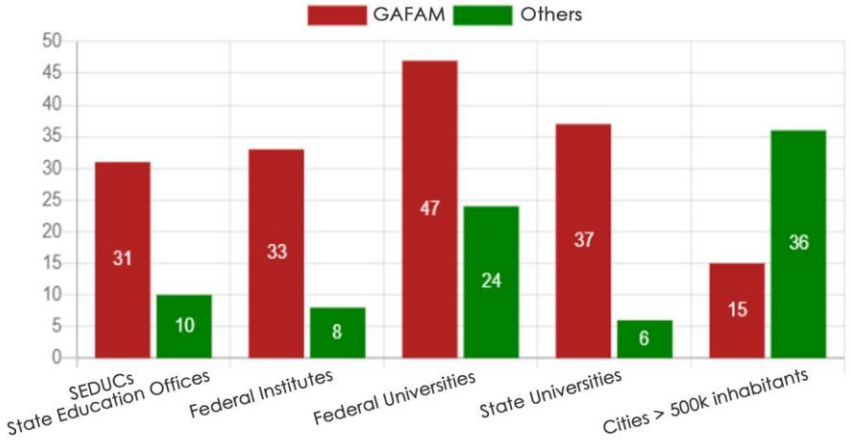
Education] aimed to alert the people involved in educational processes - professors, staff, parents and students - as well as researchers and the community in general about problems regarding the privacy, surveillance and data security of professors, students and researchers in the public education institutions in Brazil (EDUCAÇÃO VIGIADA, 2020). We state that, even before the pandemic, the research showed that a little more than 65% of public education institutions in Brazil - universities, federal institutes, state-owned education offices, and municipal education offices in cities with more than 500 thousand inhabitants - had already delivered their employees and students' data to GAFAM. The data regarding the "Others" category are, in general, employees kept by the public institutions or government entities (EDUCAÇÃO VIGIADA, 2020).

Figure 1 - Adoption of the GAFAM in the analyzed institutions



Source: Educação Vigiada (2020, <https://educacaovigiada.org.br>), modified by the authors, 2021.

Figure 2 - Types of institutions that adopt GAFAM, in numbers



Source: Educação Vigiada (2020, <https://educacaovigiada.org.br>), modified by the authors, 2021

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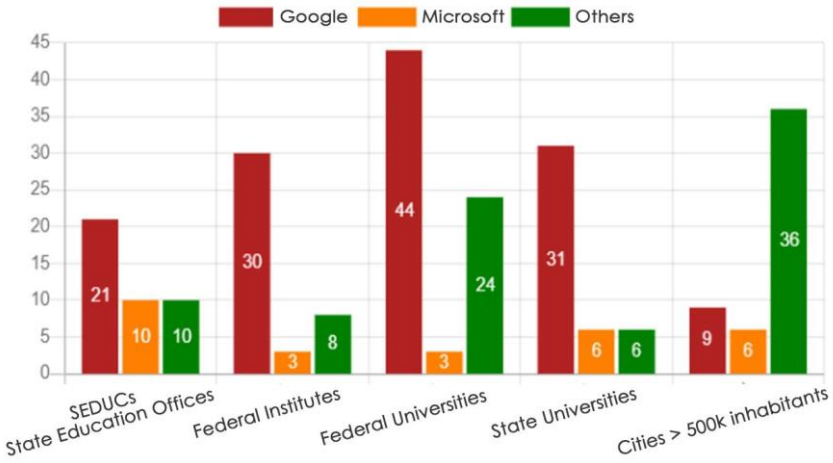
Figure 3 - E-mail services adopted by type of institution, in numbers



Source: Educação Vigiada (2020, <https://educacaovigiada.org.br>), modified by the authors, 2021

Researchers involved in the mapping state that when the public-private partnerships are established and the migration of services is made, such as the institutional e-mail, it is very difficult that both institutions and networks can reverse this dependency scenario. Moreover, the adoption of GAFAM services in the Brazilian public universities is directly related to the budget reduction and the dismantling of these universities. The podcast entitled *Tecnopolítica*, hosted by Sérgio Amadeu, on the episode "#32: Educação Vigiada", Filipe Saraiva (one of the researchers of the Educação Vigiada project) affirms that UNICAMP (University of Campinas), after acquiring Google services in 2016, faced an immediate scenario of budget cutbacks on their computational maintenance, diminishing from 3 million in 2016 to 880 thousand in 2017, and from then on, the cutbacks were intensified (AMADEU, 2020a).

The pandemic has deepened this situation as most classes are now taken on Google Meet, where they are recorded and stored in Google Drive, as well as institutional researches, contact lists, student notes, shared agendas, submission of activities and tasks, etc. which are now stored on the platform. Before acquiring such services from GAFAM, universities had to make an effort to invest in technologies to obtain their database and storage. Today, this is no longer reflected in the ownership and possession of the institutional educational environment in Brazil. Furthermore, it is paradoxical to think that companies that profit from data have full access to both children's and teens' data, compromising the right of privacy and protection of these young people's personal information, who are already monitored from an early age. Thus, as mentioned, public universities are at the mercy of these corporations (especially Google and Microsoft) which, in addition to having this valuable data, are not affected by the legislation, because there are no laws in the current digital territory that can regulate partnerships established by public education agencies with commercial organizations.

Thereby, surveillance capitalism, a concept used by Canclini (2019) and Amadeu (2020a) to explain Capital reproduction "based on personal data extraction by digital technologies to foresee people's behavior and thus, offer products and services" (AMADEU, 2020a, <https://www.youtube.com/watch?v=onnMU_iY8zY&t=1394s>), thrive on the lack of knowledge of society regarding the matter and on the lack of regulatory measures that control and punish inadequate actions of these companies. We are unable to protect our own data and the State does not offer an alternative model for that. Moreover, the use of GAFAM services by public education

institutions in Brazil shows that this dependence leaves the institutions vulnerable if these services collapse. As previously occurred professors and students were unable to connect, they became hostages to an unoperated system and were unable to fulfill their functions, which show the dependence on the digital environment.

4.2 The perspectives of remote education for students and professors

Although GAFAM was already inserted in the university environment after the declaration of the pandemic at the beginning of 2020 everyone had to adapt to the situation. Emergency decisions were made for this atypical situation experienced worldwide, which we will deepen by analyzing the student's and professor's points of view through a study carried out by SEMESP Institute in 2020. The research is divided into three parts involving higher education, which are: Part I: Remote learning in the view of the undergraduate student; Part II: Remote teaching in the view of the professor; Part III: A comparison between the student and professor's perspectives. We summarized the issues of Parts I and II below to discuss the impact of this present paper.

The research points out that about 99.1% of public and private institutions of higher education migrated to remote classes (online), with adaptation criteria to the model, where the classes had to be rescheduled at the same time that their participants sought to get acquainted with new learning and teaching methodologies using technology. We sought to "acknowledge the main difficulties and learnings that this experience left in the educational life of professors and undergraduates" (SEMESP, 2020), aiming to "understand the professors' behavior during the first months of the pandemic" (SEMESP, 2020). Questionnaires were applied to professors and undergraduate students enrolled at the university, and to students who evaded it during the pandemic.

Although the research works with the descriptive axis of "positive" and "negative" issues for both professors and students, we understand that these issues are broader and depend on points of view. Thus, the terms for potential and challenges of remote education were changed, the synthesis is presented below in the literature review.

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Table 1 - Challenges and Potentials on the experience of students and professors with remote learning in IES [IHE - Institutions of Higher Education] according to the SEMESP survey (2020).

	Challenges	Potentials
Student	1. Problems with the methodology and/or didactics of the classes; 2. Difficulty concentrating and/or adapting to the remote model; 3. Problems with the Internet; 4. Equipment/Tools; 5. Lower quality of classes online; 6. Monthly Fee/Discounts; 7. Services: difficulties of communication with the administrative sectors, in addition to the lack of organization, information, assistance, and support of the IHE.	1. Classroom methodology and didactics; 2. Professor's dedication; 3. Optimization of time and money; 4. Easiness in the adaptation with remote classes; 5. Support, communication, and efficient aid of the IHE.
Professor	1. Lack of student's interaction and participation - pointed as the main difficulty; 2. Equipment/Tools; 3. Adaptation in a short period; 4. Problems with the Internet; 5. Classroom methodology and didactics;	1. Learning regarding the use of technological tools; 2. Support of same professional colleagues; 3. New methodologies of education; 4. Flexibility and practicality; 5. Surprises with the remote model.

Source: The authors, 2021.

In public Institutions of Higher Education, the result of the research pointed out that:

> […] both complaints and learnings were practically the same as for the private ones, with the difference that the students did not have financial problems. However, on the other hand, many were dissatisfied with the absence of remote classes, as several public universities and/or professors did not make the content available online. (SEMESP, 2020, < https://www.semesp.org.br/pesquisas >).

Although some points appear both as a challenge and a potential, we discuss below the perspectives for the future of education.

The first issue is the methodology or didactics in class, which for the students the classes caused discouragement as they were just watching the screen with muted microphones and no webcams. Tiresome and with no interactions, these classes proved to be unattractive for many students, leaving out extra-classes activities as well. Meanwhile, most of the professors considered that the adopted model was the most adequate and possible for the moment, also considering that they were prepared for the new model. The professors agree that the classes presented are attractive in this new format.

A positive issue listed by students is the convenience of recorded classes available which helps in the content review. Another positive issue was the professor's dedication in carrying out the classes in an unusual way, even without the possibility of prior planning. Students had also indicated that the methodology and didactics adopted by professors had helped to improve class performance, in addition to their willingness to answer students' questions. Oral presentations and seminars gained more space than essays and multiple-choice tests, as well as written assignments with quizzes, videos prepared by students, and other extra-class activities.

In the professor's opinion, students are no longer participating in remote classes. Even with the convenience of attending them, the looks and expressions of doubt show the lack of reinforcement of content in the subject matter, which can only be achieved with face-to-face interaction. Professors also affirm that most students remain with no cameras on. The non-adaptation of methodology leads to difficulties regarding concentration and organization of studies, reflecting in low absorption of contents, aggravated by the lack of an adequate, silent, and non-shared environment at home. As for the professors, even with the difficulties in teaching, the work environment was adapted over the months and they considered that, after training or support of other professors, they became able to use digital resources to teach and present the classes.

Even with a short period of adaptation, professors reported that they learned using new tools and ways of teaching with this new class format. As the majority of the professors were trained for remote classes, few continued to use the same methodology as in face-to-face classes. Almost half of them highlighted that class time remained, however, with fewer expository moments and more interactive activities with an adaptation of new content such as videos, images, case studies, and discussion forums.

Unlike the professors, who mostly have good or excellent internet services, for students, problems with the internet were constant due to the lack of connection or even dependence on the data network, with no broadband connection. In this regard, the study shows that:

> The higher the family income, the greater the degree of satisfaction with remote classes. This can be explained by better conditions of quality access to the Internet (higher speed) and equipment (such as computers, laptops), in addition to a favorable environment for studying. (SEMESP, 2020, < https://www.semesp.org.br/pesquisas >).

Another presented divergent issue in the research refers to the low quality of the online class, which was considered by students as inferior to that offered in person. The lack of practical activities or mandatory internships, in addition to the lack of support from the institution and the inability of professors to deal with technological means, were the main reasons. Most professors responded that they already had prior knowledge of the tools used in remote teaching, and those who teach in private institutions were more satisfied than those in public ones. At the same time, students reported that these classes allowed flexibility, comfort, and security, where even with difficulties at the beginning, they managed to adapt and improve concentration over time.

Professors claim that the support given by the HEIs during the transformation of on-site classes to online ones could have been better. Many complain about the lack of training in the use of digital tools, a problem that they solved with help from other professors themselves, and they also complain about the excessive demand for results, lack of autonomy for coordinators, dismissals, and lack of technical assistance and psychological support. On the other hand, several had praised the institution's agility in adapting to the remote model, the offer of infrastructure, the maintenance of jobs, support, training courses, the concern with the quality of classes and services for the students, and recognition of the professors' work.

The service and support or communication with the HEI or with the professor still divides opinions among students, as they reported problems due to the lack of attendance service, e-mails, or telephone contact, mainly to request discounts or payment facilities. Other students were satisfied with the attendance service, the training of the professor, and rapid problems solving faced by the communication platforms, such as submission of activities or exam applications.

Concerning financial issues, students did not have discounts or adjustments in the tuition fee during remote classes, even with the absence of practical classes and external experiences. However, they reported saving time and money by not having to eat or move around, thus saving on the expenses was also mentioned by professors, exposing the flexibility and practicality of remote teaching.

It is noticed that the degree of professors' satisfaction is much higher concerning students, and this difference is since not all students were able to renegotiate tuition fees, and professors maintained their salaries for the hours/classes given.

> After the experience with the remote classes, more than half of the students (52.3% at private institutions and 51.3% at public ones) prefer to continue with in-person classes after the quarantine ends. [...] It is interesting to note that, despite attending an on-site course, 18.8% of students from private institutions would like to continue with live remote classes and 21.7% would like the course to be offered in hybrid learning (half in person, half online). Only 7.3% would like to continue with recorded classes. (SEMESP, 2020, < https://www.semesp.org.br/pesquisas >).

The results suggest that professors want to keep classes remote in the post-pandemic period, in a hybrid format, with both on-site and remote meetings, with synchronous classes. This reflects the need for contact with students and also the concern with health in exposing oneself. After all, few professors responded that they prefer to continue exclusively with on-site classes after the pandemic period.

Thus, we conclude, throughout the research, that the visions of opportunities and challenges are mixed and vary greatly according to the perception of the student or professor, the support of the institution, and are added to the individualities and socioeconomic conditions of each resulting in a controversial issue if we consider the extension of this model of teaching beyond the pandemic period. So, it is necessary to adapt the academic and educational environment during the pandemic, regarding which learnings with this medium should be taken into account, and which ones should be abandoned in order to have effective use of the taught content, so the students may graduate as good professionals to work in our society.

4.3 Understanding the issue beyond education

As already presented, GAFAM manages to have a great impact on the lives of people involved in education, this reflects positive and negative issues that guided the above survey among students and professors. Through a broader spectrum in terms of population - since a great part of the population today have access to digital media and data networks - it is necessary to understand that we have come to represent very different dimensions and realities. This is an interesting issue to companies, social media apps, fintech, and other organizations which improve their services based on our interaction with the world, as it represents primary material. Hence, this is an issue to be discussed in detail below.

Analyzing the historical context in which Brazil was a colony of Portugal from 1500 to 1822, with the scenario of exploitation by the royal family, settlement of hereditary captaincies and total control of overseas territory, and later with the Old Republic period (and even the New Republic period), we have always been tied to our products as raw material. Therefore, we must remember the

cycles of exploitation and extraction of raw materials and natural goods, demarcated by the cycles of *Pau Brasil*, sugar, gold, and coffee. There were intense commercial and political relations with other countries (Portugal, England, USA...) regarding the supply of our goods. This historical demarcation had been always linked to the interests of the dominant class, according to historians Schwarcz and Starling (2015). Thus, the commercial process is repeated, in which along with the coffee comes the rubber cycle, the building of railways by English companies, as well as the manufacture. After 1930, trade relations were opened along with the political and imperialist influence of the United States, yielding taxed trade facilitation in exchange for multinationals amidst the industrialization of the country. And again, the same commercial and political relationships are repeated, with a clear definition between dominant and dominated imposed by the capitalist environment.

However, dealing with the digital revolutions, the advance in the last 30 years of computerized and informational media which have been improved and its intensification experienced in 2020, it is worth emphasizing how much this production of digital raw material influences economically and reinforces the precepts of capitalist society. Amadeu (2020b, <http://www.ihu.unisinos.br/>), in a published article, states that “technology corporations exploit human experience as a free raw material. They treat behavioral data as their property, in a dynamic of usurpation." Thus, it is not enough to think that the current context is just a consequence of technological means, but of the neoliberal structure, in which human interactions, time reactions when seeing a new post, and other expressions interpreted as natural perceptions of reality are transformed as "any other natural resource in capitalism is priced and appropriated privately". And it is due to the fact that the "digital colony does not have matrix technology and therefore delivers its raw material in exchange for processed material" (AMADEU, 2020b, < http://www.ihu.unisinos.br/ >).

Presented in the article, a private company had its partnership approved with the Ministry of Science, Technology and Innovation, aimed at formulating public educational policies based on the content they obtain with the management and monitoring service of data from public high school students from across the country. Reaffirming, thus, the delivery “on a platter” of our education, the value and the imperceptible richness that our algorithms represent. Amadeu (2020b) understands this very clearly:

> Experience and the human condition have become raw material to be explored by platforms that can use data not only from the middle layers but also from the impoverished masses to train their machine learning algorithms. It is impressive that the more neoliberalism orders to reduce State costs, the more data extraction from impoverished countries to their headquarters advances. The leaders of Brazil do everything to ensure full conditions for data extraction here in the colony today. (AMADEU, 2020b, <http://www.ihu.unisinos.br/>).

In other words, we are exporting our data, refining the profile of underdeveloped countries that consume, share, research, and crave from the digital colony, or data colony, or even electronic capitalism, as Nestor Canclini describes “electronic computer-capitalism":

> This electronic capitalism takes us to incarnate: hooking us, submitting intimate tastes and thoughts to traces that have our control. Hidden in the “service”, a labor economy driven by the users' paid work, physical inclusion (clicks, body disposition, inactive time in front of the screen, etc.) is globalized. (CANCLINI, 2019, p. 81).

And the question is: who holds the knowledge produced by Brazilian science and education? Can we say that they are researchers, by their intellect, erudition, and their titles? Maybe so, but they

can be easily accessed by these companies that host their surveys, classes, and various contents at any time. And one more question arises here as to why, then, is Brazil not able to manage and control such data from cybernetic and interconnected space? Amadeu (2020b) explains that the colony does not have enough infrastructure to store *"data centers"* and, therefore, we started to deliver raw data to consume after services had already been processed. The author also emphasizes the "process of extraction and concentration of wealth in gigantic technological corporations headquartered in a few capitalist countries in a phase of deep neoliberalism that became neocolonial" (AMADEU, 2020b, <http://www.ihu.unisinos.br/>).

From this, it becomes essential to point out and compare historically that we are not talking about a political and governmental entity to which we submit. We are colonized by technological corporations, no longer by a country (kingdom or politically and economically demarcated territory), but our colonizer is in the power of online data clouds and private algorithms. Colonization, where whoever is dominant, owns the storage. However, these private entities need to settle down – have their headquarters somewhere – and when we analyze GAFAM companies, they are all on US territory, respectively, in Mountain View, Cupertino, Menlo Park, all in California; Seattle and Redmond, Washington. In other words, we do not depend on the political state of the United States, but on the private environment based there. Thus, we are experiencing social dispossession, not just of means, territory, and security.

And, since GAFAM's central and operating physical structure is outside the Brazilian territory, what are the government policies or actions in order to protect or regulate the use of this data? The answer Amadeu provides goes against this data protection; he explains that the measures taken by Brazilian rulers present themselves as if "there was no other way but to deliver our population's data to companies that seek to convert the flows of our lives into a torrent of data to be processed." (AMADEU, 2020b, <http://www.ihu.unisinos.br/>). Are we, then, living from the exploration and export of raw material from the contemporary environment that has so much value, as were Brazilian natural goods once? Yes, because in "digital platforms", more than a user performance and better usability,

> the behavioral surplus is consolidated into data that are extracted as if they were natural resources. [...] These companies do not come here to take *Pau Brasil* or precious metals, they take personal data that will be processed and sold in samples for commercial and political marketing. (AMADEU, 2020b, <http://www.ihu.unisinos.br/>).

The result of this colonialism - understood from billions of dollars in the technology sector and a horde of new users who adapted to the temporal demarcation of the COVID-19 pandemic - acts on a worldwide scale in the manipulation and management of data. Then, it is worth raising other questions that may not have a closed and much less conclusive answer so far, which are: What can they do against someone, on an individual scale? Do any laws protect the individual and/or education? Do they have repercussions beyond the economy, but also in politics? If they do, how? This just reaffirms that we are being part of the data market.

Our role is no longer just that of simple users, that is, we play the role of educating machines and, in a very subtle way, this data delivery or disaggregation takes place from the unread acceptance terms, or internet search in which we allow sharing subjects, personal data obtained in the collection of digital tracks and information about the behavior of users of its services and products that are a

source of profit for these companies. Thus, we started to improve algorithms or even influence political campaigns, such as the one in the United States in 2016.

Therefore, the thought remains: to what extent our source of knowledge is not in the national territory, with teachers and students, but stored in a "cloud". It means that our knowledge is "colonized" and becomes raw material where no jurisdiction or law prevails beyond the agreement of terms and use, which we quickly go through from “read" to "accepted” daily.

5 CONCLUSIONS

Thinking about the post-pandemic issues and their impacts in the future, through the analyzed works, the relevance of the discussion is perceived as it impacts everyone's life. When cut to the effects on education, the subject is highly transformed and, therefore, it is important to strengthen the studies and to have a critical view of the current moment, since surveillance capitalism thrives on the lack of knowledge of society on this topic and by the lack of regulation with measures that limit and punish inappropriate actions by the holders of our data. The companies who compose the GAFAM represent what is the most powerful way in which contemporary neoliberalism expresses itself through in-depth surveillance and which put not only education but also the political and governmental means at risk.

This scenario represents fertile soil for the expansion of an economy based on the market of personal data and on a dispute of companies that retain such data. Would it be possible to have a way to decolonize these technological means? What would be the future paths? And how would education take place, knowing that today the dependence on these technological means is on the rise, causing challenges and potentialities?

There is no doubt that on-site classes in the post-pandemic period will have to be reformulated. The experience of students, family members, professors, and institutions managers with remote education should evoke, at the very least, a constructive and thought-provoking discussion on this topic, in which the transformative vision of education should be strengthened.

The potential appears in the breaks in physical and geographic distances, through which students started to participate in various courses, live streams, lectures, and other digital events that corroborate the dissemination of knowledge, the reduction of expenses, and the establishment of a connection with other students, professors and researchers.

This debate led to the understanding that the challenges are more numerous and have a greater impact than the potentialities found so far. Still, there are other challenges to be thought about regarding the impact of online or hybrid classes on social interaction, regarding mental health through the tiring experience of the created remote environment, as well as the need for adaptation when inserting the system for children, as their educational and learning process requires a physical interaction that goes beyond the family nucleus. For young adults who are graduating, the difficulty stems from the need for contact with others, critical thinking formation, and debates that only the physical space of the university provides for professional development. These issues open the way for new jobs and require the vision of professionals from other areas as well.

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