


## TIME IS ALWAYS AGAINST US: TEACHING EXPERIENCES WITH DIGITAL TECHNOLOGIES IN EMERGENCY REMOTE TEACHING

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### ABSTRACT

This article presents the results of a research on the use of Digital Information and Communication Technologies (DICT) present and used during the COVID-19 pandemic, its impact on education and the development of Emergency Remote Education from the perspective of teaching work. Through reports from teachers who worked during the period of social isolation in a private vocational education institution, located in the municipality of Parnamirim in the state of Rio Grande do Norte (RN), between March and October 2020. The theoretical framework covered was based on the following authors in the axis of DICT and teacher training: Castells (1999), Pierre Lévy (2010), Lemos, Cavalcante and Motta (2018), Cavalcante (2022) and Cavalcante, Lemos and Almeida (2023). The analysis of the interviews was carried out through the Discursive Textual Analysis (DTA) methodology and in this work the Matrix system is used as a metaphor, which is based on a quadrilogy composed of the films: Matrix, Matrix Reloaded, Matrix Revolutions and Matrix Resurrections. The results show that the educational experience and experience with some technological resources during the pandemic provided positive and negative aspects: lack of access for students, problems in the separation between personal and professional life, need for training in the use of these tools. The teachers point to these impacts and to the difficulties of adapting to the use of these technologies, since some DICT used during the pandemic were not developed for education, but started to be used in education.

**Keywords:** Professional Education, Emergency Remote Teaching, Teacher Training, Digital Information and Communication Technologies.

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## ENTERING THE MATRIX: SITUATING THE RESEARCH

At the end of 2019 we were surprised by a virus, at first with the emergence of the first cases registered in the city of Wuhan in China. On January 30, 2020, the World Health Organization (WHO) declared a Public Health Emergency of International Concern as a result of the new Coronavirus (COVID-19, resulting from SARS-CoV-2). In March 2020, the most restrictive measures against the pandemic were adopted in the state of Rio Grande do Norte. Initially, face-to-face classes were suspended for 15 days of that same month, both in private and public schools (municipal, state and federal), according to the publication on the InterTV website on G1 (03/17/2020)<sup>4</sup>.

Also in March, on the 17th, the Ministry of Education (MEC), through Ordinance No. 343 (Brasil, 2020, edition 53, section 1, p. 39), establishes the authorization, on an exceptional basis, for the offer of non-face-to-face classes, using instruments and Digital Information and Communication Technologies (TDIC), that is, teaching mediated by technologies, remotely, set in digital spaces. Only in September of the same year was the private school network authorized to return to school activities in the face-to-face modality in the state of RN, on October 5, 2020, through Decree No. 29,989, of September 18, 2020 (Rio Grande do Norte, 2020).

The lives of thousands of people had to adapt to this new reality, that is, to inhabit a virtual space that is also real. Virtualization is the passage from the real to the virtual, being defined as something inverse to updating. For Lévy (1996), the virtual is not the opposite of the real, but a continuation of it. This new reality, caused and driven by the pandemic, brought significant changes, such as work and school entering the house without asking permission and we were inserted in these spaces, in the face of an unusual and unimaginable situation, mediated by digital technologies, some with experiences and experiences with these technologies and others not. There was a deterritorialization of these spaces.

Pierre Lévy (2010) also defines the term virtual as any "deterritorialized" entity, being capable of producing many manifestations at different times and in certain spaces, without it being trapped in a specific space or time. It would then be something without borders, without limits, present everywhere. From this perspective, the author reflects on

<sup>4</sup> Government of RN suspends classes in public and private schools because of the coronavirus. Portal G1, Natal, March 17, 2020. Available at: <https://g1.globo.com/rn/rio-grande-do-norte/noticia/2020/03/17/governo-do-rn-suspende-aulas-nas-escolas-publicas-e-privadas-do-estado.ghtml>. Accessed on: 02 Feb 2021.

virtualization when a person, a collectivity, information or an act in which they are not present, becomes deterritorialized. In our research, we refer as a metaphor to the Matrix system<sup>5</sup>, which consists of a saga composed of a quadrilogy of films: *The Matrix*, *The Matrix Reloaded*, *The Matrix Revolutions* and *the Matrix Resurrections*.

The plot is built and developed from the definition of the Matrix, which, according to the first film, is an intelligent and artificial system created by computers, which uses people's intelligence to deceive a real world while using individuals to produce energy, that is, people are like batteries that feed and sustain the functioning of the system (Matrix, 1999). It is present everywhere, it is a world that believes and places itself as real and unique so that its inhabitants do not perceive the truth. We carried this Matrix system at the beginning of the pandemic and fed it continuously in a condition of social deprivation.

The Matrix is a form of informational economy, developed by a new organizational logic, composed of diverse cultures and entities present on several continents, bringing with it cultural multi-referentiality, which is composed of diverse individuals. It is established by a certain culture and its own entities and is not only related to the beliefs and values of a certain society (Castells, 1999). What constitutes a network society is a group of individuals structured in communities, in which space determines time.

The research proposed here will seek to understand the movements that resulted in the work of teachers. In fact, many teachers have been led to choose virtual reality independently of their will, since, in the words of Morpheus<sup>6</sup>, "there is a difference between knowing the path and walking the path" (The Matrix, 1999). It was up to the teachers, as well as Neo, to be chosen for the mission of continuing teaching during isolation. In the case of teachers, choosing to take the blue pill meant remaining in physical reality, continuing in the same situation knowing the risk of contracting the virus and promoting its contamination and proliferation. Taking the red pill, understanding the Matrix, was the only option at the time of the pandemic, but this path was also the most complex. It turns out that most people are not ready for change, because many of them are so inert, accommodated, dependent on the system, that they will fight to protect it (Matrix, 1999).

For teachers and schools, there were a series of impacts: the search for the necessary infrastructure to make teaching viable, the need for training in the use and

<sup>5</sup> Direção: Lana Wachowski, Lilly Wachowski, ano: 1999, Roteiro: Lilly Wachowski, Lana Wachowski.

<sup>6</sup> Character from the Matrix quadrilogy who represents a program. And when he awakens from the Matrix, his goal is to find Neo so that he can also awaken.

knowledge of digital technologies, the fact that they were surprised by the pandemic in such a way that there was no time for training (training and development), nor for the installation of a ready and available infrastructure that would enable the Emergency Remote Education (ERE) that occurred during the time between March and October 2020, changing the perception of time, increasingly accelerated, virtualized and connected. After all, according to Morpheus: "Time is always against us" (The Matrix, 1999).

The general objective of this article is to understand the aspects that impacted their pedagogical practices in light of the reports of the interviewed teachers, with a focus on the use of DICT in this period. To this end, the text consists of three topics. The first brings a general reflection on technologies and their use in education, the second the reports of teachers who worked during the pandemic and the third final reflections.

## **THE USE OF DIGITAL TECHNOLOGIES AND THE PANDEMIC REALITY**

The constant change in the use of technologies in education, caused by the need to always be updated, requires teacher training, methodological changes and the need to strive so that the educational environment is no longer linked to the old and traditional forms of teaching, because, as Freire (2002) reminds us, students are not deposits for storing content and the teacher is only a transmitter of content for students to learn and repeat. It is necessary to think and act in favor of a transformative education. This reverberates in teacher training before and during a global pandemic, which forced these teachers to use DICT, whether or not they had adequate training to work in deterritorialized spaces when they were previously used to working in territorialized spaces, that is, in physical spaces.

Many authors indicate methodologies for the use of technologies in education, so that they better assist and serve as a stimulus for teachers and students, either to boost technological innovation, as a differential model of the work carried out inside or outside the school environment, or as an auxiliary instrument of the educational exercise in the procedures of elaboration, preparation of classes and elaboration of evaluation procedures, reports and feedbacks (Lemos, Cavalcante and Motta, 2018).

Digital Information and Communication Technologies (DICT), however, always bring some challenges, among which the main ones were listed by Sancho (2006) from the perspective of Distance Education (DE), such as: classes organized in structures of 45-50 minutes, the lack of motivation of the teaching staff to incorporate new methods, the disciplinary content of the curricula that complicate interdisciplinary projects and problem-

based learning, limitation of administration; structure of the space (accessibility to computers, number of students per classroom, etc.), the procedures for continuous training of teachers, which hinder educational changes, the limitations in the structuring of space and time, and the lack of autonomy of teachers and students.

In addition to these difficulties elucidated by Sancho (2006), there are also other realities that underlie possible obstacles to the activity of teachers. Lemos, Cavalcante and Motta (2018) state that teachers do not always have enough time for planning and training, since, in reality in our country, teachers have poor remuneration, causing them to have more than one employment relationship, working in one or more companies/schools, resulting in little time for other responsibilities that the teacher needs, how to plan, train, correct, prepare assessments and activities, in addition to the occupations of their personal life.

In the context of the COVID-19 pandemic, digital technologies mediated teaching modalities based on experiences with the blended *learning* form and the flipped classroom methodology and, due to the numerous technological transformations, the interaction between individuals who are in deterritorialized spaces, that is, who can find themselves in a digital medium or platform of exchange and interaction, occur in different geographical positions synchronously and/or asynchronously. Understanding which digital technologies have been applied in the educational context and the obstacles encountered by teachers in this process thus become an essential premise in the context we are going through. Therefore, a study in this area, situated in this panorama of professional education of remote teaching is essential and an important focus of investigation.

The lack of preparation to work with the use of educational technologies, as well as the digital technologies that were used for education, are related to several factors, as we have already indicated from Sancho (2006), but the pandemic has deepened these issues, as there are gaps in their use, ranging from the lack of equipment and access to broadband connection for interaction on communication platforms, to the socioeconomic situation of the students' families, which makes it difficult and even impossible for "the school to enter your home". However, through the decrees of both the state government and the MEC in the direction of offering the so-called Emergency Remote Education (ERE), it is likely to see impacts, important effects in the teaching-learning process, as well as in the critical professional and technological training of teachers (Silva, Silva, 2020).

This research is configured as a case study, analyzing home *office work*, infrastructure, teacher training for pedagogical performance, among other aspects in a Professional and Technological Education (EPT) institution of the private sector located in the municipality of Parnamirim in the state of Rio Grande do Norte during the COVID-19 pandemic in the period from March to October 2020 in which the ERE was specifically used. This study aims to analyze the professional profile of the faculty in this private educational institution in terms of their training and how these professionals prepared and updated themselves in continuing technical and pedagogical training, as well as their organization for emergency remote teaching (ERE) with the use of educational technologies and the ways in which they developed their performance in this period, taking into account the use of DICT.

At first, there were five teachers who worked at the school, possible participants in the research. However, we were unable to contact one of them, due to the fact that he was no longer residing in the municipality. The other had to be dismissed since, in the interview, he stated that, during the pandemic, he no longer worked at the educational institution where this research was conducted. The participants in the research, then, were three professors who worked during the period under analysis and work in a private educational institution of Professional and Technological Education (EPT) both in propaedeutic and more specific disciplines.

The teachers were interviewed through a script, but the perspective was to collect narratives of their experiences so that we could, in the light of the theories used and from their reports, understand the aspects of their teaching experiences during the pandemic. The research was developed through the collection of narratives of the teachers' experiences, carried out from interviews, a qualitative research method based on experiential, interpretive, situational and personalistic understanding (Stake, 2011). Mariani, Mattos, Clandinin and Connelly (2012, p. 663) state that "narrative research is structured in the intentionality of understanding and interpreting the personal and human dimensions beyond closed, cut-out and quantifiable schemes". With this, the objective of the research is to analyze the use of digital technologies based on the reports of the experience of professional education teachers in a private sector school and how this impacted their performance in emergency remote teaching during the pandemic.

For this, the methods of interview and comprehension of the reports from the experience of the interviewed teachers will be used. The analysis of the reports was carried



out seeking to observe the actions and events that, in the context researched, could influence the practices of the teachers. The interview, on the other hand, can be understood as "a procedure used in social investigation, for data collection" (Lakatos; Marconi, 2003, p. 195), as the intention is to collect reports from teachers, not only to describe their teacher training and experiences lived during the pandemic, but to record their experience, to have the opportunity to reflect, analyze, think about something that has not been thought or perceived before.

Therefore, for this investigation, semi-structured narrative interviews were conducted, since it was sought to preserve the integrity and fluidity of the dialogue in order to maintain the accuracy required in a qualitative research, since the interview guide brings questions that, in addition to the reflective answers, allow reports, in addition to allowing the researcher to ask other questions not foreseen due to the answers of the interviewees (Oliveira, 2020).

During the semi-structured interviews, we tried to make the interviewees comfortable and interrupt as little as possible, not expressing any opinion about what was said. Three of them were carried out mediated by the digital platform *Google Meet* and one of them was carried out in person at the Nebuchadnezzar Ship/School<sup>7</sup> and recorded using the cell phone recorder, it is worth noting that the recording was made with the consent of the interviewees and sent to their emails the Informed Consent Form signed by the interviewee and me. The interviews were described using the free version of the *Victor Voice software*<sup>8</sup>, after transcription, all of them were reviewed to ensure the integrity of the information said, comparing the text with the videos and the original audio. This research was submitted to the Ethics Committee and approved by opinion number 5,572,844.

## NEO'S ACCOUNTS DURING THE COVID-19 PANDEMIC

The fictional character of the Matrix quadrilogy, Neo, which in Latin means the new and philosophically the one who brings the awakening and awareness of reality, in this research represents the teachers in the pandemic. When the Matrix presents itself to them, the teachers become part of the human resistance revealing them as the chosen ones. Like the Matrix, the pandemic inserted part of them into an exploratory virtual environment.

<sup>7</sup> The Nebuchadnezzar ship is the ship used by Neo and the resistance group in the Matrix quadrilogy. In this research he is representing the school (locus of this research), without the fantasy of the Matrix.

<sup>8</sup> *Transcription software* available on the web through the website: <https://victorvoice.co/auth/splash>

Reality was not simulated, it imposed putting into practice the skills, competencies, knowledge and techniques contained or not in Neo.

For the understanding and interpretation of Neo's reports, we used Discursive Textual Analysis (DTA) as an analytical tool, which is presented as a procedure that initially separates the texts into units of meaning, that is, in which a unitarization process is developed that fragments the reports into units of meaning, which can generate others from empirical interlocution, theoretical and interpretations made by the researcher himself (Moraes; Galiuzzi, 2006).

In this movement of interpretation of the meaning attributed by the author, the appropriation of the words of other voices is exercised to better understand the text. After this unitarization, which needs to be done with intensity and depth, similar meanings are articulated in a process called categorization. In this process, units of similar meaning come together, and can generate various levels of categories of analysis. Discursive textual analysis has its foundation in the exercise of writing as a mediating tool in the production of meanings and therefore, in recursive processes, the analysis moves from the empirical to the theoretical abstraction, which can only be achieved if the researcher makes an intense movement of interpretation and production of arguments. (Moraes; Galiuzzi, 2006, p. 118).

According to Moraes and Galiuzzi (2006), DTA approaches data analysis that covers two types of qualitative research analysis: content analysis and discourse analysis. This type of analysis provides two reconstructions at the same time: the understanding of science and its means of production and the object of research and its understanding.

The research instrument used is consistent with the Discursive Textual Analysis (DTA), since the interview itself is semi-structured in units that refer to the same subject and themes asked to the interviewees and questions based on the agents, object and objectives of this research. The unitarization of the corpus was developed through the analysis of the answers/reports. The categorization was defined by the keywords contained in the questions of each axis of the research instrument and the word cloud (Figure 1) and the metatexts produced were based on the theoretical framework systematically mapped and by the analyses carried out from the data obtained in the interviews.

Neo is the main character of the Matrix film series and in this work he represents the teachers who worked during the pandemic. He leads trying to save people in the virtual reality in which he was inserted, he does not represent a savior, but a mediator of knowledge within the digital world, that is, it is not up to him to save everyone, but to mediate the path to the light of knowledge of reality that was established during the



pandemic. A warrior in an attempt to contain the sentinels<sup>9</sup> and the Smith agents<sup>10</sup>, the obstacles that arose during this teaching-learning process.

In 2020, the door of the ERE was shown, Neo walked through it with no choice. Option granted in a forced manner to mitigate the contagion of the coronavirus. At first, within the Matrix, he sought to transpose the school classroom to the virtual classroom, teaching mediated by digital platforms or social networks. Neo had not previously had training/education to work in the ERE. Upon entering the Matrix, Neo asks Morpheus if when he is ready he would dodge the bullets to come. The character reflects that Neo is very fast and strong, because his speed and strength are based on a world made of rules and a lot of control and that, as a result, they will never be as strong or fast as he can be. Morpheus replies, "When you're ready, you won't need it." (Morpheus, 1999). That is, when Neo is ready, he will face them.

At the beginning of the pandemic, teachers were required to enter the Matrix to continue teaching, within social isolation this continuity took place with the use of resources indiscriminately, without planning and adequate training for teachers. There was a lack of aspects such as public policies for access to the internet for all (in this context of students and teachers), adequate training, conditions for teachers to develop their practices in the best way and in different ways. (Santos; Olive tree; Quiroga, 2022). Despite all these aspects, Neo was forced to enter virtual reality without training.

It is worth mentioning that, in 2020, there was an increase in the number of registrations of remote workers in Brazil, which is still estimated to grow by 30% after the pandemic. This indicator was raised by studies carried out by Professor Miceli (2020), coordinator of the MBA in Digital Marketing at FGV, who states that this trend is irreversible and tends to grow more and more. It is worth noting that these studies are not centered on the work of teachers, but on professionals in general. In any case, the impact of remote work during and after the pandemic is evident.

In work mediated by TDIC, from the perspective of Antunes (2018), a new type of work emerges: the digital slave. In which workers, when there is demand, must be present in a virtual environment to meet intermittent work. Digital work has had an exponential growth of the new digital proletariat, in which we are connected by DICT, and has given rise

<sup>9</sup> Machines controlled to kill humans in the quadrilogy of the movie The Matrix.

<sup>10</sup> Character who represents a kind of virus that causes disturbance in the system and that acts to hinder the resistance movement led by Neo in the quadrilogy of the movie The Matrix.

to several other types of work. Also according to the author, the procedural result is that, regardless of the spaces of action, capital through the digital worker generates surplus value; It does not matter if the activities performed are more intellectual or not or if they are more instrumental or not.

For the working class, the pandemic period was much more intense due to the lack of choice, those who took the red pill went digital, as the class depends on its own work to survive (Antunes, 2020). Therefore, it was imposed on the working class to continue its activities even with the social isolation caused by the virus. To this class, the red pill was given for the continuation of work remotely and in an emergency. For education professionals, there was also no choice to continue teaching the way it was exercised before the pandemic.

Antunes (2020) reinforces that the working hours and the conditions for work activities carried out within the corporate environment are the same in telework, a modality that had significant growth during and after the pandemic. Another point to be emphasized is that in this modality, it is necessary to properly separate life time and work time so that there is no intensification of domestic work combined with the work performed in the company within the home environment.

The pandemic brought, for some education professionals, a new work environment (a virtual space), new structures and another space for action, a new way of communicating and a change caused by the need to continue teaching caused by and coming from society itself. However, listing these points shows that it is not only the teacher who changes, this fact is just a consequence, but all these structures that permeate him, especially the entire school structure.

For Cavalcante (2022), it is also within the school environment that teachers make their discoveries and improve their training. In the pandemic, the school environment changed place, providing a new daily life, a new perception, a restructuring and flexibility of time, causing the intensification of work, causing this teacher to relearn, learn, unlearn and restructure in a new work context, providing each teacher with a new cycle of professional development and learning, for some in a new digital space, broad for training, continuing education and complex due to many variables. Among these knowledges are those directed to the use of the resources necessary for education, one of them is technologies.

Linked to this change from the place of the school to the home environment, research carried out by the authors Lima, Sousa and Martins (2021) is in line with the

perspective of Cavalcante (2022) within this context, the intensification of teaching work during the pandemic, caused the increase of more activities inserted in their daily lives, such as new attributions demands for remote and home work. As well as other demands that include: child care, remote school monitoring, care for the elderly and people with disabilities.

It is worth remembering that the technologies used during the ERE already existed before COVID-19 and were used all the time in our daily lives, but their use and appropriation of technological resources in education require thinking from a didactic perspective, about how to use them; think about students' access to resources; think about the type of resource that is most appropriate to the learning objectives that are proposed at each moment; in teaching methodologies, among other aspects.

According to Caldeira and Zaidan (2010), pedagogical practice is a complex social practice and occurs in different spaces/times of the school, in the daily lives of teachers and students and in a context of inside a classroom, mediated by the teacher-student-knowledge relationship. In the pandemic, there was a change in the classroom space, from face-to-face to virtual, but the teacher-student-knowledge interaction was mediated with the use of DICT, that is, the interaction took place in another space, the digital one. Franco (2016) states that not all practice is pedagogical. Teaching practice is constituted as pedagogical when it is introduced into the intentionality foreseen for its action. Also according to the author, the teacher has a differentiated performance when he dialogues with the student's needs, closely monitors his interests, as well as cares about producing learning.

During the pandemic, what happened in Brazil was the use of Emergency Remote Teaching, which was an emergency arrangement mediated by DICT in educational institutions, with live and *online* classes with students at home and, in moments of relaxation of social isolation, with a part of the class at home and another part in the classroom. This format was more used by private educational institutions, under the argument of maintaining the flow of classes and not harming the socialization of the student body, but also very directed to meeting their financial demands, contrary to isolation, since the lack of socialization was linked to the risk of students, teachers and other school workers from being contaminated and becoming carriers of the virus (Cavalcante, Lemos and Almeida, 2023).

In this context, it is important to reflect on the conditions in which each crew member found themselves, both from the perspective of the teacher and the student, when they did not have a good quality internet necessary for the simultaneous interaction, during the class, to occur synchronously and not be interrupted by an operational failure (systemic or infrastructural), causing discouragement of the student body and impairing their learning.

[illegible]

<sup>11</sup> Web digital tool available at: <https://www.wordclouds.com/>

Figure 3 shows the relevance of the words obtained by the teachers' reports and that were explored during the interview by the research instrument. The terms and words that are evidenced by figure 3 spoken by the professors, reflect and represent in the cloud the report of the interviewees through the questions asked within the three axes of the research instrument, as well as demonstrate the repetition of greater and lesser intensity that generated information and data for the construction of the units of meanings that originated from the reports of the interviewees. The words also reflect the mediation of the dialogue during the interview with the research subjects.

The words and terms that reflect DICT are associated and present in almost all the interviews, the presence of the words "technologies", "computer", "*online*", "video", "recorded", "*Youtube*", "*Google*", "*Whatsapp*", "programs", "camera", as well as words that refer to the research subjects as "teacher" and others that guided the elaboration of the research instrument as "training" and "experience". The central word "Student", as well as "room" and "class" marked the dialogue. The words "house" and "room" reflect the invasion of the Nebuchadnezzar Ship (work) in the teachers' house. The word "pandemic" is present in the discussions, also highlighting the period of social isolation imposed by the virus.

The three interviewees, according to their reports, had already had some experience or training for distance education with some technological tools before the pandemic. Having this training and his notorious knowledge, reflected in a quick learning in the use of other DICT for other purposes, such as recording classes. Neo 01 reports that he took a course when he was a distance education tutor for the physics course offered by the Federal University of Rio Grande do Norte (UFRN). According to the professor, UFRN always held training courses for "distance learning, for the tutoring part". His experience as a distance tutor was almost two years before the pandemic period and the professor also reports that in this experience he had positive results in the development of the faculty. Neo 01 points out the use of digital media during this experience as a distance learning tutor at UFRN:

She helped, helped a lot... digital media, they worked on the digital media part, they also worked with us on how to deal with these students, right... the difficulties they would feel in distance learning. So we had training on how to deal with this situation, how to help these students... To give you an idea, I took students who didn't know what a mouse was and in the end we saw this student doing work, developing well... after all the work done with tutoring together with UFRN. So... We saw that there was growth. (Neo 01, 2022)

Neo 01 affirms the relevance of having had a little training, during the practice of working in teaching, to deal with students and their difficulties with the distance learning modality. He reveals how relevant this was in his training, because otherwise, he would have had difficulties working with students who didn't even know how to handle a *mouse*.

In data released by the IBGE and investigated by the National Household Sample Survey (PNAD), published by *the IBGE News Agency website (09/16/2022)*, <sup>12</sup>there was a reduction in the proportion of households with microcomputers between 2019 and 2021, falling from 41.4% to 40.7%. In urban areas, the percentage fell from 45.6% to 44.9% and in rural areas, there was a decrease from 13.8% to 12.8%. However, the most used electronic internet access device in 2021 was the cell phone, with 99.5%. In the same year, TV became the device for internet access in 44.4% of households, surpassing the microcomputer. The survey of data presented by the *site* is in line with Neo 01's report on the difficulty of some students in using the *mouse* of a personal computer, since also since, in a period of two years, the cell phone is the digital device of mass use in Brazilian society while the microcomputer is gradually decreasing.

Neo 02 reported that he did a training at SENAI/RN:

Senai, in a way, specialized us in several trainings, both training in the digital part and editing a video to post, how to edit a text... finally... And we have been working with some blended courses. I even worked with several face-to-face courses before the pandemic... (Neo 02, 2022)

Both teachers, Neo 01 and Neo 02, demonstrated the importance, based on the report of their experiences, of being in a training that would prepare them for teaching, even if through training and preparatory courses. The interviewee Neo 01 suggests in another part of the interview that schools prepare teachers for the use of DICT. Also according to his account, Neo 01 (2022) feels he has a certain "blockage" in teaching in front of a computer with a camera pointed at him without seeing the students around him.

[...] Some teachers also find it difficult to record a video lesson, so he doesn't feel comfortable. So I think schools could do it in a way that the teacher is there giving his class in the face-to-face room, and this class could be recorded and it could be used in the future as a video lesson. (Neo 01, 2022).

[...] A class recorded like this is better than that class where the teacher is sitting there in front of him, with the computer, with the camera pointed at him and saying "to no

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<sup>12</sup> Internet is already accessible in 90.0% of the households in the country in 2021. IBGE News Agency, Brasília, September 16, 2022. Available at: <https://agenciadenoticias.ibge.gov.br/agencia-noticias/2012-agencia-de-noticias/noticias/34954-internet-ja-e-acessivel-em-90-0-dos-domicilios-do-pais-em-2021#:~:text=De%202019%20a%202021%2C%20a,%25%20para%209%2C9%25>.



one" in quotes, right? We talk to many, but in fact in the recording we are not talking to anyone. So I feel a certain block with that. When I have a room full of students, I don't feel any blockage, but when I sit down to talk to a computer, [laughs], I feel a certain blockage. (Neo 01, 2022).

From this perspective, technologies are used as an extension of man and through it be used as a tool for access to another environment, the virtual one, a necessary aid to carry out an activity previously developed in the face-to-face environment for the digital one (McLuhan, 1974). It is the necessary means for action between territorialized and deterritorialized environments.

Neo 02 later carried out a training for the teachers of the Nebuchadnezzar Ship/school for the use of DICT in the ERE. Also according to the interviewee, nowadays he "works in many distance learning professional courses, but with classes already recorded. We call *offline*/not live." (Neo 02, 2022). This perception of asynchronous classes mediated by technologies made the teacher reflect on the teaching modality not being "purely face-to-face" but forming "a blended course" (Neo 02, 2022), this reflection was due to the experience of using these digital technologies during the advent of the COVID-19 pandemic.

About this experience reported by Neo 02, the interviewee Neo 03 (2022) says that she learned the use of the digital tool *Open Broadcaster Software (OBS) Studio*<sup>13</sup> for recording and editing video to be used *offline*. The teacher mentioned in the interview that she already had previous knowledge and that it actually resulted in an improvement in its use. "Where you train a lot or need to use the same tool a lot, you end up improving the knowledge you already had." (Neo 03, 2023). It is worth noting that this digital tool was not developed for education, but used during the pandemic in education.

The fact of knowing how to handle digital tools or learning new digital technologies, or having had contact with distance education before the pandemic were not enough factors to work in ERE, it required other skills, there was no didactic material, other teaching methods, technological infrastructure of the school, students and teachers and not simply reproduce what already existed in the face-to-face modality for the virtual one (Cavalcante, Lemos and Almeida, 2023). As Alves (2020) also points out, the predominance during this temporary period was, at first, an adaptation of what was previously carried out in person to the digital environment.

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<sup>13</sup> *Free software/program used for video recording and real-time broadcasting. Available at: <https://obsproject.com/pt-br/download>*

During his training at the technical level in electrotechnics at SENAI/RN, Neo 03 says that he used *software*/programs during the training course:

The software we used was the-- so much so that the ones that were within the training itself. So, the technician, for example, in electrical engineering, he develops-- In fact, he develops his capacity in various software. So there's AutoCAD<sup>14</sup>, there's FluidSIM<sup>15</sup>, there's MultiSIM<sup>16</sup>, there's SolidWorks<sup>17</sup> inside the university. So, the technologies, especially within the university, they are very integrated. You see a lot of things within CNC<sup>18</sup>, within PLC<sup>19</sup>, within graphic expression itself, and even more basic disciplines - They use a lot of software. Very. (Neo 03, 2023)

These *software* used by Neo 03 are not *software* to enable teaching, but digital tools for generating graphics, drawing floor plans, among other functionalities related to their initial training. That is, they are digital tools to enable practical teaching classes. At the Nebuchadnezzar Ship/school, according to Neo 03's report, some of this *software installed* on the computers in the computer lab of the Ship/school were already used, which were used in the electrical engineering technical course before the pandemic.

I use AutoCAD, which is one of the bases of the electrotechnical course here at the school, so the student has to leave here at school knowing, at least the basics of AutoCAD, which is that you draw a floor plan, you make an electrical project, all this you do in AutoCAD. We also use FluidSIM a lot for pneumatics and MultiSIM also for drawings, for electrical command diagrams and the like. We use it a lot. Other than that, I can mention the Office package more. We integrate all this here in the course. (Neo 03, 2023)

The Neo 02 and Neo 03 teachers portray recorded classes, with the use of digital tools, *offline*, due to the fact that the teacher is not present when the student is watching the video. The term *offline* referred to by the teacher, in this case, refers to the fact that the

<sup>14</sup> *Paid software/program* to create and develop geometric designs in 2D and 3D models with solid objects, surfaces, and mesh objects. Available at: [https://www.autodesk.com.br/products/autocad/overview?panel=buy&AID=12904993&PID=8299320&SID=jkp\\_CjwKCAjwlJimBhAsEiwA1hrp5sCGGe6NsT76asgwRfpqCUuU\\_aS46-ly6hleKMWFXt6Hh\\_RdJOS9xoCIUgQAvD\\_BwE&cjevent=d7ef12932efb11ee832705280a82b821&affname=8299320\\_12904993&term=1-YEAR&tab=subscription&plc=ACDIST](https://www.autodesk.com.br/products/autocad/overview?panel=buy&AID=12904993&PID=8299320&SID=jkp_CjwKCAjwlJimBhAsEiwA1hrp5sCGGe6NsT76asgwRfpqCUuU_aS46-ly6hleKMWFXt6Hh_RdJOS9xoCIUgQAvD_BwE&cjevent=d7ef12932efb11ee832705280a82b821&affname=8299320_12904993&term=1-YEAR&tab=subscription&plc=ACDIST). Accessed on: July 30. of 2023.

<sup>15</sup> *Comprehensive paid software/program for creating, simulating, teaching, and learning electropneumatic, electro-hydraulic, digital, and electronic circuits.* Available at: [https://www.festo.com/br/pt/e/educacao/aprendizagem-digital/simulacao-e-modelacao-virtual/fluidsim-id\\_1663056/?fwacid=c7d9224e7d7a2a87&fwakeyword=&gclid=CjwKCAjwlJimBhAsEiwA1hrp5jSnN\\_aZB9x\\_UOV5pAHoil4goBsNPJAU1qjg2fUth9NcRej1vaf\\_WxoCjjQQAvD\\_BwE](https://www.festo.com/br/pt/e/educacao/aprendizagem-digital/simulacao-e-modelacao-virtual/fluidsim-id_1663056/?fwacid=c7d9224e7d7a2a87&fwakeyword=&gclid=CjwKCAjwlJimBhAsEiwA1hrp5jSnN_aZB9x_UOV5pAHoil4goBsNPJAU1qjg2fUth9NcRej1vaf_WxoCjjQQAvD_BwE). Accessed on: July 30. of 2023.

<sup>16</sup> *Software/program* do project capture, behavior simulation and board layout definition. Available at: <https://multisim.informer.com/Download-gr%C3%A1tis/>. Accessed on: July 30. of 2023.

<sup>17</sup> *Software/program* that assists in the creation and innovation of projects in order to reduce the product development cycle from *design* to manufacturing. Available at: <https://ska.com.br/produtos/solidworks/solidworks-cad-3d>. Accessed on: July 30, 2023.

<sup>18</sup> Computer Numerical Control (CNC) System

<sup>19</sup> Programmable Logic Controller (PLC)

teacher has an infrastructure (digital space to store this class, cameras, microphone, platform for recording the screen and the class itself) that can record their classes and make it available to students. However, students, at some point in time, need to have an internet connection and digital electronic devices to have access to this type of content that is available on digital platforms or is transferred to them through other technologies, such as the use of social networks (*WhatsApp, Facebook, Instagram...*) and digital technologies that were often not developed for education itself, but were resignedified during the pandemic.

According to the reports of the three teachers, it is observed that all of them had already had training or experience in some digital tools. Neo 01 and Neo 02 had already worked in distance education, but Neo 03 says that he had never had contact with distance education before the pandemic, or with ERE: "My first experience with distance education was with the pandemic." (Neo 03, 2023), for her it was all very new. None of the three teachers, according to the reports, had ever taught from home, it was the first experience with remote work.

Neo 03, by the way, confuses the ERE and EaD modalities. The distance learning modality is supported by its own legislation, makes use of Virtual Learning Environments (VLE), has well-defined and structured teaching methodologies and practices that allow the feasibility of distance learning, which does not apply to Emergency Remote Teaching (ERE). Since, for ERE, the digital tools used were *Google Meet, YouTube, StreamYard* (which are not virtual learning platforms), digital tools that enabled the teacher and the class to have synchronous and asynchronous contacts. A variable interaction occurred when it was possible, that is, when there were technological means for it to occur. Another point to remember is that none of these meetings were face-to-face, all were remote during the social isolation imposed by the virus.

The ERE also required a greater effort from the student, in addition to the teacher, since in the private educational institution the course modality before the pandemic began was completely face-to-face and the sudden change demanded more from the student and the individual commitment of the teacher when adapting the existing material to the virtual one, when seeking a technological infrastructure to have access to the content and classes (Cavalcante, Lemos and Almeida, 2023). Trying to enter the Matrix and survive in it was a challenge linked to many variables that did not depend only on the effort of the student and the teacher.

Neo 02 says that the courses at the branch of the nave/school Nebuchadnezzar have always been face-to-face and that the peak of the nave/school would be in the year of the pandemic because two years have passed since its inauguration and the branch is reaching maturity and stability. However, as the character Seraph<sup>20</sup> (2023) reflects: "One thing I've learned in all my years is that nothing goes as we expect" (*Matrix Revolutions*, 2003). Neo 02 had no idea what was to come and reports: "the peak of the school would be in the year of the pandemic and then we had many difficulties, but we were able to overcome ourselves with the help that was given to the company and we managed to keep the teachers without firing anyone, thank God." (Neo 02, 2022).

One of the aids that Neo 02 mentions was decreed by Law No. 13,999, of May 18, 2020, by the Federal Government, which established a line of credit through the National Program to Support Micro and Small Businesses (PRONAMPE) (Brasil, 2020). This was one of the necessary fuels for the Ship/school to continue in orbit during the pandemic and for its future survival, which resulted in the non-dismissal of the school's employees. Law No. 13,999 was the breather that the Ship/school needed to continue in orbit. It should be noted that Neo 02's report about this moment is more supported by his management activity than by teaching.

Despite the training of the teachers and their previous experiences, it is observed that the challenge was not only to enter the front line in the Matrix, the Nebuchadnezzar ship/school needed to continue to orbit so that the teachers, as well as the administrative team, did not lose their jobs and the students did not miss classes, in addition, the preparation required for the operation of the school. The variables that emerged during the pandemic did not depend only on the previous performance and experience of the teachers, but on a set of factors so that it was possible to continue teaching, this was another variable.

In this context, the digital tools used by Neo and his crew members made this student-teacher interaction possible synchronously and asynchronously in a virtual environment. The mediation carried out by DICT and its use cannot be limited, it can be a great instrument for the democratization of teaching and access to information, as well as its reach, contributing directly to the development of education (Filatro; Loureiro, 2020; Gamboa, 2001). However, DICT require accessibility, infrastructure, digital devices from both the student and the teacher so that teaching is mediated, feasible and available to all.

<sup>20</sup> Secondary character in the film *Matrix Revolutions* (2003).

Neo 01 (2022) also observed during this period of ERE that despite the challenge, he learned a lot and was able to notice gaps and understand that he needed to "improve, even in the way of managing this virtual class". (Neo 01, 2022). There were times when the teacher felt stressed when recording the video classes, "In the beginning I made a lot of mistakes, I was going to record a video, then I made a mistake and stopped and deleted and did it all over again." (Neo 01, 2022). Despite this, the professor highlights the development of virtual teaching, as well as the teacher training necessary to work in this area.

I believe that virtual teaching will develop a lot and it is the market trend. You have, today, people who work, who don't have that much time to be inside a classroom, experiencing a face-to-face class and then they will opt for this modality. So the teacher has to start fitting into this new training there, of classes and wait for things to fall into place: student and teacher in the modality.

The classes were recorded by the *Google Meet platform* and made available to students, so that those who missed the content would not miss the content taught and so that everyone had the opportunity to watch again. Neo 02 describes that he not only used the *Google Meet platform* as a technological resource, he also used the *OBS Studio software* and the *Youtube platform*, as well as Neo 01 and Neo 03. That is, the classes were live, mediated by *Google Meet*, recorded using *OBS Studio* (used for screen recording) and then made available on the *Youtube platform*, through the teachers' channels, for the students.

"It was live. But I recorded. So the student who was missing, he had the availability to watch it later and then made it available on *YouTube*." (Neo 02, 2022). This is also how teacher Neo 03 (2023) reports "We recorded here at school, used the *OBS* program, which he recorded the screen with my voice and then I published it on *YouTube*, on a *YouTube channel*." and Neo 01 reiterates (2022):

I made some videos on *YouTube*, opened a channel, then took some classes on *YouTube* and posted them for them so that they could follow along. Because it's a way to get recorded for them, right, the material and they recycle it later, so some classes I managed to leave on *YouTube*...

In this context, teachers, when using digital platforms to make the class available to students. The pedagogical practice adopted by teacher Neo 03 for her disciplines was to record her classes, make them available and the students replicated what was taught in

practice with the use of the *AutoCAD software/program*. The professor explains how her disciplines were taught in the ERE:

Maintenance management is more theoretical, so apparently the students could understand little more and how the vast majority were the most of them. It was more relaxed, there were no practices, so you didn't have to develop any skills other than basically understanding the content, right? In the case of AutoCAD, we were unable to complete the course. Because there came a point in the discipline, that the student was no longer really able to develop. So, sometimes the program, as I said, AutoCAD, it is a program that it is paid for and its license is more than 2,000 reais. So who can afford the license?

These AutoCAD were recorded and then I threw the link to them at the time of the face-to-face. So they trained there, basically, at the same time as the class and the management was usually at class time, everyone attended. So if the class was Tuesday and Thursday, Tuesday and Thursday at 7 pm they were there. (Neo 03, 2023).

The teachers' reports reflect the concern with recording their classes, generating content, so that students would not be harmed in any way more than they already were, since at the Nave/school the classes were fully face-to-face before social isolation, when they had access to the *software/programs* necessary for the practices in the laboratories of the Nave/school.

Teachers were not prepared to abruptly assume several functions at the same time and in another environment, the virtual one. The teacher was not responsible for the creation of the ERE, but in some situations he was given the responsibility of acting in this space with the resources available in the market, for the continuity of teaching in the absence of specific training, there was not enough time, but only punctual training of equipment and software for its use during the pandemic, without planning and without a defined methodology for this context. (Cavalcante, Lemos and Almeida, 2023).

## FINAL THOUGHTS

The reality and experience with technological resources already acquired before the pandemic for these teachers facilitated their development and performance in virtual environments, although these resources were acquired by the teachers themselves, they already had them before the pandemic, it was not Nave/school that made all the resources available for them to be able to work in Nave/home. Although they had the technological apparatus and minimum infrastructure, the teachers reported that other resources were necessary to make the ERE viable, such as the adaptation of methodologies and teaching



materials, as the materials already developed were only suitable for their face-to-face work activities.

In addition to the challenges in adapting the materials and the methodology adopted in the ERE, the global pandemic state itself and the devaluation of teaching work bring other aspects to the fore. The ERE required a greater effort from the teacher in the face of several issues of materials, infrastructure, training. In this context, both (teachers and students) went through a period of adaptation to the reality in which they were inserted. The abrupt change from the physical to the virtual environment and the use of digital tools also reflect the student's effort in adapting to the ERE who previously only attended and participated in classes in the face-to-face teaching modality.

In the Matrix, the teacher had to adapt to the resignification of the ways in which he communicated with the students (Filatro; Loureiro, 2020) or the teacher innovated the pedagogical practice. The locus of action, during the pandemic, had to orbit in the homes of teachers, the *lockdown* caused by the Covid-19 pandemic causing the quarantine imposed by the virus, caused the Nave/school to orbit in several places. It has in fact invaded the homes of teachers and students with no prospect of returning, classes are definitely now fully remote.

It is possible to observe in this research, according to the teachers' reports, the impact of DICT on pedagogical practices, several aspects that changed the work of teachers and the experience of students, among them, the need for investment in technological infrastructure necessary for teaching to continue, the double working day, the lack of an environment at home suitable for remote work and the lack of training for ERE with the use of the DICT.

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