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# Parallel worlds: challenges for teaching and learning during and after the Covid-19 pandemic

**Emerson Mayk Cristiano dos Santos**

Universidade Federal da Paraíba (UFPB), João Pessoa, Paraíba, Brasil.
emersonmayk2.0@outlook.com

**Luciênio de Macêdo Teixeira**

Universidade Federal de Campina Grande (UFCG), Campina Grande, Paraíba, Brasil.
lucienio.macedo@professor.ufcg.edu.br

**Tânia Rodrigues Palhano**

Universidade Federal da Paraíba (UFPB), João Pessoa, Paraíba, Brasil.
taniarpalhano@gmail.com

**Abstract:** This article analyzes teachers' discourse on their own post-emergency remote teaching practices, considering the possibility of (dis)continuity in the use of digital technologies. The research was carried out through interviews with 17 teachers and analyzed using Gadamer's (1999) hermeneutic phenomenology and others. The results point to the continued use of digital technologies due to a new perspective of teachers regarding them.

**Keywords:** Digital technologies; Emergency remote teaching; Teaching practice.

## Mundos paralelos: desafios para ensinar e aprender durante e após a pandemia de Covid-19

**Resumo**: Este artigo analisa o discurso docente sobre suas próprias práticas pós-ensino remoto emergencial considerando a possibilidade de (des)continuidade no uso das tecnologias digitais. A pesquisa foi realizada por meio de entrevistas com 17 professores e analisada a partir da

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fenomenologia hermenêutica de Gadamer (1999) e outros. Os resultados apontam para a continuidade do uso das tecnologias digitais em função de uma nova perspectiva dos professores sobre elas.

**Palavras-chave**: Tecnologias digitais; Ensino remo emergencial; Prática docente.

## Mundos paralelos: desafíos para enseñar y aprender durante y despusés de la pandemia de Covid-19

**Resumen**: Este artículo analiza el discurso docente sobre sus propias prácticas post-Enseñanza Remota de Emergencia, considerando la posibilidad de (des)continuidad en el uso de las tecnologías digitales. La investigación se realizó mediante entrevistas con 17 profesores y se analizó a partir de la fenomenología hermenéutica de Gadamer (1999) y otros. Los resultados apuntan a la continuidad en el uso de las tecnologías digitales en función de una nueva perspectiva de los profesores sobre ellas.

**Palabras clave**: Tecnologías digitales; Enseñanza remota de emergencia; Práctica docente.

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## 1 INTRODUCTION

The technological advancement of recent decades has brought both burdens and benefits to all citizens (Castells, 2023). We can observe greater fluidity of information and more instantaneous interactivity among individuals, regardless of geographic distance (Lévy, 1999); we also see that certain daily activities have come to be performed more quickly due to new digital technologies, which have become ubiquitous for a large portion of the population (Santana, 2019). In contrast, the COVID-19 pandemic highlighted the difficulties of digital inclusion faced by less-privileged individuals who also depend on specific social spaces, such as the school.

Nevertheless, encouraging the use of digital technologies in the school context as tools to assist teaching practice is not something recent. Studies focused on this area have been published for some decades (Kenski, 2012; Moran, 2014; Valente, 2007), discussing their uses, limits, and possibilities, and even exemplifying how they can be used in a practical way in schools with few available digital technological resources (Luther; Gerhardt, 2018; Machado; Silva, 2023).

The COVID-19 pandemic made the position that digital technologies occupy in our daily lives even more evident, showing us how increasingly technological our society is, to the point that it became possible to continue school activities remotely through such resources. Mirroring various countries, Brazil adopted an exceptional and improvised model called Emergency Remote Teaching (ERT) to meet the demand imposed by the pandemic, a model that still requires deeper critical analysis. Many institutions and companies that already worked in person or in a hybrid format using such technologies did not feel as much impact from the change as the school, which for centuries has worked essentially through the face-to-face model.

This sudden change in work organization has caused significant impacts for both teachers and students, since it is well known that schools routinely work with physical models and resources rather than digital ones (Paiva, 2015). However, faced with the demands imposed by the pandemic and by education departments, educational professionals found themselves obliged to work remotely, using the most diverse digital resources even if they did not master them.

Based on this, we pose the following guiding research question: after the pandemic period in which all teachers were forced to use digital technologies in their pedagogical practices, do they still continue using them in their teaching practices or have they returned to the teaching models they used before the pandemic? In this sense, the proposed research aims to analyze teachers' discourse on their

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own practices, post-emergency remote teaching, considering the possibility of (dis)continuity in the use of digital technologies.

The COVID-19 pandemic and the consequent adoption of ERT catalyzed an expressive volume of research in the field of Education and Technologies. A significant strand of these studies focused on quantitative analyses and large-scale surveys, mapping access to platforms, the frequency of use of digital tools, and student participation rates (López, Meyer, & Santos, 2021). Another front of investigation prioritized the students' perspective, analyzing the challenges of learning at home, socioeconomic barriers, and the impact on mental health (Phillipps et al., 2022). Regarding teachers, much research has been dedicated to describing the difficulties faced and listing the most used technologies, providing a crucial descriptive panorama of the period.

Despite the richness of this panorama, it is noticeable that a considerable part of the literature has focused on the "what" and the "how much," considering which tools were used and with what frequency, with less depth into the essence of the teaching experience and the trajectory of pedagogical appropriation that followed the crisis. Few studies have focused on the nuances of teacher discourse to understand how teachers made sense of the forced transition to digital and whether this experience resulted in a lasting transformation in their practices. It is precisely in this gap that the present research is situated. Moving away from a purely descriptive approach, this work utilizes a phenomenological-hermeneutic lens to investigate not only whether teachers continued to use technologies but also how they interpret this continuity.

Thus, this study seeks to contribute to a qualitative and in-depth reflection on the subjective legacy of ERT in and from teaching practice before, during, or after the pandemic, bringing to light relevant questions and information not only for this research but also for the educational field as a whole.

## 2 RESEARCH METHODOLOGY

Since this research seeks to analyze teachers' discourse on their own post-emergency remote teaching practices, considering the possibility of (dis)continuity in the use of digital technologies (DT), the study at hand focuses on the subjective aspects and singular understandings of a diverse and plural group of subjects (basic education teachers). Thus, the qualitative nature of the research is

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evident, as it "[...] is concerned with aspects of reality that cannot be quantified, focusing on the understanding and explanation of the dynamics of social relations" (Silveira; Córdova, 2009, p. 32).

The study is also grounded in a bibliographic and descriptive approach, which, according to Bogdan and Biklen (1994), enables the researcher to utilize diverse instruments for data collection. These elements are added to various factors that can be observed, analyzed, and described to understand the phenomenon being researched, such as photo, audio, and multiple other data. To this end, we use field journals, recorders, scripts, and interviews to collect data, as well as academic productions from various authors who write about the area in question to corroborate or refute the collected discourses, thus understanding the analyzed phenomenon in a profound and critical manner.

Regarding data collection instruments, we used the semi-structured interview defined based on Fontana and Rosa (2023, p. 185), who describe it as

> [...] the most usual instrument in research in the field of Education. This is because it places the interviewer close to the investigated problem, thus allowing them to better understand the research object. It is considered a form of direct and intensive observation that [...] provides the interviewer/researcher with the opportunity to conduct a direct conversation with the target audience, in order to systematically/methodically collect information essential to the *purposes of the research*.

Thus, we selected the semi-structured interview for the research in question due to its characteristic flexibility, resembling a formal conversation (Gil, 2010). Since our intent is to provide the greatest comfort to the interviewee, these highlighted characteristics corroborate the objective of this study. Furthermore, in the semi-structured model, it is possible to obtain information about what the participants understand, aspire to, feel, or desire (Selltiz et al., 1972).

To conduct the interview, we developed a script to serve as a guide and as basis for the questions to be asked during the interviews. At this point, Richardson (2017, p. 189) characterizes the script as "a data collection instrument used to describe the characteristics and measure certain variables of a social group." This instrument provides guidance for the questions to be asked to the research subjects. Without it, we could feel lost during the interview, make the interviewee uncomfortable, and fail to obtain sufficient data for analysis. Table 1 presents the question script previously prepared for the interview.

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**Box 1 –** Question script for the semi-structured interview

| |
|---|
| Você já conhecia as tecnologias digitais na prática pedagógica antes da pandemia? |
| Antes da pandemia, você havia realizado algum curso sobre tecnologias digitais na escola? |
| Durante a pandemia, você realizou algum curso sobre as tecnologias digitais na escola? |
| Durante a pandemia, quais tecnologias digitais você utilizou para poder ministrar suas aulas? |
| Quais as dificuldades que você aponta para o uso das tecnologias digitais durante a pandemia? |
| Entre as tecnologias digitais que você utilizou durante a pandemia, alguma delas você pretende continuar usando neste período chamado de pós-pandemia? |

**Source:** prepared by the authors

Understanding that we were facing a unique and hitherto inaccessible phenomenon (Santos & Teixeira, 2022), we used phenomenology, with a focus on hermeneutics, for the process of analyzing and interpreting the data collected in the interview. Sanders (1982, p. 353) describes the phenomenological study as one that "seeks to make explicit the structure and implicit meaning of human experience." Larison (2021) adds that this experience is subjective and individual, being linked to the particular understanding each subject has of the world around them, leaving it to the researcher to observe and describe the phenomenon as it presents itself. Since we were dealing with the experience of subjects in a unique environment for them and aimed to describe and analyze it in this research, phenomenology is the method that best suits this study.

Phenomenology possesses a hermeneutic focus defended by Dartigues (1992, p. 132) when referring to research involving discourses, such as this one. The aforementioned author also states that "[...] phenomenological-hermeneutics must decipher the meaning of the text [...], this meaning that precisely conceals itself in the manifestation of the given [...] no longer contenting itself with being a description of what is presented to the gaze, but an interrogation of the given that appears."

Furthermore, the phenomenological-hermeneutic method enables a broader and more open analysis of knowable objects, allowing them to be studied from other perspectives without being limited to the results of this research (Gadamer, 1999).

Thus, Martins (1994, p. 26-27) establishes that:

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> [...] the phenomenological-hermeneutic method is characterized by the use of non-quantitative techniques, with critical proposals, [...] seeking to relate the phenomenon and the essence (eidós) [...] The validation of scientific proof is sought in the logical process of interpretation and in the researcher's capacity for reflection on the phenomenon object of their study.

In this case, we can note the direct connection with the study proposed herein, since, through the phenomenon upon which we focus, with the necessary methodological rigor, we can find presuppositions and, subsequently, scientifically proven results, yet without exhausting the results in themselves, thereby opening paths for other researchers to follow, bringing new data and perspectives from other realities.

The hermeneutic principle is better suited to this research because its methodological approach is characterized through what Coltro (2000) compares to a metaphor represented by a circle of interconnected activities that have no end yet provide the basis for continuation. Thus, the analysis process followed the exercise also proposed by Coltro (2000), consisting of three stages: (1) general listening of the interview recordings; (2) secondary listening with separation and grouping of data; and (3) analysis and interpretation of the separated and grouped data.

Thus, it should be noted that phenomenological-hermeneutic research is directed toward a bias of signs, objective expressions, and the perceptions that subjects hold regarding the knowable object of the research, given that such subjects can express their responses freely. Meanwhile, the researcher is interested not only in the data obtained but also in the signs and meanings that are imprinted or hidden and attributed by the research subjects (Martins & Bicudo, 1989).

Regarding the research locus, we obtained two schools that are part of the Municipal Network of Guarabira, a city located 98 kilometers from the capital of Paraíba and 100 kilometers from Campina Grande. The municipality is seen as a university hub because it is home to several private higher education institutions and serves as the seat of Campus III of the State University of Paraíba, which houses programs in the Humanities. These universities are responsible for the training of a large portion of the teachers in the municipality in question and its surroundings.

The research was conducted with teachers who taught the 9th grade of final years of elementary education in the two schools. The choice of the region was based on two criteria: the first is related to the fact that the city represents a regional hub, being the second regional education management office of the State of Paraíba; and the second is related to geographical accessibility, given the ease of travel for data collection. The choice of the 9th grade was due to it being the final

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stage of elementary education before the transition to high school, which is frequently analyzed by external assessments such as the Basic Education Evaluation System (Saeb). Thus, one of the criteria was that they taught the 9th grade, regardless of the subject they taught.

The choice of schools was based on the results of Saeb 2019. Based on the released data, the researched schools were those that achieved the best evaluation results. Thus, we used as an inclusion/exclusion criterion the factor: best performance in Saeb 2019.

At school A, there were 12 teachers teaching in the 9th grades, 9 of whom agreed to participate in the research. Of the 3 who did not participate, 1 was on leave for personal reasons and the other 2 did not wish or show interest in participating.

Meanwhile, at school B, we encountered a total of 19 teachers in that grade. Of these, 8 agreed to participate, while the remaining 11 declined or did not show interest. Furthermore, some individuals were on personal leave, and others were excluded because they had only recently been tenured, not fitting the criteria for a study that addresses the periods before, during, and after the pandemic.

Consequently, we reached a total of 17 participants out of 36 invited, representing approximately 47% of the population. Interviews were conducted either in person at the school or remotely via the Google Meet platform, with the choice of setting left to the discretion of each participant. All interviews were audio-recorded and subsequently transcribed.

It is worth noting that only a few accounts are presented in the body of this article, without exposing the identity of the subjects in question in any way. All statements are labeled as "anonymous." The selection of the testimonies appearing in the main text was based on the criterion of similitude. We observed that there were always two groups of testimonies: those presenting affirmative or negative ideas. The accounts of the participants in each group were consistent with one another; consequently, we realized that any given account would encompass the perspective of the others.

Furthermore, because this research involved human subjects, it underwent all procedures related to the Ethics Committee of the Alcides Carneiro University Hospital (CEP/HUAC). Accordingly, all participants signed Informed Consent Form (ICF) and received their copies. The administration of both institutions authorized the research and signed the Letter of Agreement.

We also emphasize that the transcription of the interviews was done verbatim (exactly as the subjects spoke); therefore, some grammatical and agreement deviations may be found in the texts referring to the interviewees' speech. Finally, it is worth highlighting that the field research in question

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addresses the pre-pandemic and pandemic periods with the aim of analyzing the general context in which the interviewed subjects were involved, to then evaluate the possibility of continuity in the use of digital technologies in teaching practices.

## 3 RESULTS AND DISCUSSIONS

In this way, we began the interview following the order of questions established previously (Box 1) and will proceed with the discussion in the same sequence.

### 3.1 Knowledge regarding resources, access, uses, and training before the pandemic

Out of the 17 participants, 12 responded that they had never used digital technologies in pedagogical mediation before the pandemic, nor had they had access to any kind of information on the subject; meanwhile, 5 stated that they had some form of access and had already experienced them in their practices. This is evident in the participants' statements, as they said, for example: "[...] everything I know today in terms of online classes, remote classes, of ICTs right, which is the term being heavily used, I learned starting from the pandemic" (anonymous).

As seen in the statement expressed above, there is an abrupt transformation in teacher knowledge resulting from their experiences and lived realities, triggered by the pandemic. This was neither planned nor intentional, occurring instead in the face of a pressing need. This abrupt transformation is noticeable through the clear demarcation the interviewee makes between "before" and "after" the pandemic. For the respondents, there was no sense of continuity, but rather a break. Not only does the statement by the subject in question highlight this, but other studies, such as that by Alencar et al. (2025), also point out this forced manner in which teachers had to deal with digital technologies during the pandemic and learn from them.

Regarding the subjects who claimed to have taken some type of course before the pandemic and/or who already used certain resources in their practices prior to it, what became perceptible is that this practice was reduced to sporadic situations, as shown in the following statement: "I used it, right, for both for research and for assessment, an activity" (anonymous). Another interviewee replies with something similar by stating: "before the pandemic, I used them at a lower frequency. Google Forms

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for activities, Kahoot as well as a gamification platform for content, I think mostly these two" (anonymous).

The statements point not only to sporadic experiences but also to a merely technistic and instrumental use, applied to specific tasks (research, assessment) rather than in a critical and pedagogically reflective manner. In this regard, Strickert and Pereira (2025, p. 1) state that "the use of digital technologies in the teaching and learning process demands more than technical mastery from educators: it requires a pedagogical understanding of how to integrate them intentionally and meaningfully into teaching practice." Even the temporality of the statements refers to a context of usage driven by immediate demands and low utilization.

In the statements presented, the pre-pandemic period emerges as a scenario in which digital technologies remained on the sidelines of teaching practice. There was no true appropriation of the mastery and use of these resources as something intrinsic and integral to teaching work; rather, their use was distant, uncritical, and instrumental. However, the pandemic triggered a disruption in this inertia, not only introducing new practices but also exposing the vulnerabilities of teacher training and performance regarding technologies, even though legal documents such as the National Common Curricular Base (BNCC), the Guidelines and Framework Law for National Education (LDB), and others had already postulated for all these aspects for some years.

In this regard, Alarcão (2022), as well as Magda Soares (2002), emphasized the need to foster digital literacy processes among students. To achieve this, Matos et al. (2024) draw attention to the necessity of undergoing the same process with teachers. Prensky (2011) states that any pedagogical innovation, whether permeated by digital technologies or not, only occurs when the teacher knows, masters, and desires such innovation. Therefore, the lack of knowledge or mastery of such tools rendered their use prior to the pandemic practically non-existent for most of the surveyed subjects. Even among the few subjects who stated they had prior contact with these technologies, the accounts point to a very limited usage. This perspective is corroborated by Braga (2013, p. 15), who notes that:

> The development of digital literacies through school activities seems essential in the current era, in which the internet increasingly occupies a prominent social space, whether as a source of information and/or a means for constructing knowledge, or as a space for cultural expressions and social interactions of various kinds.

Currently, what we perceive when walking down the street and entering social environments is a technological ubiquity. For Coll and Monereo (2010, p. 46), ubiquitous technology "refers to the

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progressive interaction of computer media into the different contexts of human development, in such a way that they are no longer perceived as distinct objects." In this scenario of a hybrid society, the challenge arises for schools to prepare their students (and, prior to that, their teachers) for the context of this new reality.

It is important to highlight that not everything can be placed solely on the teacher's responsibility. Many of these professionals have been in the classroom for years and underwent initial teacher training that did not encompass discussions surrounding the field of digital technologies in the classroom (Santos, 2019).

Continuing education, which is foundational for the flourishing of new pedagogical ideas, is still permeated by difficulties and obstacles that affect the the teacher's ability to be present and participate in this moment (Silva, 2024). Furthermore, the interviewees themselves point to difficulties regarding continuing education, stating, for example: "I participated in a course, but I could not finish it because it had in-person meetings and sometimes the administration would not grant time off" (anonymous). Another interviewee responds: "we had training over at the Polivalente school, yeah, like, on how we should use these new technologies [...], but this course was not prolonged. It started, but then the teachers got discouraged and so we didn't do the course" (anonymous). Furthermore, the precarious technological infrastructure to which many institutions are subjected can also be included as a factor for teachers not developing a more attentive look toward the possibility of using these tools before the pandemic (Ribeiro, 2023).

### 3.2 Uses and training during the pandemic

When asked whether they had completed any course, workshop, training, or something similar during the pandemic regarding the use of digital technologies in the teaching and learning process, we obtained two types of responses: affirmative and negative. One of the interviewees reported: "the State facilitated this for teachers, so yes, we had it, we were supported in that sense, online training, lectures, and courses were provided [...]" (anonymous). This statement indicates that they received training provided by the State or municipality also appeared in other interviews, such as: "yes, we did, but well, online meetings with the department staff, though I wouldn't call it a course. In fact, we were thrown to the lions, and each teacher had to manage on their own, that is the truth" (anonymous).

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The initial accounts suggest a distinct perception regarding the role of government spheres. While the statement about state-level support indicates a sense of welcoming and assistance, the discourse concerning the municipal sphere points to a perception of non-existent help.

> As soon as the pandemic was declared, you know, by the WHO, the State Government suspended classes and immediately, I think within a week, two at most, then this course started for us to get an idea of some technologies we were going to use, especially on Google Meet which was to fit into online classes, but from the city government we had no support, we had no course, we had nothing. (anonymous).

Another interviewee corroborated this statement:

> The State conducted training on the Google platform, right?! Especially focused on Google resources, which was what they offered. So how to work with Google Forms, Meet, those things [...]. If I weren't a State teacher, I wouldn't have had this training, so I was teaching in the municipality without having had this training. Unfortunately, the municipality of Guarabira did not offer us training. (anonymous).

In Brazil, there was no guidance regarding the type of methodologies or resources that should be used by teachers in their classes (França; Benite, 2023). Nor was any nationwide training provided to teachers facing this new educational context. Furthermore, many schools lacked digital technological resources before or during the pandemic, and there were few previously trained professionals, if any. This highlights an initial difficulty for teachers in this pandemic scenario (Souza; Silva; Cabral, 2021).

In this sense, Silva (2024, p. 74) clarifies the importance of continuing education by stating that it is

> [...] widely recognized as an essential tool for enhancing teachers' pedagogical skills. Through this process, educators have the opportunity to acquire new strategies and approaches that improve the quality of instruction. From this perspective, continuing education enables teachers to develop the necessary competencies to promote student learning in an effective and meaningful manner.

Corroborating the above, Candau (1997) offers observations into the importance of a solid initial teacher training that is firmly grounded in elements closely aligned with school reality, such as the presence of digital technologies in the classroom. This point is also reinforced by other authors, such as Libâneo (2015, p. 77), who notes that:

> Facing new realities and the complexity of knowledge currently involved in their professional training, teachers would need deeper theoretical preparation, operational capacity regarding

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> professional demands, [...], in addition, obviously, to the indispensable adjustment of salaries, working conditions, and professional practice.

In contrast, Tostes et al. (2018, p. 89) consider that, although there is an ongoing discussion regarding the importance of contextualized continuing teacher education on contemporary topics, the devaluation of the profession, low salaries, pressure to meet excessive targets, large class sizes, and other factors are sufficient to demotivate teachers in pursuit of their own professional development. Furthermore, the continuing education offered is often disconnected from the reality experienced by the school and its subjects.

Moreto (2020) analyzes, based on the logic and documents of the World Bank (an institution that also invests in continuing teacher education in the so-called "Global South"), that there is a technical rationality that does not advocate for the actual interests and needs of teachers and schools. Bastos and Rocha (2017), upon analyzing the World Bank's public documents regarding the desired education for underdeveloped countries such as Brazil, observe a purely market-driven and welfare-oriented intention being advocated by the bank. This logic, tied to a purely rational and technical view of digital technologies in education fostered by such institutions, causes delays and setbacks throughout the educational process, including in initial and continuing teacher education, reverberating directly in teaching practice.

In addition, the participants' statements regarding the lack of training provided during the pandemic reveal a fragility not only of the educational system, but especially of the departments of education, which are also essentially responsible for providing training, study, and research to the teaching staff on current topics, as postulated by Silva (2024). In a context of rapid and significant changes, such as Emergency Remote Teaching (ERT), more effective preparation aligned with the prominent reality unfolding would have been necessary. In this process, adequate training would be required, demonstrating, for instance, the technologies imposed on them and their full potential for use, so that the teaching staff could acquire the essential theoretical and practical preparation regarding the use of digital technologies as mediators of the teaching and learning process. Delors (2018) characterizes teaching as a social function that demands continuous education and constant updating, arguing that practicing teachers need, at regular intervals, theoretical deepening regarding their own pedagogical practices so that they can address as much as possible the social complexity of the school context in which they operate.

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### 3.3 Difficulties in using digital technologies during the pandemic

Regarding the difficulties faced by these professionals, the responses obtained can be categorized into three aspects: (1) students' lack of access to resources; (2) the teachers' own low-quality internet connection; and (3) the teachers' lack of knowledge/mastery of digital technologies and resources. In this regard, one of the research contributors explains:

> There were students who participated, very few students participated, and the students who unfortunately didn't have the means, a cell phone, because they didn't have internet, because of one thing or another, sometimes they had to pick up this material, editable material at school to take home. So in this material we had the whole script [...] how these activities would be developed [...], for them to take home. (anonymous).

This statement is corroborated by other interviewed subjects, as highlighted by one of them who says:

> And the issue of students' difficulty in having internet to be able to access the links. So that was also a major difficulty in achieving knowledge transmission, in being able to pass knowledge on to students. So, they suffered a very significant loss with the pandemic, mainly because of the lack of internet that many didn't have. (anonymous).

In the two cited excerpts, we can see how the interviewed subjects address the issue of the learning deficit generated in students during the pandemic period, since a portion of these students lacked the minimal necessary tools to follow the classes. The study conducted by Santos and Rodrigues (2023) reinforces this idea, pointing out how the pandemic affected students' learning, not only due to social distancing but also because of the absence of technological resources that would allow them to connect, even if virtually, with peers and teachers to continue learning. In addition to this, other studies corroborate such a claim.

> When considering the current scenario of the Brazilian population, the lack of access to technological resources is notable, which consequently prevented or hindered a large portion of the population, specifically the most marginalized segment, from exercising their constitutional right to education. During this period, socioeconomic disparities between groups were aggravated, since individuals who already lacked access to electronic communication and entertainment devices were also partially deprived of continuing their formal education (Phillipps et al., 2022, p. 410).

There are many factors behind this lack of digital technologies among students, who essentially come from low-income families and rural areas, surviving on low-wage jobs and needing

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to prioritize certain aspects of their lives, as buying a computer or cell phone and installing an internet provider in their homes do not end up being among those priorities (Bartholo et al., 2023).

Even a study conducted by the Institute for Applied Economic Research (Ipea) revealed how the pandemic laid bare the economic and social inequalities of the most marginalized populations by evidencing that both schools and students themselves lack access to sufficient technological resources to keep up with the pace of remote classes (Kubota, 2020).

As previously mentioned, the teachers' own low-quality internet connection was also highlighted by the interviewed participants as a major obstacle to the continuity of emergency remote classes, as illustrated in the following statement:

> The internet [...] is terrible. You would be teaching and suddenly your internet would drop, suddenly it would start lagging, even if you had a good laptop, even if you even if you knew how to use it, the internet just didn't help. So the biggest difficulty for me was the internet issue; it got in the way a lot. (anonymous).

We identified this same problem in other accounts, such as: "I changed providers about two times because, since everyone was in the same situation and I live in an apartment, in a condominium, right, so many people were using it and sometimes the internet wouldn't cooperate" (anonymous). On platforms like Google Meet, which enable video conferencing and screen sharing, internet issues can lead to participant disconnections, bugs, freezing, and other obstacles, since having a high-speed internet connection is a prerequisite to fully utilize all the platform's available resources.

Finally, the third aspect highlighted by the interviewees regarding their difficulties during the pandemic refers to their own lack of knowledge about digital technologies and their resources, as well as the absence of technical support to assist them with questions and suggestions. This assertion is based on statements such as:

> [...] I was not familiar with technology; I didn't use it. I suffered [...] a lot to learn and to be able to teach online classes. [...] My niece helped me; she was right there by me the whole time. So when I started, we didn't use Google Meet, right, I didn't know how to handle this tool. So it was complicated, it was difficult. [...] The first time a student joined playing pornographic songs, I didn't know how to remove him from there, so my niece was right nearby. (anonymous).

Another subject notes:

> Skills that I didn't have as much, we developed more during the pandemic. Before, I was used to using a laptop in the classroom, the Datashow, a speaker, but in the classroom, right, with the help of the school staff—we have a team that provides support during class when

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> something goes wrong, so I always have someone there to come to the classroom and help me out, and during the pandemic, no, it was just me, right? If something went wrong, I had to manage on my own. (anonymous).

In this line, Mazzone (2007) points to the issue of technological fluency required of teachers to navigate spaces in the so-called Information Society (Bell, 1974) or Technetronic Era (Toffler, 1980), etc. Alarcão (2022) also emphasizes computer literacy for students and teachers toward fluid communication and contextualized learning; for this to happen, it is necessary to overcome the difficulties that still persist regarding teacher training in response to this demand.

It is likely that these teachers were already using such digital technologies in their personal lives, whether for social media and entertainment or for studying and conducting research. However, the realization that these technologies can play roles in the teaching and learning process is something that may well have gone unnoticed by many, as pointed out by Bartholo et al. (2023).

It is important to emphasize that although teachers bear responsibility for their professional development, it is not solely up to them. Other agents are equally responsible for it, such as departments of education. Furthermore, one must still consider factors such as the infrastructure of schools and of students themselves, social inequalities, the inappropriate or distracting use that students make of these resources, and, more recently, the prohibition of the use of certain digital technologies in the classroom, such as smartphones, by the Ministry of Education and Culture (MEC).

Along these lines, Schuhmacher, Alves Filho, and Schuhmacher (2017) draw attention to the fact that without knowledge and mastery of technique and resources, results in teaching practice would hardly be achieved. Nevertheless, Kenski (2012) emphasizes that teaching practice is not limited to technical mastery alone but also implies the pedagogical appropriation of these elements so that the inclusion of digital technologies in teaching practice is not restricted to technicism, utilitarianism, and technical rationality, that is, mere informationalism. Therefore, teachers require a deep theoretical and practical understanding to engage with such elements in a critical and reflective manner.

### 3.4 The use of digital technologies in the post-pandemic period

Given the situations previously reported by the interviewed subjects, we questioned whether, despite the difficulties encountered, with the return to the in-person model and the absence of a mandate to keep using such resources, they intended to continue utilizing digital technologies in their

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practices. Of the 17 interviewed subjects, 12 claimed not only an interest in using them but also noted that they never stopped using them.

> Yes, absolutely. [...] I already make use of them, for example, sometimes I do an interactive activity with them using their cell phones since they have them available nowadays, a speaker—today I carry one inside my bag to work more with music, right. [...] Since today they already have more skills with technology, sometimes I hold classes via Meet, a reinforcement class when they need it, so I schedule one or two classes a month to work on reading and text production, and WhatsApp stayed. We use it a lot today, much more than before with them. (anonymous).

Other subjects also report continuity in the use of digital technologies in their teaching practice even after returning to the fully in-person model: "they are useful and we continue to use WhatsApp groups. [...]. But I continue using the idea of forms, of some quizzes that we can do through tools other than just writing on the board, right" (anonymous). Another research subject also states:

> [...] I have a WhatsApp group for each of these classes [...] And even today we send materials. [...] It's called [...] hybrid learning, which mixes in-person with (virtual). [...] I do an activity, an exercise, you know? So [...] when I didn't have this resource, I had to write it on the board, wasting time; now, for example, I send the assignment, send the answer at night to them, and the next day I'm just going to discuss it—I don't keep copying on the board anymore, I simply engage in debate. (anonymous).

Based on the accounts presented, it is evident that these participants indeed continue to use certain tools in their daily practice, some more frequently than others. We observe a more frequent rise in the use of specific resources, such as the mobile application WhatsApp. Its functionalities are broad enough to encompass numerous tasks that comprise school activities, but in a faster and more dynamic manner, such as sharing instant messages, photos, videos, audio files, and more. One of the interviewed participants describes their post-pandemic use of the app: "We kept using the (WhatsApp) groups [...] for the classes. So, when there are seminars on the subject I teach, we post them. When there is a need to bring materials, like 'everyone bring this.' [...] Assignments that are posted, clarifying doubts, those kinds of things." (anonymous).

Negrão and Neuenfeldt (2024) conducted research on the use of WhatsApp as a pedagogical tool in ERT, their research conclusion is that the application enables the sharing of content in various formats (audio, text, video, PDF, and others) in an easy and agile manner through the creation of groups that currently have a capacity of nearly 1,024 people. Within these groups, participants can reply to a message, which can be a question, to be answered as a form of activity, evaluation, or feedback. Thus, we see several "benefits that the use of the WhatsApp application can offer to various

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levels of Basic Education, without losing sight of student reception and affectivity, which are often questioned or relegated to the background" (Negrão; Neuenfeldt, 2024, p. 8). Other benefits made possible by this resource include accessibility, immediacy, and interactivity (Iahnke et al., 2013), which corroborates the statements of Moran (2014), Oliveira (2023), and Kenski (2012) regarding the potential that digital technologies possess when coupled with the teaching and learning process.

In addition, Google Forms is highlighted by the participants as a tool that is highly adaptable to pedagogical practice, with strong adherence among teachers and students, and which facilitates student assessment and feedback processes. It was cited by the research participants as one of the digital technologies they continue to use even with the return to the in-person model: "We used to create tests for the students, they were at home, so I would go there, create my tests, send them the test link or an activity, they would answer it, and everything came back graded on the spot [...] I loved that. I loved it. [...] After I learned how to use it, I used it all the time" (anonymous).

Almeida et al. (2023) highlight how this resource can be interesting in teaching practice due to its versatility and free availability, as the creation of customized forms, assessments, and instant feedback can enhance the evaluation process. Pelages et al. (2024, p. 6) emphasize that this tool "is particularly useful for carrying out gamified activities, which make learning more dynamic and engaging." Gamification is a strategy that captures key elements of games, such as challenges, levels, rewards, and others, to motivate students, promoting meaningful engagement in classes (Oliveira, 2023). In this way, Google Forms enables the combination of these strategies to produce a more dynamic lesson and personalized assessment (Pelages et al., 2024). This resource is noted in the interview as another one that continues to be used in the post-pandemic period.

Other websites and applications are mentioned by the teachers who used them during the pandemic and intend to continue using them in the post-pandemic period, such as Kahoot!, Padlet, and Classroom. The first two are respectively highlighted by some subjects as tools they continue to use in their practices after the return to the in-person model. One of the interviewed participants points to the use of Kahoot! in an adapted version for the classroom without the need for an internet connection, while Padlet is used as an out-of-class activity. This becomes evident in statements such as: "I still use Forms a lot, I still use Kahoot!, I use apps like Canva a lot, I ask the students to research poems and publish them on Padlet, I still use them frequently" (anonymous).

It is noted that even with the return to the fully in-person model, without the mandatory use of digital technologies due to the end of the pandemic, teachers chose to continue using these resources

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and tools because they found in them ways to facilitate their teaching processes and make the learning process more dynamic, enabling greater student participation and interaction, as students feel more connected to the school when it is aligned with their realities (Pimenta et al., 2021). From the subjects' accounts, it is evident that many of them are using digital technologies within a flipped classroom perspective. A methodology characteristic of hybrid learning and active methodologies that became quite popular during the pandemic, although it is a discussion that predates it.

Even with the end of the pandemic and no requirement to use digital technologies, we note that some subjects still experience significant difficulty using these tools and, despite viewing them as useful resources for pedagogical practice, still choose not to use them. This is reflected in the statements of participants who reported not using these resources in the post-pandemic period. For example: "If necessary, I would use classes via Meet. [...] If there is a project, a specific need, I will use it, but not right away, no." It is clear from this account that the participant in question is open to using digital technologies in the post-pandemic period but only conditional on a specific need or adverse and imposed circumstance, showing no interest in using the tools simply for the pure potential they offer.

The study by Pacheco and Lopes (2019) reflects on this possible resistance from some teachers regarding the use of digital technologies in their practices. In this regard, Paiva (2015, p. 1) considers that in education, "when new technology emerges, the first attitude is one of distrust and rejection." Libâneo (2015) corroborates this assertion by arguing that innovating, with or without digital technologies, requires stepping out of one's comfort zone, which can be difficult for some teachers. In any case, it is observed that a significant number of subjects not only consider using digital technologies in their post-pandemic practices but actually continue using them regularly under various circumstances and through multiple resources, tools, and platforms.

## FINAL CONSIDERATIONS

Several authors point out the need for schools to adapt to this new technological reality, incorporate tools and resources that students already possess, and redirect their use in a more didactic, diversified, and pedagogical sense. Digital technologies are intrinsic to our daily lives. Teachers themselves already use them in a personal capacity. Now, it is necessary to visualize the possibility of using these technologies in a pedagogical capacity with students.

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Through the research at hand, it was observed that most of the interviewed subjects share this same view and feel motivated by the possibilities of use that digital technologies can provide in their teaching practices, in their pedagogical processes, and even in their pre-class activities, such as in lesson planning, assessment, and research.

Recognizing the potential that digital technologies possess is a fundamental step toward a renewal in pedagogical processes, so as to include in the daily routine of classes both in-class and out-of-class activities involving the technology that is already in the palm of students' and teachers' hands. Teachers themselves recognize that digital technologies can bring about a significant change in their practices and in students' interest in classes, as they enable a wide range of activities and resources.

Through, for example, virtual resources such as Kahoot!, mind maps, and other applications and games presented by the interviewed teachers, students achieve a more fluid and dynamic learning experience. With the help of these tools, student learning can grow significantly, as they interact more when connected to a virtual network.

With this study, we do not intend to focus excessively on the positive side nor present a narrative of success and emphasis on digital technologies. The research in question highlighted gaps and problems in the teaching and learning process that need to be explored.

We saw that one of the main difficulties pointed out by teachers regarding the use of digital technologies in the classroom before and during the pandemic was precisely the lack of knowledge and skill regarding the tools imposed upon them. In this case, the pandemic period was sufficient for these teachers to develop, even if abruptly, some skills to move forward in the post-pandemic period.

We can also conclude on the importance and encouragement of continuing teacher education as an aspect of significant importance. It is through this means that teachers can stay updated in the face of new social and professional demands that arise routinely. However, one must consider the challenges involved in this process. Based on the analysis of the interviews, it was observed that these teachers do not have sufficient time and opportunity to engage deeply with fields of knowledge that they themselves recognize as important and fundamental to their teaching practices.

It is also necessary to acquire the inputs necessary for pedagogical action permeated by digital technologies. The perception of abandonment and the description of a precarious infrastructure were central points in the teachers' discourse, suggesting that historical investments in the field may not have been sufficient to prepare schools for a crisis of such magnitude.

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Furthermore, initial teacher education also needs to be constantly problematized. It is known that courses focused on the field of digital technologies are already a reality, but to what extent do these courses truly promote a critical and contextualized understanding of the use of digital technologies in teaching and learning processes? This is not a reflection that this research intended to verify, but we bring them into this study as a way to open the way for new research building upon this one.

In addition to the role of teachers and schools, other actors are equally responsible for improving this didactic-technological process in the political sphere. Although there is legislation addressing the need for technological inclusion in schools, this does not always translate into practice. These policies place an excessive burden on teachers and schools, while offering very little in return. Furthermore, the socioeconomic inequality among students remains latent and directly impacts the learning process. Finding ways to mitigate this reality must also be a primary focus of public policies.

Thus, within the researched context, a change in the teaching and learning processes is perceived. However, it must be considered that the researched subjects did not fully and completely appropriate the use of these resources in a critical, reflective, and pedagogical manner, but rather a merely practical one. Nevertheless, teacher fatigue, devaluation, and digital burnout, although topics not previously addressed in this research, may appear in the future and lead to the weakening of practices permeated by digital technologies.

Finally, we return to the general research problem posed by the following question: after the pandemic period, during which all teachers found themselves forced to use digital technologies in their pedagogical practices, are they still using them in their teaching practices, or have they returned to the teaching models they used before the pandemic? Based on the discussion conducted in this research, it is evident that most of the participating teachers not only state their intention to use the tools but also report that they never stopped working with digital technologies.

Although we cannot generalize the data and analyses found in this research to all other school realities in Brazil, we view these subtle advances favorably. We know that the challenges permeating a teacher's work across all possible contexts are numerous. It is necessary to constantly reflect on our own practice in search of meaningful changes. It is hoped that this research does not end in itself, but rather paves the way for future studies. Thus, "I ask only that we remain open, benevolent, receptive to novelty. That we try to understand it, as the real issue is not being for or against it, but rather recognizing the qualitative changes in the ecology of signs" (Lévy, 1999, p. 12). Finally, we

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