

## Teachers' Perception of Emergency Remote Learning in Portugal During Covid-19 Pandemic

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### ABSTRACT

The COVID-19 pandemic has highly impacted our society, particularly educational professionals, on their daily routines and changing the way they work. COVID-19 spread quickly, and we had to take urgent action on closing schools so teachers would continue to teach their students and put stringent measures such as national lockdowns and social distancing initiatives. The present study aims to understand teachers' perceptions regarding the operationalization of Emergency Remote Learning in Portuguese schools. The study also seeks to measure differences in satisfaction level, attitudes, and challenges across teaching methodology adopted by teachers. It will be used as a quantitative study, using a survey as a technical procedure for data collection to meet the proposed objectives. Data collection lasted two months, implemented through the availability of the study online on social networks, for teachers to respond voluntarily. Findings show that the COVID-19 pandemic and social distancing requirement has presented undue challenges for all education stakeholders, especially teachers. The teachers felt exhausted, but they recognized that the Technology has made a significant contribution and showed a willingness to learn more to integrate technologies into their practice and recognize the importance of this being done effectively.

### INTRODUCTION

On January 30, 2020, the World Health Organization identified the SARS-CoV-2 epidemic as an international public health emergency. On March 11, 2020, characterized the virus as a pandemic due to the high number of affected countries. Due to the threat of COVID-19, educational institutions had to make decisions regarding the adoption of a form of teaching that would allow, at the same time, to keep students, teachers, and staff safe from a new virus, but also to continue with the one that it is the meaning of the school, the pedagogical relationship of Teaching/Learning. The Pandemic led to a rapid transition from the usual face-to-face teaching modality to a fully online modality called 'emergency remote teaching'. This abrupt change generated fear of the unknown, created anxiety in school communities, led teachers to quickly reconfigure their pedagogical projects and strategies (Green, Burrow & Carvalho, 2020). According to Lee and Campbell (2020), today's education needs to create a new teaching and learning environment.

This article presents a study in which we intend to explain teachers' perceptions regarding the operationalization of Emergency Remote Learning in Portuguese schools. Data collection was based on the application of a survey with 18 closed and 6 open questions. In the exploratory analysis phase of the construction process of this survey, we collected data on the perception of teachers regarding emergency remote teaching. Then, based on information collected from teachers and on existing literature on the area, we built a survey available online to be applied to teachers at different levels of education. It should be noted that experts in the field of education were consulted, and pilot tests were carried out to validate the data collection instrument and, based on these results, the survey was subsequently reformulated to the final version. We made the survey available on February 21, 2021, through

digital channels and ended responses on April 21, 2021. Teachers from pre-school to higher education voluntarily participated in our survey, in a total of 1083 respondents from different parts of Portugal and mainly in the public education system. In general, we realize that many teachers do not use Virtual Learning Environments and those who do, refer to opting for Google Classroom or Microsoft Teams as LMS (Learning Management System) platforms. The LMS platforms is a virtual environment that makes it possible to manage online learning. It was possible to identify the use of different videoconference communication platforms such as Skype, Google Meet, Zoom, Webex, among others, to guarantee synchronous sessions, although without knowledge of synchronous and asynchronous concepts. The results obtained show that teachers show fatigue in remote classes, they feel tired looking at the screen, but at the same time, this type of teaching made them feel secure regarding the transmission of the virus. Based on the results obtained from the teachers' answers, we end this article presenting some suggestions for future investigations.

The article addresses the issue of remote learning in the COVID-19 Pandemic, then presents the methodology adopted in the study and its description. Subsequently, the construction collection process is explained and, finally, the results and conclusions regarding the information collected through the described survey. Finally, it ends with some proposals for future work.

### LITERATURE REVIEW

Distance Learning is a modality of education through which technology is necessary to involve students in learning (Moore & Kearsely, 2011). Online teaching assumes that students and teachers do not need to be in the same physical environment for the learning process. Students and teachers are connected through an online learning system called the e-learning platform in online teaching. As in online education, there is no physical classroom where guidance is provided before an activity. So, it is essential to prepare a plan, for example, a weekly guide or a monthly guide where students can consult all the information and guidance necessary to follow the online classes (Monteiro, Moreira & Lencastre, 2015).

E-learning is a form of distance learning, but distance learning is not e-learning (Rosenberg, 2006). Both e-learning and distance learning involves students working on computers or other mobile devices. However, in e-learning, students can stay together in the same space while their classes and assessments occur. In distance learning, lessons and assessments can take place online with students at home. Due to this, the interaction between students and teachers will be different in e-learning and distance learning because e-learning involves personal interaction, and distance learning does not include meeting in person. Therefore, E-learning provides a learning opportunity for physically distant people (Moore & Kearsely, 2011). In e-learning, the student becomes a self-directed learner and learns simultaneously and asynchronously at any time (Maatuk, Elberkawi, Aljawarneh, Rashaideh & Alharbi, 2021). Thus, online learning improves student engagement and performance (Khlaif, Salha & Kouraichi, 2021). More than transmitting knowledge, the teacher must now guide the student's learning process to develop their abilities, namely learning to learn, self-learning, and autonomy (Moreira, Henriques & Barros, 2020).

The evolution of technologies and forms of communication has caused changes in society, boosting the birth of new pedagogical models, educational communication processes, and new teaching-learning processes (Garrison & Anderson, 2005; Moreira, Henriques & Barros, 2020). With the COVID-19 pandemic, schools were closed, and distance learning for all subjects or courses became a daily practice. This change forced teachers and students to a new professional reality. In addition to a professional challenge for teachers, this adaptation was also an organizational challenge in conducting the entire teaching process for schools (Cicha, Rizun, Rutecka & Strzelecki, 2021). The COVID-19 pandemic led to rapid and emergency change, almost obligatorily. Educational institutions and teachers were forced to adopt emergency remote learning (ERL) practices (Moreira, Henriques & Barros, 2020; Green, Burrow & Carvalho, 2020). Remote learning needs adaptability and good planning (Marek, Chew & Wu, 2021). The transition from a face-to-face teaching regime to a distance teaching/learning process, in an emergency such as the COVID-19 pandemic, generated constraints in various sectors of society (Durão & Raposo, 2020). To continue teaching, teachers had to quickly reconfigure their plans and pedagogical strategies according to the new learning scenario (Green, Burrow & Carvalho, 2020). The suspension of classroom teaching activities led students and teachers to the reality of distance learning, transferring and transposing methodologies and pedagogical practices typical of physical learning territories to what the literature has called emergency remote learning (Moreira, Henriques & Barros, 2020). In a research study by Onyefulu (2021) aimed to investigate teachers' perceptions of leadership effectiveness in emergency remote learning during the coronavirus pandemic. This author realized that most of the teachers were of the view that their leaders provided them information about the e-learning process and an opportunity to promote innovation dynamics at school. Also, Khlaif, Salha, and Kouraichi (2021), in their study where they sought to explore the factors that influence student engagement in online learning during emergency remote learning, found that emergency remote learning during pandemic COVID-19 negatively impacted student involvement in learning due to the new challenges they encountered

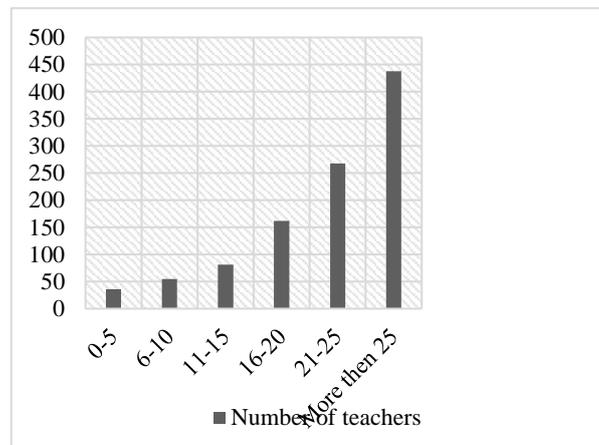
during the learning process, such as infrastructure, cultural, digital inequality, and digital privacy.

## METHOD

This study was strongly anchored on the perception of Portuguese teachers from different disciplinary areas about how emergency remote learning went during the COVID-19 pandemic. An exploratory study was employed, including data collection, statistical and qualitative analysis. Data collection is based on the survey built by us and validity to the Portuguese population of teachers. Teachers were informed that their participation was voluntary, anonymous, and confidential, with no relationship with their school; thus, their opinions are protected by anonymity.

## PARTICIPANTS

The targeted professionals work in the public and private sectors from Portugal. A total of 1041 teachers at a Portuguese school participated in this study. Teachers from different school years, and from many places in Portugal, took part in this study. The respondents are experienced teachers: 42% (438 teachers) have more than 25 years of service time, 26% (268 teachers) have twenty-one and twenty-five years of service, 16% (162 teachers) have sixteen and twenty years of service, 8% (81 teachers) have between eleven and 15 years of service, 8% (91 teachers) have less than ten years of service time as a teacher (Chart 1).



**Chart 1:** years of teaching service of teachers

## DATA COLLECTION AND ANALYSIS

Data collection is based on the survey we built and its validity to the Portuguese population. The survey was implemented using Google forms and convenience sampling. The survey was made available and posted on social networks from March to May 2021. Respondents voluntarily participated by answering the survey.

Data analysis is focused on the understanding of remote learning during COVID-19 from the perspective of teachers. The investigators did not carry out any intervention in public, and the studied variables had only one measure in each of the participants. This work follows a quantitative study paradigm, with descriptive exploratory character to understand teachers' perception regarding the operationalization of emergency remote learning in Portuguese schools. We opted for an experimental study because the addressed topic is recent, and the information found can help characterize the context of emergency remote learning during the COVID-19 pandemic. The surveys included 22 questions and 18 closed-response items using a Likert-type scale of degree according to 5 points (from 1 = strongly disagree to 5 = strongly agree), allowing teachers to express how much they agreed or disagreed with the statements. It also has four open-response answers to get a more detailed view of the teachers' perception.

Three Education specialists validated the first version of the survey. Subsequently, the changes suggested by the experts were applied, and a pilot test was carried out with five teachers as the target audience of the survey. With the information collected on the pilot test, we reformulated the survey before publishing it on social networks.

A total of 1041 teachers answered the survey. The data was exported in Excel and analysed with the statistical software IBM® SPSS version 20 through descriptive statistical techniques such as frequency distributions, graphics, central tendency measures, and dispersion measures. We designated the information of each teacher in the surveys  $T_i$  ( $i = 1 \dots 1041$ ).

## FINDINGS

Findings show great diversity regarding what LMS platform teachers used, most in Remote Learning 2.0 classes.

Most teachers reported using Google Classroom alone or with other platforms such as Classdojo, BlackBoard, Story Jumper, Kahoot, Padlet, Quizizz, YouTube, Khan Academy, Canva, Voki, Whatsapp, Edpuzzle, Moodle, Wakelet, Pixton, and the Mentimeter. A smaller proportion of teachers claimed to use Microsoft Teams alone or with other platforms. Most of the surveyed teachers felt ‘emotionally exhausted’, ‘exhausted at the end of a working day’, ‘tired out’, but continued to feel like working. The perception of their professional performance divided the inquired teachers, with a significant part recognizing that they felt fulfilled and another part not. The survey found that one hindrance for teachers was leaders' lack of incentive and the energy to do something significant in their online classes. However, it should note that around 78% of respondents report feeling relaxed during emergency remote learning because they have been able to rest more. Also indicated that by using emergency remote learning, they felt safe from getting the virus. Furthermore, they did not regularly commute to their schools to teach allowed them to sleep better and feel more relaxed during classes. In [Table 1], we present the perception about how they felt about their professional activity, in the table \*f corresponds to the absolute frequency.

**Table 1:** Teachers' perception about how they felt about their professional activity.

Question	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree	
	f*	%	f*	%	f*	%	f*	%	f*	%
Emotionally exhausted	88	8,5	190	18,3	183	17,6	343	33,0	236	22,7
Exhausted at the end of a working day	49	4,7	120	11,5	130	12,5	384	36,9	357	34,3
Tired out	61	5,9	97	9,3	99	9,5	442	42,5	341	32,8
Not willing to work	280	26,9	413	39,7	156	15,0	132	12,7	59	5,7
Not professionally performed	200	19,2	320	30,8	182	17,5	204	19,6	134	12,9
Lacking the incentive to do something significant	200	19,6	326	31,3	157	15,1	253	24,3	104	10,0
Lacking the energy to do something significant	169	16,3	332	31,9	145	13,9	296	28,5	98	9,4
I relaxed because I am not exposed to the risk of getting Covid-19 infection	214	20,6	236	22,7	243	23,4	243	23,4	104	10,0
Relaxed because I have been able to rest more	481	46,3	326	31,3	131	12,6	78	7,5	24	2,3
More confident because I have my family present	180	17,3	243	23,4	298	28,7	226	21,7	93	8,9

During emergency remote learning, teachers had to use video conferencing platforms to keep in contact with students. Furthermore, teachers are more exposed because they also have more eyes on their class when they invade students' homes. Generally, teachers do not felt uncomfortable in videoconferences, but they felt tired when looking at the computer screen. In general, teachers did not have difficulty controlling the class, nor did they found it difficult to understand students. In addition, most teachers do not felt inhibited by being observed by people other than students; they did not felt embarrassed in front of the camera or had difficulty connecting with technical components. In [Table 2], we present teachers' perceptions of videoconferencing sessions, in the table \*f corresponds to the absolute frequency.

**Table 2:** Teachers' perception of videoconferencing sessions.

Question	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree	
	f*	%	f*	%	f*	%	f*	%	f*	%
Uncomfortable	282	27,1	395	38,0	171	16,4	146	14,0	46	4,4
Tired of looking at the screen	93	8,9	151	14,5	98	9,4	469	45,1	229	22,0
Difficulty controlling the class	370	35,6	442	42,5	128	12,3	79	7,6	21	2,0
Difficulty understanding students	250	24,0	442	42,5	152	14,6	179	17,2	17	1,6
Inhibited by being observed by others besides the students	313	30,1	396	38,1	144	13,8	135	13,0	52	5,0
Embarrassed before the camera	403	38,8	414	39,8	135	13,0	69	6,6	19	1,8

Difficulty connecting with technical components	296	28,5	417	40,1	161	15,5	135	13,0	31	3,0
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Regarding the feeling of security in a videoconference session, teachers' responses indicate that respondents were a little more optimistic than neutral about how secure they felt about working from home regarding the transferability of COVID-19 (M = 3,6). To understand the relationship of teachers with emergency remote learning, we created seven questions. With the first of the questions being the effectiveness of the classes, in emergency remote learning, the average teachers' answer (M = 3,28) had a standard deviation of 0,78. Regarding the second question, the emotional relationship established with the students, in emergency remote learning, the teachers' opinions also seem to be divided (M= 3,62), with a standard deviation of 0,92. Teachers recognize that the relationship they can establish with students is crucial to teaching with quality. In this sense, teachers fear that the distance between teacher and student caused by emergency remote teaching could bring serious problems related to health and motivation to learn. However, it should note that some teachers managed to establish an emotional relationship with the students, others found it a challenge. With the third question, we seek to understand how teachers would classify the operationalization of content with students achieved in emergency remote learning. The average teachers' answer was 3,2 (M=3,2) with a standard deviation of 0,85. In the fourth question, about using technological resources in emergency remote learning, the average teachers' answer was 3,7 (M=3,7) with a standard deviation of 0,77. In the fifth question, about synchronous class time management in emergency remote learning, the average teachers' answer was 3,55 (M=3,55) with a standard deviation of 0,83. A significant part of the teachers felt difficulty managing time. In the sixth question, about student emergency remote learning, the average teachers' answer was 3,0 with a standard deviation of 0,78. Finally, the seventh question, about asynchronous class time management in emergency remote learning, the average teachers' answer of 3,4 (M=3,4) with a standard deviation of 0,94, divided the teachers' opinions. The changes caused by the abrupt transition from a face-to-face teaching model to an emergency remote learning model caused difficulties for teachers. Regarding weaknesses identified in emergency remote learning, teachers reported feeling more tired (47%), the Internet connection failures (42,7%), the impotence to solve students' inequality problems (41,4%), the privacy change (29,5%), the technical equipment failures (30,9%), and the digital literacy of students. Note that the disorientation and lack of organization were not so much pointed out as limitations in emergency remote learning.

In [Table 3], we present teachers' perception of weaknesses teachers identified in emergency remote learning, in the table \*f corresponds to the absolute frequency.

**Table 3:** Weaknesses teachers identified in emergency remote learning.

Question	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree	
	f*	%	f*	%	f*	%	f*	%	f*	%
Loneliness	176	16,9	245	23,6	179	17,2	326	31,3	95	9,1
Tired	53	5,1	110	10,6	91	8,8	489	47,0	289	27,8
Internet connection failures	55	5,3	145	13,9	134	12,9	444	42,7	249	23,9
Disorientation	271	26,1	409	39,3	221	21,2	102	9,8	25	2,4
Lack of organization	296	28,5	479	46,1	151	14,5	80	7,7	21	2,0
Lack of clear superior guidelines	142	13,7	309	29,7	201	19,3	261	25,1	121	11,6
Impotence to solve students' inequality problems	44	4,2	97	9,3	115	11,1	431	41,4	348	33,5
Lack of equipment/tools to work	142	13,7	243	23,4	183	17,6	300	28,8	160	15,4
Difficulties in communicating with students	141	13,6	343	33,0	220	21,2	273	26,3	51	4,9
Power failures	256	24,6	309	29,7	170	16,3	227	21,8	62	6,0
Difficulty in capturing students' attention	126	12,1	309	29,7	260	25,0	279	26,8	45	4,3
Lack of collaboration on the part of guardians	153	14,7	338	32,5	284	27,3	208	20,0	46	4,4
Lack of motivation to work	255	24,5	355	34,1	202	19,4	162	15,6	50	4,8
Lack of digital skills	292	28,1	379	36,4	189	18,2	137	13,2	29	2,8
Changes in usual working hours	231	22,2	312	30,0	198	19,0	193	18,6	89	8,6
Lack of space to work	288	27,7	356	34,2	154	14,8	162	15,6	67	6,4
Privacy change	135	13,0	217	20,9	208	20,0	307	29,5	163	15,6
Technical equipment failures	121	11,6	253	24,3	207	19,9	321	30,9	125	12,0
Digital Literacy of Students	73	7,0	170	16,3	224	21,5	405	38,9	155	14,9

The need for mass adoption of emergency remote learning due to the COVID-19 pandemic, regardless of education, age, or institution, has led to students, parents, teachers, and the entire society starting to monitor benefits and the challenges of this teaching model. According to most teachers, remote emergency education has several advantages for both teachers and students: student participation, student interaction, education, resilience, variety, creativity, domain of the platforms. It also brought challenges to teachers such as the ability to adapt strategies to this type of teaching, or to adapt learning activities, or the creation of dynamic classes with different activities. Regarding the competencies developed in their students, most teachers considered that remote emergency education promoted students' autonomy in carrying out tasks and helped seeking proximity and students' independence in carrying out assignments. Also, teachers believe that remote emergency education promotes the knowledge of new digital tools, easier to motivate students, to get empathy with students, to give feedback to students, and to enable regulatory input for the student. Regarding teacher attitudes, teachers identified the student participation (46,7%), the student interaction (44,6%), the resilience (58%), the variety (53,7%), the creativity (55,2), the ability to get everyone's presence (42,5%) and the ability to adapt strategies to this type of teaching (58,3%), as potentialities in emergency remote learning. Teachers also identified as the main potentiality of this teaching mode, the creation of dynamic classes with different activities (53%), the domain of the platform that teacher's use to support learning (53,6), the remote teaching pre-preparation (44,3%), the seeking proximity to students (46,8%), the promoting students' autonomy in carrying out tasks (55,3%), their efficiency (42,6) and live experience (47,7%). They recognize that the use of apps teacher facilitator-student interaction (47,3%), the challenge to leave the comfort zone (50,3), the knowledge of new digital tools (53,7%), the motivation of students (44,9 %), are also potentialities in emergency remote learning. In addition, for these professors, the empathy with students (43,8%), the availability to give feedback to students (44,3%) and the possibility of providing regulatory input for the student (45,2%) are also seen as potentialities of this emergency remote learning. A significant part of them noted that student participation (19,4%) and student interaction (22,7%) were enhanced by emergency remote learning. In [Table 4], we present potentialities identified by teachers in remote emergency education, in the table \*f corresponds to the absolute frequency.

**Table 4:** Potentialities identified by teachers in emergency remote learning.

Question	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree	
	f*	%	f*	%	f*	%	f*	%	f*	%
Student participation	42	4,0	202	19,4	221	21,3	486	46,7	82	7,9
Student interaction	40	3,8	236	22,7	210	20,2	464	44,6	77	7,4
Formation	28	2,7	108	10,4	245	23,6	515	49,5	125	12,0
Resilience	15	1,4	56	5,4	153	14,7	603	58,0	201	19,3
Variety	19	1,8	77	7,4	237	22,8	558	53,7	138	13,3
Creativity	19	1,8	80	7,7	186	17,9	574	55,2	173	16,6
Get everyone's presence	45	4,3	175	16,8	223	21,4	442	42,5	141	13,6
Ability to adapt strategies to this type of teaching	19	1,8	81	7,8	165	15,9	606	58,3	162	15,6
Ability to adapt learning activities	19	1,8	81	7,8	168	16,2	606	58,3	156	15,0
Create dynamic classes with different activities	18	1,7	88	8,5	206	19,8	551	53,0	168	16,2
Domain of the platform I use to support learning	21	2,0	88	8,5	151	14,5	557	53,6	212	20,4
Remote teaching pre-preparation	56	5,4	132	12,7	217	20,9	461	44,3	161	15,5
Daily support from guardians	83	8,0	226	21,7	366	35,2	295	28,4	61	5,9
Seeking proximity to students	36	3,5	130	12,5	239	23,0	487	46,8	137	13,2
Promoting students' autonomy in carrying out tasks	23	2,2	75	7,2	146	14,0	575	55,3	214	20,6
Efficiency	43	4,1	151	14,5	309	29,7	443	42,6	85	8,2
Optimism	43	4,1	174	16,7	286	27,5	407	39,1	119	11,4
Lived experience	27	2,6	100	9,6	260	25,0	496	47,7	142	13,7
Use of Apps that facilitate teacher-student interaction	30	2,9	100	9,6	221	21,3	492	47,3	182	17,5
Challenged to leave the comfort zone	22	2,1	66	6,3	180	17,3	523	50,3	238	22,9
Greater monitoring of students	106	10,2	268	25,8	291	28,0	285	27,4	73	7,0
Knowledge of new digital tools	20	1,9	52	5,0	137	13,2	558	53,7	264	25,4
Motivate students	33	3,2	132	12,7	276	26,5	467	44,9	115	11,1
Empathy with students	34	3,3	122	11,7	267	25,7	455	43,8	147	14,1

Availability to give feedback to students	38	3,7	120	11,5	203	19,5	461	44,3	201	19,3
Regulatory feedback for the student	33	3,2	119	11,4	222	21,3	470	45,2	181	17,4

In emergency remote learning, students are physically distant, so it is essential to think and design teaching strategies that involve them in challenges and problem-solving. In addition, according to some interviewed teachers, it is necessary for greater monitoring of students, involving students more in active participation, and promoting autonomy. According to these teachers, students must have daily support from their tutors to seek proximity, motivate students, and challenge them to leave their comfort zone to promote a pedagogy that favours communication, the interaction between students and production to improve learning.

At the end of the survey, teachers had four open-response questions to get a more detailed answer of the teachers' perception about emergency remote learning. We sought to understand the teacher's perception regarding the positive and negative aspects of emergency remote learning with these questions.

Emergency remote learning had repercussions on work and on interaction between educational actors, affecting the way teachers teach and the way students learn. For the surveyed teachers, the emergency remote learning was "a challenging experience for teachers, students, and parents" [T12], and "it was the use of new technologies" [T214] that "increased digital literacy for students and teachers" [T216]. Nevertheless, they recognize that emergency remote learning "has allowed us to see education from a different perspective, challenging us to reflect on practices that have been established and outdated" (T187).

Teachers and students started distance classes with different skills in the use of technology and with unequal material conditions of access, which led the teachers to arrange different strategies. These teachers admit that they "have learned a lot but work even harder" [T70] in this mode of teaching. Nevertheless, it is teaching "more focused on pedagogical differentiation, on the student, on learning" [T4] because it allows "able to support a student individually" [T151; T574]. It is a teaching modality that "possibility of carrying out tasks in deferred time" [T37], allows a "closer connection with parents" [T74], and the "valuing the work of teachers by families" [T316].

Teachers had to prepare lessons that provided students with moments of learning. Teachers were used to preparing lessons for face-to-face teaching and suddenly had to organise tasks for Emergency remote learning while maintaining an effective relationship with the contents. Emergency remote learning requires digital skills from teachers, students and guardians. Schools, teachers, and students had to learn to use a set of digital resources that would allow them to communicate remotely and continue the work developed so far in the school's physical space. Teachers recognize that emergency remote learning requires a "domain of digital tools" [T348] but also "improving students' digital skills" [T305]. It favours "new technological learning and greater diversity of strategies to reach students" [T302], promotes "student autonomy and a gradual mastery of new technologies" [T319], and the "students' digital literacy" [T377; T635]. This is because it leads to the "stimulation of the need to think outside the box, of things differently, produce new activities that bring us closer to a hybrid teaching" [T90].

Time seems to be another aspect mentioned by teachers, as they state that in emergency remote learning, "students manage their time better, promote organization and autonomy in the learning process" [T787]. For the teacher, it also brings "greater tranquillity at work and better time management" [T819]. It leads to "stimulation of the need to think outside the box, to things differently, produce new activities that bring us closer to hybrid teaching" [T90] and the "capacity to reinvent being a teacher to maintain an effective teacher-student relationship by promoting autonomy, creativity and emotions" [T204].

For some teachers, emergency remote teaching was a period of articulation, integration and collaboration. Teachers report that this collaboration between peers helped exchange materials for lessons and work methodologies to promote learning. Emergency remote learning led to adapting the teaching process to the new reality of living in confinement. In this sense, teachers and students needed to be trained in platforms and methodologies adjusted to e-learning.

The "training, better class time management, and pedagogical differentiation" [T196] allowed teachers to "knowledge of new digital approaches to capture student attention and interest" [T228]. It led students to have "autonomy of students in working with email, online meetings, sending photos, accessing the links " [T296]. Teachers also mentioned feeling the "increased parental involvement and accountability" [T245] during emergency remote learning and "greater accountability of students" [T461]. Also, they referred that "some students are more motivated because they feel more comfortable, less inhibited in distance learning, they only participate much more than before" [T234].

The collaborative work during the emergency remote learning contributed from teachers' perspective to the improvement of student learning outcomes. In addition, teachers admit that peer collaboration helped sustain teachers' professional development in technological resources and work dynamics adapted to e-learning. The “collaborative spirit among colleagues and sharing” [T47] was another aspect mentioned by the teachers that helped them since “the teachers created several support channels for the exchange of experiences” [T176]. In [Table 5], we present the teachers' perception of teachers asked about the positive aspects of emergency remote learning:

**Table 5:** Categories of analysis from teachers’ responses about positive aspects about ERL.

Dimension	Teacher
Positive aspects about emergency remote learning	<p>"It is a challenging experience for teachers, students, and parents" [T12].</p> <p>"I have learned a lot, but I work even harder" [T70].</p> <p>"Innovation! Diversified strategies! Increased digital literacy for students and teachers" [T216].</p> <p>"Process more focused on pedagogical differentiation, on the student, on learning" [T4].</p> <p>"Students with great motivation " [T20].</p> <p>"The possibility of carrying out tasks in deferred time" [T37].</p> <p>"The collaborative spirit among colleagues and sharing" [T47].</p> <p>"It exceeded my expectations with regard to the attitude of the students, the degree of attention they dedicate to the class and to participation" [T65].</p> <p>"Closer connection with parents" [T74].</p> <p>"Stimulation of the need to think outside the box, do things differently, produce new activities that bring us closer to a hybrid teaching" [T90].</p> <p>"Create autonomy and responsibility in students" [T129].</p> <p>"Students work more autonomously, they have to organize themselves" [T137].</p> <p>"Being able to support a student individually" [T151].</p> <p>"There is no action, no side conversations, allowing time savings, and a greater number of students to intervene/participate in classes" [T169].</p> <p>"Teachers have created multiple support channels for exchanging experiences" [T176].</p> <p>"It has allowed us to see education from a different perspective, challenging us to reflect on practices that were established and outdated" [T187].</p> <p>"Training, better class time management and pedagogical differentiation" [T196].</p> <p>"Ability to reinvent being a teacher to maintain an effective Teacher-Student relationship promoting autonomy, creativity and emotions" [T204].</p> <p>"Digital training for teachers and students" [T211].</p> <p>"It was the use of new technologies by students and educational guardians. Students managed to adapt and greatly improved their performance" [T214].</p> <p>"Knowledge of new digital approaches to capture student attention and interest" [T228].</p> <p>"Some students are more motivated because they feel more comfortable, less inhibited in distance learning, so they participate much more than before" [T234].</p> <p>"Increased parental involvement and accountability" [T245].</p> <p>"Online training, support, and sharing among schoolmates and on social networks" (T276).</p> <p>"Autonomy of students in working with email, meet, sending photos" (T296)</p> <p>"Remote learning allows for new technological learning and greater diversity of strategies to reach students. It is the reinvention of teaching" (T302).</p> <p>"Improving students' digital skills" (T305).</p> <p>"Constant challenge, valuing the work of teachers by families and collaborative work" (T316).</p> <p>"Student autonomy and a gradual mastery of new technologies" (T319).</p> <p>"Promoting Presentations Using Digital Tools" (T333).</p> <p>"Domain of digital tools" (T348).</p> <p>"Students' digital literacy has increased" (T377).</p> <p>"I felt calmer in relation to covid 19" (T381, T601).</p> <p>"Greater follow-up and involvement of educational guardians" (T425).</p> <p>"Greater accountability of students" (T461).</p> <p>"Possibility of leaving a video about the contents taught, later they can see it again and clear up their doubts" (T504).</p> <p>"Getting out of the comfort zone, need to use platforms that were previously unknown" (T529).</p> <p>"The possibility of giving immediate feedback to the student and being able to accompany the student in a more individualized way, but expense of my time" (T537).</p> <p>"Personalizing learning" (T574).</p>

<p>"Improving the digital literacy of all and the autonomy and responsibility of students" (T592).          "Increasing students' digital literacy, diversification of work tools" (T635).          "Excellent project work opportunity" (T636).          "Development of students' autonomy and creativity" (T684, T974).          "Students manage their time better, promote organization and autonomy in learning" (T787).          "Greater tranquillity at work and better time management" (T819).          "Increased participation by some students" (T914).</p>
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We present the teachers' perception of teachers asked about the negative aspects of emergency remote learning in the next [Table 6]:

**Table 6:** Categories of analysis from teachers' responses about negative aspects about ERL

Dimension	Teacher
Negative aspects about emergency remote learning	<p>"Students with few routines in the context of autonomous and teamwork" [T20].            "Impotence to individualize teaching and help students who need more guidance. Impotence to overcome difficulties with network cuts, mine, and the students. Limitation of manual tasks. Limitation of time in front of the screen, mine and the students" [T28].            "The great appreciation of mandatory synchronous times" [T37].            "Lack of digital equipment in some students. Difficulty in supporting students on the part of guardians (lack of digital skills)" [T65].            "Working 12 or more hours a day" [T76].            "Lack of materialization with abstract content materials" [T88].            "Connection problems" [T89, T859].            "Lack of training for most teachers. Insufficient digital skills on the part of students" [P90].            "Internet failures and digital illiteracy of guardians" [T91].            "Lack of resources and technological knowledge of families" [T93].            "Lack of sharing activities, experiences from and with colleagues!" [T129]            "The fact that some students have someone to carry out their work" [T137].            "Little digital literature for parents. Little autonomy for students" [T140].            "Number of daily working hours" [T141].            "Students without computer resources and without internet" [T150].            "Lack of Technological Means for Everyone at Home" [T165].            "Lack of guidelines, lack of support from the Directorates" [T176].            "The lack of IT equipment for E@D" [T179].            "Presence and interference of parents in classes, the difficulties for students with measures to support inclusive learning are accentuated" [T433].            "The planning of appealing tasks and the consequent creation of suitable materials, the looking for solutions, the attempt at training (technological and pedagogical) takes too long" [T492].            "Little respect from family members for online classes" [T408].            "The lack of technological equipment and Internet network of some students" [T423].            "Too much time in front of the screens with a permanent feeling that the work is not paying off" [T498].            "Managing the short Synchronous class time, lack of interest by some students and guardians in monitoring students, the ease of colluding with students' "builds", the lack of materials, but making good use of them. Students do not know, working with digital tools" [T527].            "The biggest difficulty I feel is not being able to reach everyone in the same way, whether due to lack of equipment, or lack of quality on the net or lack of ability to deal with the tools they have at their disposal. Many are experts at playing, but they don't know how to make a word document" [T537].            "Difficulties in creating credible evaluation moments" [T572].            Difficulty in creating group dynamics among students" [T606].            "Lack of preparation of the entire educational context does not allow for an implementation of E@D even as an emergency" [T636].            "Excess of computer hours; inability to provide differentiated attention to students; lack of rest and permanent stress to prepare digital materials to support classes" [T678].            "Lack of equipment, difficulty in managing task follow-up, in the case of families in telecommuting, with student children... above all emotional wear..." [T718].            "Lack of equipment and internet network for students" [T728].</p>

	<p>"Lack of training to know how to handle platforms more rigorously" [T735].</p> <p>"Students with different rhythms end up suffering more because we are not by their side to guide them and help them perform the exercises" [T761].</p> <p>"Lack of training/lack of experience" [T780].</p> <p>"There are no efficient technical conditions for this teaching to work. Not even the students who are following this E@D at school have the net and computer conditions to work in full" [T897].</p> <p>"Social inequality is one of the biggest limitations in distance learning" [T964].</p>
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As the principal negative aspects of emergency remote learning, teachers mentioned the lack of time to prepare classes, the lack of access to equipment or internet connectivity, the lack of training, and the difficulty in evaluating students during emergency remote learning. The "lack of digital equipment in some students" [T65] and "connection problems" [T89, T859] are problems presented by the teachers for the "difficulty in supporting students on the part of guardians (lack of digital skills)" [T65]. The "lack of training for most teachers" [P90], the "digital illiteracy of guardians" [T91], the "lack of sharing activities, experiences from and with colleagues" [T129], plus the "insufficient digital skills on the part of students" [P90] are also difficulties pointed out by teachers in emergency remote learning.

Students' autonomy is essential for the school period and a necessary competence for their professional future. Unfortunately, one of the difficulties presented by the teachers in emergency remote learning was the lack of autonomy of their students that would allow them to solve problems autonomously, be proactive to study and have emotional independence. The lack of "routines in the context of autonomous and teamwork" [T20] of students and "impotence to individualize teaching and help students who need more guidance" [T28] worried teachers. The "presence and interference of parents in classes, the difficulties for students with measures to support including learning are accentuated" [T433], "the fact that some students have someone to do their work" [T137], and "little respect from family members for online classes" [T408], led to "social inequality" [T964] and "difficulties in creating credible evaluation moments" [T572]. The fatigue is associated with the "number of daily working hours" [T141], the "too much time in front of the screens with a permanent feeling that the work is not paying off" [T498], and "lack of guidelines, lack of support from the directors" [T176] created disorientation in teachers. They state that "the planning of appealing tasks and the consequent creation of suitable materials, the looking for solutions takes too long" [T492].

## DISCUSSION

The findings of this study are of great importance because there is a lack of previous research regarding this area and how Portuguese schools engaged students during the COVID-19 pandemic. Data analysis showed that the remote learning during the COVID-19 pandemic challenged the school population to have essential technologies Infrastructure to roll out remote learning effectively. The transformation in the education sector during the COVID-19 pandemic was a transition phase where teachers became YouTubers recording video lessons and learned to use different digital tools to support their classes. The virtualization of educational systems during the COVID-19 pandemic led to pedagogical models and practices that the teacher habitually used, which shows the teacher to assume new ones (Moreira, et al., 2020). About the steps to follow in online courses, Lencastre, Ilin, Bronze, Francica and Milios (2020), state that it is essential to have the curriculum as modules where each of these modules will contain a brief presentation, an activity, and a quiz. Some teachers already used various technological resources in their classes, but most were not used by them. These results are in line with those found by Marek, Chew, and Wu (2021). More than half of teachers have never incorporated technology beyond the basics of PowerPoint slides or discipline-specific hardware/software in their pedagogical practice.

On the other hand, the remaining teachers reported the use of various online platforms such as Google Meet, Facebook groups, Zoom, Kahoot, Microsoft Teams, and Edpuzzle, showing a great inequality in teachers' habits. As a result, teachers and students had to deal with remoteness and isolation and changes to virtual learning (Green, Burrow & Carvalho, 2020). In general, the technologies used by teachers were utilized from a purely instrumental perspective, reducing methodologies and practices to purely transmissive teaching (Moreira, Henriques & Barros, 2020).

In emergency remote learning, teachers felt calmer because they felt safe from getting the virus. Our results are in line with the results obtained by Onyefulu (2021). According to this author, during the emergency remote learning, teachers did not need to travel to schools; they are not physically with students and therefore feel protected against the covid-19 virus.

With the transition between face-to-face teaching and distance learning modalities, the teachers felt a significant workload. They, therefore, felt exhausted with a lack of motivation to develop their profession. Furthermore, they felt disoriented with the introduction of new technologies to them for video calls and remote monitorization of students. These results are in line with the results of Gren, Burrow and Carvalho (2020), as according to these authors, the abrupt transition from face-to-face teaching to the online mode introduced new tools into the routine of teachers, adding difficulties about internet access and the use of these new pedagogical resources.

During emergency remote learning, several challenges were posed to teachers, including lack of collaborative planning, not being part of the decision-making process, and lack of clear guidelines on how to work together (Onyefulu, 2021). Teachers felt that they worked much more during the emergency remote teaching period to prepare and implement classes than they did in face-to-face teaching. These results agree with those found by Marek, Chew, and Wu (2021), who in their study explored the experiences of higher education faculty that converted classes to distance learning during the COVID-19 pandemic; these authors found that most respondents experienced much higher workloads and the stress than in face-to-face classes. Teachers consider that emergency remote learning was “a challenging experience for teachers, students and parents” (T12) which “deeps inequalities and difficulties” (T88, P243, P366) because it “does not affect the learning of a large part of the students” (T91). In remote emergency learning, there is a physical classroom to provide students with information and guidance usually offered at the beginning of a class, which is why it is essential to draw up a plan where students can consult all the information and advice necessary to follow online classes (Monteiro, Moreira & Lencastre, 2015). Students must participate (and actively engage) in distance learning during the pandemic period (Cicha, Rizun, Rutecka & Strzelecki, 2021).

According to Cicha, Rizun, Rutecka and Strzelecki (2021), students already have digital skills that allow them to monitor distance learning. However, our teachers reported technical difficulties their by students. They report that the lack of training and the constant need to use digital resources led to “improving students' digital skills” (T305). However, teachers admitted that emergency remote learning had positive aspects. They said that it was “an excellent opportunity for the 21st-century school” (T316) and hope that in the “post-pandemic period, there can be a real transition to the digital, without making a clean sheet of all the investment made” (T177). They recall the fact that it is “extremely tiring for students and teachers for the number of hours they are in front of a computer”. However, they recognize that the emergency remote teaching period had positive aspects such as the development of the “digital literature of teachers and students” (T97, T216) and that “it will have a strong impact on pedagogical transformation” (T801). However, they also consider that it would be more effective if “all teachers were trained to work with digital platforms and tools to create dynamic and interactive lessons and if all students had access to technological resources” (T674). They claimed to be a process “more focused on pedagogical differentiation, on the student, on learning” (T4), allowing students to “perform tasks in a deferred time” (T37), allowing them to establish a “closer connection with parents” (T74) and to “create autonomy and responsibility in students” (T129, T186). Our results are like those found by Khlaif, Salha, and Kouraichi (2021). According to these authors, most teachers participating in their study reported that online teaching, learning increased digital inequality and threatened their digital privacy negatively influenced their involvement in own professional activity. What affected teachers' professional activity (Khlaif, Salha & Kouraichi, 2021).

Adopting an online learning environment is not just a technical issue for the interviewed teachers; it is a pedagogical and instructional challenge. Emergency remote learning affected the structuring of teaching and learning practices by requiring students to engage with teachers remotely using technology, even with lack of connectivity, and in some cases, lack of both connectivity and digital literacy of teachers and students (Green, Burrow & Carvalho, 2020). According to Khlaif, Salha, and Kouraichi (2021), the attitude of teachers and the quality of content are factors that influence student engagement.

## CONCLUSIONS

The process worked very well for some of these teachers, and we can say that they were autonomous, self-motivated, and responsible. However, the findings also show that a part of the teachers felt difficulties in connectivity, lack of technological resources, and lack of training that would allow them to develop technology-enhanced learning. The use of technology during remote learning has become a potent force in transforming the implemented educational landscape. However, teachers recognize that they need to know effective methods to apply this model online or hybrid and coordinate for a more effective teaching practice with technologies. The teachers' point of view reinforces the importance of continuous training in using an online or hybrid teaching model. This highlights the importance of the teachers' involvement to promote the quality of remote learning. It was fascinating to verify that teachers saw emergency remote learning as an opportunity to evolve pedagogically

and digital skills. According to the results, aspects such as the teacher-student relationship, pedagogical differentiation and collaboration between teachers were already necessary, but emergency remote learning gave them more visibility.

There are academic and social implications that can be taken out of this study. From an academic point of view, our results indicate that remote learning programs can use students' learning effectively through emergency remote teaching. However, it is noteworthy that teachers report a greater personal effort to implement this emergency remote teaching. From a social point of view, emergency remote teaching can make it possible to maintain social distancing measures and at the same time, allowed to maintain online contact between teachers and students to continue teaching and learning work outside the school's physical space. So, this study pointed out the effectiveness of emergency remote learning.

We seek to reflect on teachers' perspectives to help decision making, and findings suggest that part of the teachers are receptive to remote learning; however, further research is needed to study the pedagogical acceptance of distance learning by teachers in a post-pandemic COVID-19 environment.

As a final remark, it seems relevant to us in future studies to understand how the experience through the emergency remote learning, the use with digital tools, and differentiated teaching methodologies changed teachers' practices in a post-pandemic COVID-19 environment.

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### LIMITATIONS OF THE STUDY

The study analyses a limited sample of teachers. So, it offers insights for further research, but it cannot propose generalized conclusions. Data collection occurred during the emergency times of covid-19 pandemic, the, which could have affected teacher's responses and emotions.

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