

The Basic Education Teacher and the Digital Technologies in Emergency Remote Teaching

O Professor da Educação Básica e as Tecnologias Digitais no Ensino Remoto

ISSN 2177-8310
DOI: 10.18264/eadf.v12i1.1666

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Abstract

This article aims to analyze the perception of elementary school teachers about their practices and remote teaching, which was implemented in an emergency due to the Covid-19 pandemic. It is a survey, in which 46 teachers participated when answering a form with 17 closed questions and an open one about this experience, the digital technologies used, the difficulties in this implementation, the access to the internet, among others. The participants identified messaging applications (WhatsApp and Telegram) as the most used tools in class, being considered the easiest, and the posture of permanent learners was observed in them.

Keywords: Elementary school. Digital technologies. Emergency remote teaching. COVID-19 pandemic.



Received: 11/22/2021
Accepted: 04/13/2022
Published: 04/19/2022

COMO CITAR ESTE ARTIGO

ABNT: DAVIS, I. A. *et al.* The Basic Education Teacher and the Digital Technologies in Emergency Remote Teaching. **EaD em Foco**, v. 12, n. 1, e1666, 2022. doi: <https://doi.org/10.18264/eadf.v12i1.1666>

*Resumo***O Professor da Educação Básica e as Tecnologias Digitais no Ensino Remoto**

Este artigo se propõe a analisar a percepção de professores da Educação Básica sobre as suas práticas e o ensino remoto, implantado de forma emergencial devido à pandemia da Covid-19. Trata-se de um levantamento, do qual participaram 46 professores que responderam um formulário com 17 perguntas fechadas e uma aberta sobre essa experiência, as tecnologias digitais utilizadas, as dificuldades nessa implementação, o acesso a internet, entre outros. As participantes identificaram os aplicativos de mensagem (WhatsApp e Telegram) como as ferramentas mais utilizadas nas aulas, sendo consideradas as mais fáceis. Observou-se neles a postura de permanentes aprendizes.

Palavras-chave: Educação básica. Tecnologias digitais. Ensino remoto emergencial. Pandemia Covid-19.

1. Introduction

At the beginning of the new coronavirus (COVID-19) pandemic in Brazil, the Ministry of Health published Ordinance N. 356 of 11/03/2020, which regulated the provisions of Law 13.979/2020, about the measures for facing the international public health emergency. After that, several legal devices were published, among them the Ministry of Education's Ordinance N. 544 of June 16, 2020, in which the face-to-face classes were replaced by digital classes, in accordance with the CNE/CP Opinion No. 5/2020, which reorganized the school calendar, allowing the calculation of non-face-to-face activities for the purposes of fulfilling the minimum annual workload.

In this sense, there was an urgent need for adaptation in education in order to accompany such transformations. Among them, the Emergency Remote Education (ERE), which was characterized by the change in face-to-face teaching and learning processes for alternative technologically mediated models with the main purpose of allowing students to continue their studies due to the interruption of face-to-face activities due to the pandemic (HODGES *et al.*, 2020).

In ERE, the class takes place in synchronous time (following the principles of face-to-face teaching), with video lessons, lecture by web conferencing system, and the activities follow during the week in the space of a virtual learning environment (VLE) asynchronously. The physical presence of the teacher and the student in the face-to-face classroom space is "replaced" by a digital presence in an online class, which is called 'social presence' (BEHAR, 2020, paragraph 5) (free translate).

Although also conducted in digital media, the ERE cannot be confused with the Distance Education modality (EaD, in Portuguese) established in Brazil in Article 80 of the Law of Directives and Bases of Education (LDB No. 9.394/96), since its implementation requires planning, investment in infrastructure and teacher training (JOYE, MOREIRA, ROCHA, 2020). Moreover, regarding its occurrence in Basic Education, EaD is legally provided for Elementary and Secondary Education and not for Early Childhood Education, as occurred in the school year of 2020 in Brazil, in which 91% of teachers of Early Childhood Education and the early years of Elementary Education were working remotely (ALFABETIZAÇÃO EM REDE, 2020).

Another aspect to be highlighted is that EaD is a practice based on the systematization of several didactic resources supported in an autonomous organization by the student, with the tutoring of the contents

performed by the teacher (ALFARO, CLESAR, GIRAFFA, 2020). In this sense, for the reality of Brazil, the continuity of school practices through the ERE represented a challenge to the extent that 37 million school-age children (9 to 17 years old) in Brazil do not have internet access at home (CETIC, 2019a).

In a survey conducted with 182 high school teachers, Corrêa, Nunes and Dias-Trindade (2020) applied the DigCompEdu (Digital Competence Framework for Educators) questionnaire, a self-assessment instrument of digital competencies, and identified that these participants were at the median level called integrator, i.e., the one in which the teacher experiences digital technologies in different contexts and integrates them in their classes, the third level of proficiency, of a six-level scale that starts in the newcomer profile and goes up to the pioneer.

Oliveira, Silva, and Silva (2020) highlight three important aspects when analyzing the ERE scenario: access to the Internet, the quality of technological artifacts of students and teachers, and the domain and training for the use of these artifacts. Regarding the initial and continuing education of teachers, the insertion of technologies is something relatively recent, from the resolutions CNE/CP No. 1 of May 15, 2006 and CNE/CP No. 2 of July 1, 2015, which has repercussions on the ability of teachers to access and explore the technologies in order to integrate them into their teaching practice, through active methodologies, with innovative practices.

Dias-Trindade, Correia, and Henriques (2020) in a survey conducted with 98 Brazilian teachers, about their performance in remote teaching, identified, as the most used digital platforms, Microsoft Teams (67.4%) and Google Classroom (26.1%). Regarding the technical-pedagogical support, 62% of the teachers claimed to have received it from the educational institutions where they work. As for the training for the application of digital technologies, 69.6% of the teachers sought a course in order to feel more comfortable in their pedagogical practice. Regarding the content taught in remote teaching, 80.4% of the teachers said that their schools followed the school planning, even in an online mode, while 16.3% of the teachers claimed to have done only the reinforcement of learning.

According to Hino (2019), inserting Digital Information and Communication Technologies (DICTs) in education implies a paradigm shift for both teachers and students, teachers will need to review their practice, appropriate new methodologies and incorporate them considering also the reality of virtual teaching in order to make the student the subject of his learning, while students will need to develop a more active attitude towards knowledge.

Godoy, Falcoski, Incrocci, Versuti, Padovan-Neto (2021) identified that psychological distress and states of anxiety caused by remote teaching due to the pandemic influenced the ability of higher education students to coordinate social and work activities, thus interfering with their academic performance. For high school students of a public school in the state of Rio de Janeiro, having the cell phone as the main means of access to the remote class platform, the difficulties were access to the internet, since many did not have wi-fi connection; the lack of feedback from the teacher; the way the platform was organized; the difficulty of not having the teacher to answer their questions during the exercises; doing the exercises over the cell phone; accumulating assignments and sending the activities over the platform. Some cited the fact that they felt bad for spending many hours in front of the computer screen (TATAGIBA, TATAGIBA, 2021, p. 7).

When dealing with the learning of mathematics by 69 high school students, in a remote way, 42% of them answered that the remote classes were not enough for their learning and that the alternative to clarify doubts was the access to YouTube tutorials (71%), and the WhatsApp application was used by most of them to participate in the classes (66.7%). On the other hand, in this same study by Gonçalves and Cunha (2021), among the three teachers who participated, only one evaluated the students' learning level in the 2020 school year as bad, the others evaluated it as acceptable.

The COVID-19 pandemic engendered with remote teaching a new productivity flow, that is, the production of the teaching work started to be quantified by the numbers of pedagogical activities performed by the students on the platforms and of learning evaluations. This calculation did not include WhatsApp communications for student orientation, often individual, videos, audios, online call records, among other practices (SOUZA *et al.*, 2021).

Ramôa, Barbosa and Silveira (2020) identified losses in the routine of the subject, in the contact with the student, as well as lack of digital literacy, problems with the language of some applications, problems with internet connection and lack of adequate equipment for participation in synchronous classes, by students of the final years of elementary school, in the public network of the State of Rio de Janeiro. On the other hand, social networks and messaging applications emerged as a satisfactory alternative among teachers for their contact with students, requiring a flexible posture regarding the volume of tasks and the deadline for their completion by students.

In addition to these difficulties in the execution of remote teaching in the quarantine period, female teachers - 80% of the teaching staff in Brazil according to Carvalho (2018) - especially those who are mothers, were exposed to greater overload, accumulating work tasks with domestic care and the care of children who were also in remote teaching, i.e., the family with demands to solve by remote means having usually a small amount of equipment (notebook, smartphone, tablet) for many users in the same shift and not always a good internet connection (JASKIW, LOPES, 2020).

Thus, considering the brief scenario presented above, this study aimed to analyze the perception of Basic Education teachers about their practices and the ERE in a city in the Metropolitan Region of Belém/PA and as specific objectives to know the strategies and resources used by teachers in carrying out remote activities and verify the knowledge of teachers acquired with the new teaching reality. The research problem was: What are the perceptions of Basic Education teachers about their performance in emergency remote teaching in the 2020 school year?

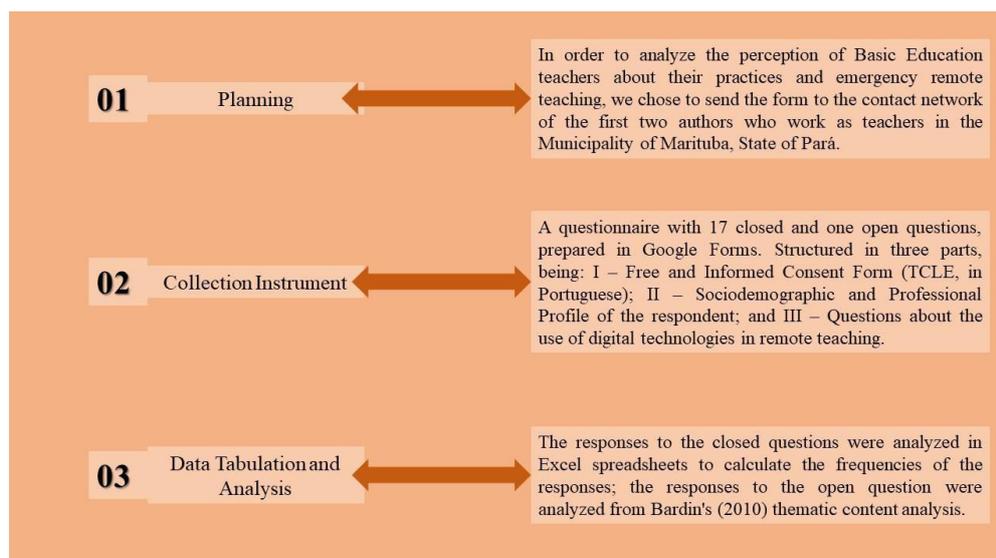
2. Methods

This is a field survey (MATTAR; RAMOS, 2021) with convenience sampling and descriptive purposes to obtain data about the practices adopted by teachers, as well as the DICTs used by them during the ERE in public schools of Basic Education in a municipality located in the metropolitan region of Belém, capital of the State of Pará, Brazilian Amazon.

A total of 46 teachers participated in this study, most of them women, fully licensed, aged between 30 and 49 years, with a career span of 1 to 10 years, working in the segments of Early Childhood Education, Elementary School and High School, in teaching units from the municipality of Marituba/PA, where remote activities were adopted from March 2020 to August 2021.

A questionnaire was applied, designed and made available through the Google Forms platform, structured in three parts: I - Term of Free and Informed Consent (TCLE, in Portuguese), II - Sociodemographic and Professional Profile of the respondent and III - Questions about the use of digital technologies in remote teaching, with a total of 18 questions (17 closed questions and one open question). The data collection was conducted online in the period from March 16 to March 31, 2021.

Basic statistics was used in the data analysis to calculate the frequencies of the responses to the closed-ended questions. The analysis of the answers to the open question was first performed by qualitative content analysis, in which the theme was the unit of record and the answers the unit of analysis, and then, within one of the themes, the frequency analysis (quantitative) was performed, in which the word was the unit of record and the phrase the unit of context (BARDIN, 2010).

Figure 1: The steps performed in this study.

Source: Authors (2021).

3. Results and Discussion

The 46 teachers who participated in this research are mostly female (78.2%) and are aged between 30 and 49 years (45.6%), the same gender and age predominance was also identified by Carvalho (2018) in the survey of the profile of Basic Education teachers. Table 1 shows the characterization data of the participants.

Only one teacher is not a full graduate, the others have a degree in Pedagogy or another degree, data similar to those described by Carvalho (2018), who highlights a downward trend in the presence of teachers with high school education, accompanied by an increase in the number of teachers with higher education. Another aspect highlighted in this study is the presence of teachers with high school degrees in Kindergarten and the early years of elementary school, which is higher than in other levels of Basic Education.

Table: Characterization of the Participants.

CATEGORIES	SUBCATEGORIES	Σ	%
Degree of Formation	Undergraduate	20	43,4
	Specialization	23	50
	Master's Degree	3	6,5
Education Area	Pedagogy	24	52,1
	Other Degree	21	45,6
	Technologist	1	2,1
Time working in Basic Education	1 to 5 years	18	39,1
	6 to 10 years	13	28,2
	11 to 15 years	7	15,2
	16 to 20 years	5	10,8
	More than 20 years	3	6,5

Segment where you teach	Only in Early Childhood Education	1	2,1
	In Early Childhood Education and Elementary School	23	50
	Elementary School only	18	39,1
	In Elementary/Junior High School	3	6,5
	Only in the Secondary School	1	2,1

Source: Authors (2021).

As for the segment in which they work, 50% of the teachers teach in Early Childhood Education and in the early years of elementary school. This data is consistent with the data from the Partial Report, in which 91% of teachers in Early Childhood Education and the early years of elementary school were working remotely in the 2020 school year (ALFABETIZAÇÃO EM REDE, 2020).

It was observed that the vast majority (67.3%) have been working in Basic Education from 1 to 10 years, so the quality of the insertion of technologies in their initial training is questionable, since the resolution CNE/CP No. 1 of May 15, 2006, the courses must include this topic in their curricula. This gap in initial training is evident in the answers about the knowledge of digital technologies and the pedagogical practices necessary for their usability. These data are shown in Table 2.

As for the mastery and use of digital technologies, 65.2% know and use them regularly; on the other hand, there are still 19.5% who recognize they have no skill in using them. These data are consistent with the data of Corrêa, Nunes and Dias-Trindade (2020) in their study with high school teachers, in which they self-assessed themselves with an average profile in relation to the use of DICTs, i.e., using them in their classes inconsistently, by trial and error, without a domain that allows them to select the technology according to the content to be taught.

Table 2: Use of Digital Technologies

CATEGORIES	SUBCATEGORIES	Σ	%
Domain about Digital Technologies and their use	I know and use it regularly	30	65,2
	I know about it, but I use it occasionally	5	10,8
	I know about it, but have no skill in using it	9	19,5
	I don't know, but I am interested in learning	2	4,3
Self-perception regarding the use of Digital Technologies	I use it with ease and want to expand my knowledge	29	63
	I recognize that it is necessary to learn to use, but I do not use yet	5	10,8
	I have to learn in order to study and/or work	12	26
This is the first time you teach remotely	Yes	38	82,6
	No	8	17,3
Do you have internet to work with the ERE*?	Yes, I use wi-fi at home	41	89,1
	Yes, I use cell phone data	5	10,8

Evaluation of the use of digital technologies in the ERE*	Excellent	6	13
	Very Good	11	23,9
	Good	13	28,2
	Fair	11	23,9
	Weak	5	10,8
Evaluation of student participation during remote classes	Participative	10	21,7
	Resistant	28	60,8
	Apathetic	4	8,6
	Disbelievers/skeptics	2	4,3
	Indifferent	2	4,3

*ERE: Emergency Remote Education.

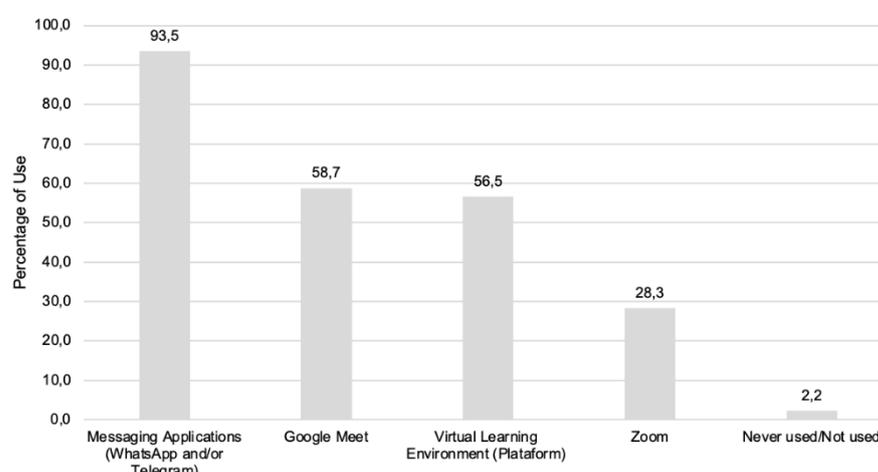
Source: Authors (2021).

The majority, 63% evaluated that they use them calmly and are interested in expanding their knowledge, while 26% used the DTICs in their teaching practice because they were forced to because of their performance in the ERE, since 82.6% worked in remote teaching for the first time. The mastery of resources and technologies proved to be a relevant aspect in the ERE condition once all the activities began to occur in a virtual environment, abruptly (OLIVEIRA, SILVA, SILVA, 2020).

When evaluating the use of digital technologies in the ERE, teachers' opinions focused on good (28.2%), very good, and regular (each with 23.9%). And although 21.7% of the students were perceived by the teachers as participatory in the classes, 60.8% were resistant to this practice. One can infer several factors as responsible for this "resistance" of students, besides the social and economic issues that mark the reality of public school students, their lack of digital literacy, internet connection problems, and lack of equipment suitable for this format, difficulties with the language of the applications (RAMÔA, BARBOSA e SILVEIRA, 2020), the discomfort of staying so long in front of the computer (TATAGIBA, TATAGIBA, 2021), and also the psychological suffering and anxiety that marked the pandemic context of COVID-19 (GODOY, FALCOSKI, INCROCCI, VERSUTI, PADOVAM-NETO, 2021).

Regarding the tools that the participants used in the ERE and those that were mentioned as easiest to use, the data specified in Figures 2 and 3, respectively, were collected.

Figure 2: Tools used in remote teaching.

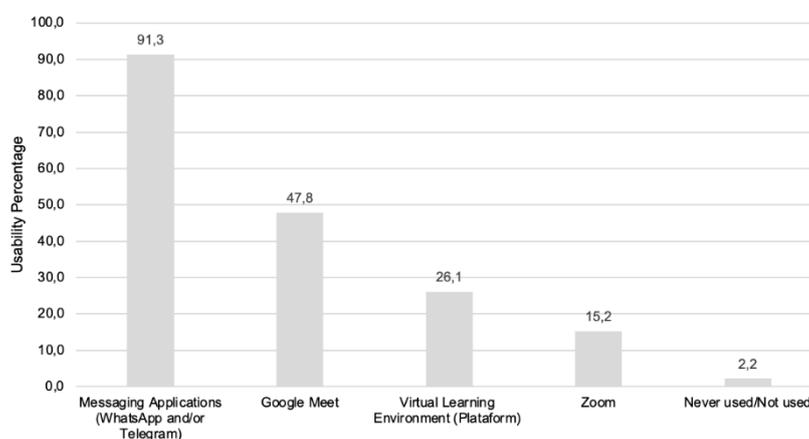


Source: Authors (2021).

Considering CETIC data, where in Brazil 93% of children aged 9 to 17 have access to the internet by mobile phone (CETIC, 2019b), it can be seen that the most frequent tool in fact were the messaging applications (93.5%) (GONÇALVES, CUNHA, 2021; SOUZA *et al.*, 2021; TATAGIBA, TATAGIBA, 2021), since they are the most accessible for use on mobile devices, followed by Google Meeting (58.7%) and digital platforms (56.5%). These data corroborate data from Dias-Trindade, Correia, and Henriques (2020), in which the Google Classroom platform was the second most used in remote teaching and data from Alfaro, Clesar, and Giraffa (2020), who highlighted the use of Google for Education, WhatsApp, and printed materials for students who did not have internet access.

Confirming the data about the most used tools in the ERE in Table 1, the messaging applications were identified by the participants as easier to handle with 91.3%, followed by the Google Meeting platform (47.8%), since most 82.6% of the participants, before the pandemic, had no experience with virtual teaching. It is observed that teachers and students, when migrating from face-to-face teaching to ERE, relied on applications that already had some practice, evidencing one of the differences between this reality and EaD, that is, the lack of teacher training regarding resources and pedagogical practices for virtual teaching (BEHAR, 2020; HODGES *et al.*, 2020; JOYE, MOREIRA, ROCHA, 2020).

Figure 3: Tools considered easier to handle



Source: Authors (2021).

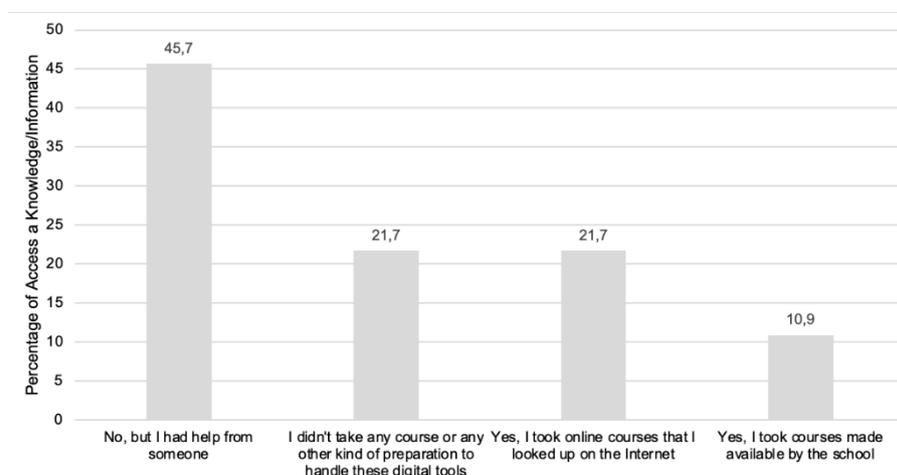
With regard to access to content/information through courses aimed at the use of digital tools for ERE, the data specified in Figure 4 follows.

Three movements of teachers can be perceived in relation to the mastery and application of technologies in the ERE, those who did not have specific training on the use of technologies, relying only on the help of a close person (45.7%), and the groups who sought and took online courses and the one who did not take any course (both with 21.7%). When we add the results from the movement of the teacher in seeking guidance and knowledge, either from an acquaintance or through a formal course, we have a percentage of 67.4%, which is consistent with the data of Dias-Trindade, Correia and Henriques (2020), in which 69.6% of teachers had the action of seeking information/taking a course in order to feel more comfortable in their teaching practice.

However, still in this study, the authors identified that 62% of the teachers claimed to have received technical and pedagogical support from the educational institutions where they work (DIAS-TRINDADE; CORREIA; HENRIQUES, 2020), which differs from the data obtained here, since only 10.9% had technical guidance from the school where they work. It can be inferred that there was no articulation between the management of these schools and the Municipal Secretariat of Education in order to provide teachers with adequate training for the implementation of the ERE. This lack of training was also identified by Hino (2019) in his study with higher education teachers.

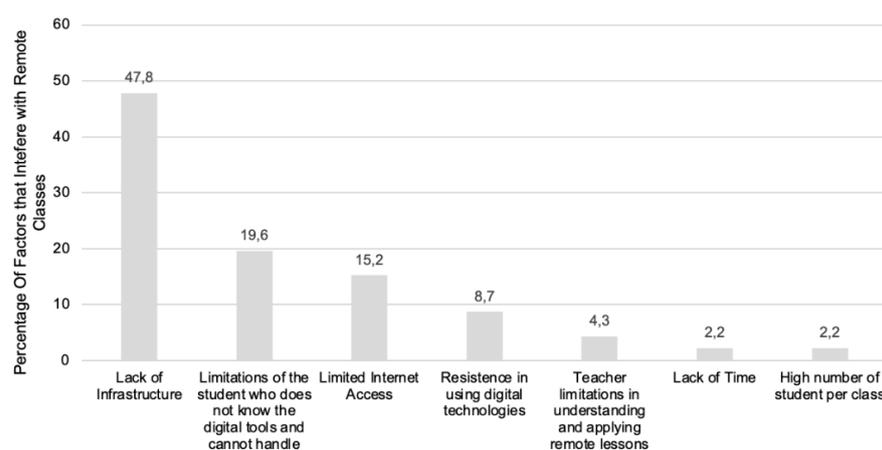
In this context, learning and innovation have become key words, but some difficulties need to be overcome in order to achieve better results. Regarding the teachers' difficulties in applying remote classes, the data shown in Figure 5 were collected.

Figure 4: Access to knowledge/information for using digital tools



Source: Authors (2021).

Figure 5: Factors that interfere with remote classes



Source: Authors (2021).

The lack of infrastructure was the biggest factor identified by teachers with 47.8%, followed by limitations of the student in handling digital tools (19.6%) and limited internet access (15.2%). It can be seen how schools, professionals and students of Basic Education were not prepared for the performance of virtual mode, being a difficulty shared with other teachers in Brazil (GONÇALVES, CUNHA, 2021; RAMÔA, BARBOSA and SILVEIRA, 2020; TATAGIBA, TATAGIBA, 2021) and Portugal (DIAS-TRINDADE, CORREIA, HENRIQUES, 2020).

The implementation of the ERE for students to continue their studies, culminated in an overload of activities for teachers since the monitoring of these was not restricted to the times of classes or platforms or virtual learning environments, but occurred in the applications that students and teachers had more ability to use and the time that students could perform the tasks.

In the analysis of the one open-ended question about what they learned from this remote teaching experience, at the beginning of the content, qualitative analysis three thematic categories were identified: "Contents and skills learned", "Considerations about ERE", and "Considerations about learning". In this last category, the frequency of words linked to their learning and the object learned was surveyed.

3.1. Contents and skills learned

Some participants directly identified the contents and skills learned in this experience. The contents identified were: applications, lives, basic and advanced computer concepts, methodologies, internet, among others. The skills were specific to the use and application of technologies in remote teaching, such as: virtual communication, searching for new tools. They also had personal skills such as patience, persistence, and the soft skills of problem solving and effective communication with students.

In P10's words "I was able to satisfactorily extend my computer knowledge without a course. Just snooping around, asking questions, exploring everyone who has knowledge and is close to me" shows the learning in practice as highlighted by Dias-Trindade, Correia, and Henriques (2020) and the intensification of collaborative practices (OLIVEIRA, SILVA, SILVA, 2020), to the extent that 45.7% of them, although they had not taken a course, claimed to have someone's help in handling technologies (according to Figure 4).

3.2. Considerations about Emergency Remote Education (ERE)

There were also reflections on the implementation of emergency remote education, as in the speech of P19, "There is still a huge disparity and need for students to adapt to remote education. Although the use of technology is indispensable, it only has more effect if it is aligned with classroom teaching", highlighting the need for a hybrid methodology in order to guarantee the children's learning rights. Hybrid teaching would be a way to guarantee the socialization, the body, the movement and the look, that is, the contact with the student lost with the implementation of the ERE due to the COVID-19 pandemic (JASKIW, LOPES, 2020; RAMÔA, BARBOSA, SILVEIRA, 2020; SOUZA *et al.*, 2021).

Another aspect highlighted was teacher isolation and lack of support (SOUZA *et al.*, 2021), "Increasingly, the responsibility for creating ways to share knowledge falls on the teacher, with many demands from everyone, but with none or the least assistance from the other segments of the school community", according to P23. This need for the teacher to act in urgency, without time to stop and reflect, and often without adequate training or technological and didactic knowledge (CORRÊA, NUNES, DIAS-TRINDADE, 2020; OLIVEIRA, SILVA, SILVA, 2020) contributed to the teachers' feeling of isolation.

There were also those who mentioned the circumstances of the students to carry out remote teaching, as in the speech of P27: "I identified that there are many students who cannot follow the activities due to socio-economic problems and many parents do not even own a cell phone, and many parents have difficulties to give guidance to their children because many are not literate". The lack of infrastructure and digital literacy of students and guardians was also highlighted by other studies (CETIC, 2019a; CETIC, 2019b; DIAS-TRINDADE, CORREIA, HENRIQUES, 2020; OLIVEIRA, SILVA, SILVA, 2020; RAMÔA, BARBOSA, SILVEIRA, 2020).

One can see in the reports the formative character of this knowledge acquired through the experience of the ERE, allowing the teacher, together with the professional conditions to which he is subjected, to evaluate them, as well as his own training and practice.

3.3. Considerations about learning

This experience led the teachers who participated in this research to reflect not only on the execution of the ERE, but also on the content and skills learned and the need for constant learning, recognizing that it is possible to teach and learn with quality using DICTs, as one of them (P26) said: "I learned that teaching doesn't need to be only in the school environment, all environments are favorable when you want to learn", detaching learning from the classroom context, expanding it to other spaces.

Besides the thematic analysis, the frequency of the words linked to their learning and to the object apprehended was surveyed, which resulted in a word cloud (Figure 6), with the words technologies, new, form and tools as the most prominent, and other background words such as knowledge, students, professor, digital, apprenticeship, among others.

Figure 6: Word cloud formed with the responses of considerations about learning.



Source: Authors (2021).

Needing to learn as the driving force of their professional development, these teachers sought guidance on the applications, on ways to adapt the technologies to their practices and to the social context in which they are inserted along with their students, as P16 said “I learned that limitations do not exist, we are fully capable of reinventing ourselves, but we need to take the first step”, placing themselves as permanent learners, something that is optimized by the use of DICTs (HINO, 2019).

One year after the beginning of the ERE, these teachers consider themselves to have mastered the TDIC’s and feel prepared to use them, with access to the internet at home, even though this preparation has been achieved not through formal courses, but mainly through immersion in the ERE, in the use of tools often by trial and error and also through the help of close people.

4. Final considerations

This study sought to analyze the perception of Basic Education teachers about their practices and emergency remote teaching. The results showed that the teachers evaluated as good the insertion of the DTICs in their teaching practices, despite not having experience with teaching in the virtual modality. They identified messaging applications (WhatsApp and Telegram) as the tools they used the most in the classes, being considered the easiest. This concentration of answers in the messaging tools and Google Meet Platform (second place in the most used tools) can be attributed to the fact that these messaging applications were the ones that teachers already had greater ability to use for non-teaching purposes.

In this way, the group of teachers participating in this study demonstrated an attitude of seeking information and knowledge, based on the knowledge of experience, since the abrupt change from face-to-face to virtual and the pandemic context required new practices. Along the way, they identified students who were resistant to this new way of teaching and learning, as well as a lack of infrastructure and limitations in the use of DICTs.

One of the limitations of this study was the fact that it was not possible to homogenize the sample in order to be closer to the population of teachers in this municipality, since the form was forwarded from the authors’ network of contacts, thus reducing the possibilities of reaching the population. Another aspect was that the instrument was applied online, which required the participant to have access to a computer or other device with network connection, or even experience with this type of research and type of instrument, which contributed to a reduced number of participants.

Therefore, as other possibilities for study, it is suggested to expand the information collected by incorporating to the instrument other data such as the teacher's workload, the school's technical structure, accessibility to students with disabilities, marital status and number of children, and the teacher's disability status. Also, combine this methodology with other forms of collection, such as online interviews or online conversation circles in order to include students and other education professionals, among others.

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