# THE RELEVANCE OF TECHNOLOGY IN THE CONTEXT OF EMERGENCY REMOTE TEACHING

## *A RELEVÂNCIA DA TECNOLOGIA NO CONTEXTO DO ENSINO REMOTO EMERGENCIAL*

## *LA RELEVANCIA DE LA TECNOLOGÍA EN EL CONTEXTO DE LA ENSEÑANZA REMOTA DE EMERGENCIA*

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**ABSTRACT**: This article reflects upon the possibilities of remote teaching in the context of Emergency Remote Teaching (ERT), a response to the suspension of in-person activities during the COVID-19 pandemic. Against this backdrop, the article examines resources, strategies, and pedagogical possibilities mediated by digital technologies experimented with by higher education institutions (HEIs) to ensure the continuity of academic activities. The reorganization of educational practices has driven the incorporation and reappraisal of digital technologies and environments, expanding possibilities for interaction, communication, access, and student monitoring. In this context, remote teaching highlighted not only the availability of technology but also the need to articulate it with methodological approaches consistent with educational objectives and students' concrete conditions. It is concluded that emergency remote teaching has enhanced possibilities already present in the educational landscape while simultaneously revealing challenges regarding interaction, pedagogical mediation, and the participation of those involved in the educational process.

**KEYWORDS**:Education. Emergency remote teaching. Social isolation. Technology. Covid-19.

***RESUMO***: *Este artigo reflete sobre as possibilidades do ensino remoto no contexto do Ensino Remoto Emergencial (ERE), resposta à suspensão das atividades presenciais durante a pandemia de covid-19. A partir desse cenário, o artigo aborda recursos, estratégias e possibilidades pedagógicas mediadas pelas tecnologias digitais experimentadas pelas instituições de ensino superior (IES) para assegurar a continuidade das atividades acadêmicas. A reorganização das práticas educativas impulsionou a incorporação e a ressignificação de tecnologias e ambientes digitais, ampliando as possibilidades de interação, comunicação, acesso e acompanhamento dos estudantes. Nesse contexto, o ensino remoto colocou em evidência não apenas a disponibilidade das tecnologias, como também a necessidade de articulá-las a propostas metodológicas coerentes com os objetivos educacionais e com as condições concretas dos estudantes. Conclui-se que o ensino remoto emergencial potencializou possibilidades já integradas ao cenário educacional, ao mesmo tempo que evidenciou desafios relacionados à interação, à mediação e à participação dos agentes envolvidos no processo educativo.*

***PALAVRAS-CHAVE***: *Educação. Ensino remoto emergencial. Isolamento social. Tecnologia. Covid-19.*

***RESUMEN***: *Este artículo reflexiona sobre las posibilidades de la enseñanza a distancia en el contexto de la Enseñanza a Distancia de Emergencia (EDE), como respuesta a la suspensión de las actividades presenciales durante la pandemia de COVID-19. Partiendo de este escenario, el artículo aborda los recursos, las estrategias y las posibilidades pedagógicas mediadas por las tecnologías digitales que han puesto en práctica las instituciones de educación superior (IES) para garantizar la continuidad de las actividades académicas. La reorganización de las prácticas educativas ha impulsado la incorporación y la redefinición de las tecnologías y los entornos digitales, ampliando las posibilidades de interacción, comunicación, acceso y seguimiento de los estudiantes. En este contexto, la enseñanza a distancia ha puesto de manifiesto no solo la disponibilidad de las tecnologías, sino también la necesidad de articularlas con propuestas metodológicas coherentes con los objetivos educativos y con las condiciones concretas de los estudiantes. Se concluye que la enseñanza a distancia de emergencia ha potenciado posibilidades ya integradas en el panorama educativo, al tiempo que ha puesto de manifiesto retos relacionados con la interacción, la mediación y la participación de los agentes implicados en el proceso educativo.*

***PALABRAS CLAVE***: *Educación. Enseñanza a distancia de emergencia. Aislamiento social. Tecnología. Covid-19.*


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## Introduction

All Brazilian states suspended in-person classes during the pandemic and adopted emergency remote-teaching strategies to maintain educational activities. Education faced particularly complex challenges during this period because teaching methods had to be combined with digital tools that students could use easily. The extent to which content was absorbed became a concern, given that many students, especially those enrolled in public schools, could not access the platforms because they did not have a computer or tablet and could connect to the internet only through mobile phones.

Education administrators had to seek emergency solutions to ensure the continuity of school activities, mobilizing and adapting remote-teaching methods and strategies with the support of digital technologies. This occurred unexpectedly and abruptly, as in-person classes were suspended and replaced by remote activities, requiring teachers and students to adapt quickly to the technologies adopted. The term technology comes from the Greek *tékhnē*, meaning "technique, art, craft," together with the Greek word logos, which refers to a "body of knowledge" (O que é […], s.d., our translation).

Technology can be understood as the mobilization of scientific, technical, and practical knowledge to create, develop, and use instruments, processes, and systems intended to achieve particular purposes. From this perspective, technology is not limited to the artifacts or devices used; it also encompasses the knowledge, practices, people, and relationships involved in its production and appropriation. In education, this understanding makes it possible to view technologies as elements connected to pedagogical practices, forms of interaction, and the concrete conditions under which teaching and learning take place.

Digital technologies comprise a broad set of resources, devices, platforms, and environments that have transformed various dimensions of social life, including work, leisure, and education. Among them, the internet occupies a prominent place, particularly because it expands opportunities for communication, interaction, access to information, and knowledge sharing. In education, its incorporation has diversified the organization of pedagogical practices, creating new possibilities for interaction between teachers and students and for accessing and producing knowledge. These transformations, however, do not result exclusively from the technical features of the resources used, but also from how people appropriate them and connect them to educational aims and concrete conditions. The growing presence of digital technologies in society therefore affects social and educational practices, changing how people teach, learn, communicate, and participate.


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In emergency remote teaching (ERT), different digital tools and platforms were incorporated into pedagogical practices, performing distinct functions according to their characteristics and potential uses. Cipriani, Moreira, and Carius (2021) identified web-conferencing tools such as Google Meet and Microsoft Teams, as well as applications such as WhatsApp, among the technologies most widely used by teachers during remote teaching.

In this context, WhatsApp can be understood as a resource for communication and interaction through instant messaging; Microsoft Teams as a collaboration and communication platform; Google Meet as a videoconferencing tool for synchronous activities; and Google Forms as a resource for creating questionnaires, activities, assessment instruments, and data-collection tools. Although they offer distinct functions, these tools were used in combination to support communication, interaction, task completion, and student monitoring during ERT.

Table 1 presents several digital tools and platforms used in remote teaching to support communication, interaction, task completion, and student monitoring.

**Table 1** – Digital tools and platforms

| Tools | Platforms |
|---|---|
| WhatsApp | Instant-messaging and communication application/platform |
| Google Meet | Videoconferencing and synchronous-communication platform |
| Google Forms | Digital tool for creating forms and questionnaires and collecting data |
| Microsoft Teams | Digital platform for collaboration, communication, and the organization of educational activities |

Source: Prepared by the authors.

The article is organized into sections that connect its conceptual foundations with a discussion of the relationship between digital technologies and ERT. It first discusses the concepts of education, development, and technology, establishing the theoretical framework guiding the analysis. It then addresses ERT, considering the context in which it was adopted and the possibilities it provided for continuing educational activities mediated by digital technologies.

Next, it examines virtual learning environments and the different digital resources and platforms used in remote classes, highlighting their potential for communication, interaction,


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and the organization of pedagogical activities. Through this discussion, the article seeks to understand how digital technologies were mobilized in ERT and what possibilities and challenges emerged from that experience. Finally, it presents its concluding remarks, revisiting the main points discussed and identifying issues for reflection on the use of digital technologies in educational processes.

## *Development*

An extraordinary situation abruptly halted in-person classes and led higher education institutions (HEIs) to make immediate and creative decisions. During the pandemic, educational institutions had to reorganize their practices to make it possible to continue educational activities remotely. This process required adaptations in several areas, including training teachers and students to use digital technologies, preparing administrative teams, adapting technological infrastructure, and, in some cases, reorganizing curricula and pedagogical strategies. The main challenge of remote teaching fell to teachers, who had to review their classroom dynamics and course content without impairing student learning, while also keeping students interested and motivated. This task became even more difficult when students faced problems accessing the internet.

## *Remote teaching*

ERT expanded the possibilities for continuing educational activities while in-person classes were suspended. These possibilities included synchronous classes held through videoconferencing platforms, which enabled real-time communication and interaction between teachers and students. Such activities, however, depended on material and technological conditions, including internet access and the availability of suitable devices, as well as equipment such as cameras, microphones, and headphones.

Beyond content delivery, remote teaching also made it possible to diversify pedagogical strategies and modes of student participation. In this context, teachers could foster more autonomous inquiry and learning by recommending books, articles, texts, and other digital resources that encouraged students' curiosity, research, and independent construction of answers. This perspective shifts the focus from the mere transmission of information to pedagogical mediation, in which the teacher guides, raises questions, selects resources, and creates conditions for students to engage actively with knowledge.

During the COVID-19 pandemic, which was marked by the suspension of in-person activities and the need for social distancing, these possibilities took on an emergency character. Digital technologies therefore began to play an important role in reorganizing educational


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practices by enabling different forms of communication, interaction, and access to content. At the same time, this experience showed that using technology alone does not ensure learning, since outcomes are related to access conditions, pedagogical choices, teacher mediation, and forms of student participation.

Remote-teaching strategies became important for supporting the continuity of studies and reducing the risk of dropout during the period of social isolation recommended by the World Health Organization. The strategies used included synchronous and asynchronous activities. In synchronous activities, teachers and students participate at the same time and interact in real time through videoconferencing tools and other digital resources. Although this arrangement enables forms of communication and interaction similar to those found in in-person classes, it has its own characteristics related to access conditions, time management, and the possibilities for participation mediated by technology. In asynchronous activities, materials, content, and assignments are made available in virtual learning environments or on other digital platforms, allowing students to organize part of their studies according to their availability and learning pace.

In this context, ERT required the reorganization of pedagogical strategies and methods capable of connecting different times, spaces, and forms of interaction. Student participation became particularly important, especially in activities that encouraged research, problem solving, knowledge production, and the monitoring of one's own learning path. Autonomy, however, should not be understood as independence from the teacher, but as something developed through pedagogical guidance, monitoring, and mediation. Teachers therefore remain essential for selecting and organizing content, proposing activities, guiding students, and creating conditions for active and meaningful participation in teaching and learning processes mediated by digital technologies.

### *Mobile learning*

Known as mobile learning, this modality refers to teaching and learning processes mediated by mobile devices such as smartphones and tablets. Its use expands opportunities to access educational content, activities, and interactions at different times and in different places, providing greater flexibility in the organization of studies. During ERT, mobile devices became particularly important, especially where access to computers was limited, and served as important resources for communication, access to teaching materials, and the completion of educational activities.


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Some students already used mobile devices for learning-related activities, such as reading e-books, conducting internet research, participating in study groups and discussion forums, and accessing educational environments and platforms such as Google Classroom. In this context, mobile learning expands opportunities to access educational content, resources, and interactions, allowing certain activities to be carried out at different times and in different places. During ERT, these possibilities became more important because educational activities mediated by digital technologies had to be maintained.

Mobile technologies, however, are not in themselves a solution to educational challenges. Their contributions depend on access conditions, how students and teachers appropriate them, and, above all, how they are integrated into pedagogical proposals. They can help broaden access to educational resources, communication, and student participation, provided that they are connected to learning objectives and pedagogical-mediation strategies.

Knowledge construction involves students' active participation and can be fostered by situations that awaken curiosity, inquiry, and an interest in learning. In this process, the teacher plays a fundamental role as a mediator, creating conditions for students to formulate questions, explore different sources, undertake challenging activities, and establish relationships between the knowledge studied and their experiences. Rather than merely transmitting content, teaching involves guiding, problematizing, monitoring, and providing support so that students develop autonomy and engage meaningfully in learning processes.

Dowbor (1998) draws attention to transformations in how knowledge is produced, circulated, and accessed, emphasizing the need for schools to reconsider their role in a context marked by the rapid dissemination of information and by social and technological change. From this perspective, schools are called upon to reflect on their didactic and methodological conceptions and on how teaching is organized in order to respond to transformations affecting society and the ways in which knowledge is produced and appropriated.

In this context, student motivation and engagement are relevant to learning processes. An interest in learning can encourage participation, curiosity, and a more active stance toward knowledge. Motivation, however, should not be understood exclusively as an internal student characteristic, because it is also influenced by pedagogical relationships, teaching proposals, learning conditions, and the social and educational contexts in which individuals are situated.


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### *Virtual learning environments (VLEs)*

When in-person classes were suspended in March 2020, HEIs realized that they were facing a new process characterized by the need to use platforms and virtual learning environments and by dependence on internet access. Most institutions did not have adequate structures to meet the demands of this new reality. Many teachers had to adapt, learn to use new technologies, and teach remotely through digital resources. The process was initially turbulent, but institutions, teachers, and students gradually adapted to the new circumstances.

According to Valentini and Soares (2010), virtual learning environments (VLEs) are web-based spaces organized to foster teaching and learning processes by bringing together pedagogical conditions, strategies, and interventions that enable knowledge construction through interaction among students, teachers, and objects of knowledge. In these environments, students can access content, participate in activities, and engage in different forms of interaction through internet-connected devices. This feature expands the possibilities for organizing studies, especially asynchronous activities, which can be completed at different times according to students' circumstances and routines.

VLEs can bring together different resources and tools for organizing and developing pedagogical activities, including video lessons, audio, videoconferences, chats, discussion forums, virtual libraries, questionnaires, and spaces for submitting and monitoring assignments. Their function is therefore not limited to storing and providing content; it also involves organizing learning experiences and mediating interactions among participants in the educational process.

In internet-mediated education, organizing hypermedia learning environments involves connecting content, activities, resources, and interfaces structured according to specific pedagogical intentions. According to França (2009), this organization establishes a relationship between instructional design and users' interaction needs. The configuration of virtual environments can thus foster different forms of participation and interaction, depending both on the resources made available and on the pedagogical strategies guiding their use.

Virtual learning environments make it possible to monitor students' activities and interactions, expanding opportunities for communication, guidance, and pedagogical support. In this context, teachers play a fundamental role in mediating teaching and learning processes, mobilizing pedagogical and technological knowledge to plan activities, guide students, monitor their participation, and provide feedback throughout the process. To do so, they must develop


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not only familiarity with digital tools but also the ability to integrate them coherently with pedagogical intentions and learning objectives.

Andrade and Santos (2010) emphasize that interaction in virtual environments depends on teachers' and students' meaningful and intentional use of synchronous and asynchronous tools. From this perspective, the presence of interactive resources does not in itself guarantee the quality of interaction or learning. How these resources are appropriated and connected to pedagogical proposals can foster communication, collaboration, and knowledge construction. The selection and use of tools should therefore be related to learning objectives and to the characteristics of the activities undertaken.

Communication plays a central role in this context. In virtual environments, much interaction may occur through written language, which requires proposals to be presented clearly, instructions to be precise, language to be appropriate, and attention to be paid to students' different forms of participation. At the same time, multimedia resources expand the possibilities for communication and interaction by combining texts, images, audio, video, videoconferencing, and other digital resources.

The development of digital technologies therefore expands opportunities to teach and learn at different times and in different places, but it does not replace pedagogical intentionality or teacher mediation. Virtual learning environments should prioritize experiences grounded in dialogue, collaboration, participation, and knowledge exchange, provided that technological resources are integrated into pedagogical proposals that consider learners, contexts, and the purposes of learning.

According to Rocha and Santos (2025), a virtual learning environment enables teachers to monitor their students regularly and serve as facilitators of the learning process, using their pedagogical knowledge to guide and mediate activities.

The use of VLEs offers advantages such as group interaction, access to information, organized and flexible teaching, new forms of interaction among participants, interactive learning, and new possibilities for assessment and teacher practice. Pedagogical mediation is essential for meaningful learning to occur. Teachers must seek a balance among different educational paradigms, teaching as research, and the progressive approach, with the support of new digital technological resources and methods that promote collaborative learning (Rocha; Santos, 2025).


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### *Technologies in remote classes*

Digital technologies and technological resources had already attracted attention from different sectors of society, including education. Before the COVID-19 pandemic, digital platforms, virtual learning environments, and various communication and interaction tools were already used by HEIs, especially in distance education and in programs combining in-person and virtual activities. These resources expanded opportunities to access content, communicate, interact, and monitor academic activities.

With the suspension of in-person activities caused by the pandemic, HEIs had to reorganize their practices to ensure the continuity of the educational process. In this context, ERT made intensified use of different technologies and digital resources, including videoconferencing platforms, virtual learning environments, communication applications, and tools for completing and monitoring activities. Institutions that had operated predominantly through in-person teaching began to incorporate these resources into their practices on an emergency basis, expanding teachers' and students' experience with different forms of communication and interaction mediated by digital technologies.

This process showed that technological resources could expand the possibilities for organizing educational activities in situations of physical distancing, but it also revealed the importance of access conditions, participants' preparation, and pedagogical mediation. ERT should therefore not be understood as synonymous with distance education, but as a circumstantial response to the interruption of in-person activities that intensified the use of remote-teaching technologies and strategies. Several digital tools and platforms mobilized during this period are presented below.

### *Video lessons with interactive whiteboards*

Education is one of the fields significantly affected by technological transformation, as digital technologies have expanded the possibilities for organizing, communicating, and developing pedagogical activities. Even before the COVID-19 pandemic, audiovisual resources such as video lessons were already used in different educational contexts, especially in distance education. With the adoption of ERT, these resources also began to be used more extensively by institutions that had operated predominantly in person, providing alternatives for maintaining educational practices while in-person classes were suspended.

Video lessons stand out among these resources and can take different forms and perform different pedagogical functions. According to Spanhol and Spanhol (2009, p. 2, our translation), "[…] a video lesson is an audiovisual resource produced to achieve specific learning


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objectives". In ERT, video lessons were used both in synchronous activities, with teachers and students participating simultaneously, and in asynchronous activities, through the recording and subsequent availability of content.

Synchronous videoconferencing activities enabled real-time communication and interaction between teachers and students, allowing time for presentation, discussion, clarification of questions, and the development of activities. To encourage student participation, these activities could be announced in advance, enabling students to organize their schedules and the conditions required for access. Recorded video lessons, in turn, provided greater flexibility in accessing content and allowed students to follow the activities at other times, especially when they could not participate in synchronous activities at the scheduled time.

The use of interactive resources also expanded the possibilities for presenting and exploring content during remote activities. Digital whiteboards, annotation tools, screen sharing, and other resources enabled teachers to highlight information, record explanations, develop diagrams, and interact with the materials presented. The presence of these resources, however, does not in itself guarantee greater interaction or learning. Their contribution depends on how they are incorporated into pedagogical proposals, the objectives defined by the teacher, and the concrete conditions of student participation.

In this sense, video lessons and interactive resources can be understood as possibilities for pedagogical mediation that, when connected to appropriate teaching strategies, can diversify forms of communication, content presentation, and student participation. In ERT, their use demonstrated both the potential of digital technologies to support the continuity of educational activities and the need for planning, pedagogical intentionality, and the monitoring of learning processes.

Live classes are one form of synchronous interaction mediated by digital technologies, allowing teachers and students to participate in activities at the same time and communicate in real time. In remote teaching, students can be notified of these activities in advance, enabling them to organize their schedules and the conditions required for participation. During classes, different digital resources can be used to foster communication, clarify questions, discuss content, and carry out activities interactively.

Live online lectures can also serve as strategies for expanding access to and interaction with different forms of knowledge and experience. They may address topics related to the content studied, deepen discussions, and place students in contact with researchers, teachers, or professionals with knowledge and experience in particular fields. In this context, higher


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education institutions can promote meetings with outside guests, expanding opportunities for participation and knowledge sharing, including among large numbers of students.

Real-time interaction is one possibility enabled by digital technologies in these meetings. Through resources such as chat, microphones, questions, and comments, students can participate in discussions and engage in dialogue with teachers, speakers, and other participants. Digital tools can thus support different forms of communication and interaction, contributing to the collective construction of knowledge when they are connected to pedagogical objectives and proposals that encourage student participation.

### *Audio and videoconferencing*

With the development of digital technologies, audio- and videoconferencing expanded the possibilities for communication and interaction among people in different locations. Audioconferencing enables communication predominantly through audio, whereas videoconferencing adds image transmission, allowing participants to communicate through sound and video in real time. In remote teaching, these resources enabled synchronous activities and fostered communication between teachers and students and among students themselves.

Videoconferencing can be used both for communication between two people and for activities involving larger groups. One configuration is a point-to-point connection, in which two locations are linked and participants can hear and see one another, establishing two-way communication in real time. As digital platforms expanded, multiparty videoconferences also became common, allowing the simultaneous use of resources such as screen sharing, chat, presentations, polls, and collaboration tools.

According to Cruz (2009, n. p., our translation), “videoconferences can facilitate the teaching and learning process through well-planned and creative actions capable of promoting participation and managing and assessing student learning”. The contribution of these resources to educational processes is therefore related not only to their technical functions, but primarily to how they are incorporated into pedagogical planning and used to foster participation, interaction, and the monitoring of learning.

In remote teaching, teachers and students can establish two-way communication through internet-connected computers, tablets, and smartphones. Synchronous activities conducted by audio- or videoconference allow time for presentation, dialogue, clarification of questions, content discussion, and activity development. These possibilities, however, depend on access to devices, connection quality, and the forms of participation available to those involved.


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### *Chats and forums*

Chat is a synchronous communication tool that enables real-time interaction among participants. In ERT, it expanded communication between teachers and students, helping clarify questions, conduct discussions, and monitor certain activities during virtual meetings. According to Marcuschi (2008, p. 201, our translation), educational chats are "synchronous chat-style interactions for educational purposes, generally to answer questions, provide individual or group assistance, and address previously established topics" (our translation). Chat can thus be incorporated into pedagogical planning as a resource for immediate interaction, especially in activities requiring real-time responses, questions, and dialogue.

In addition to chat, discussion forums are important spaces for interaction mediated by digital technologies. Unlike chat, which is predominantly synchronous, forums enable asynchronous communication, allowing teachers and students to post messages, read other participants' contributions, and formulate their responses at different times. This feature can provide more time for reflection and the development of ideas, as well as allow discussions to continue over a given period.

In ERT, chats and forums could be used in complementary ways. While chat supported more immediate interactions, such as answering questions, debating during synchronous activities, and communicating in real time, forums enabled longer discussions in which students could present arguments, comment on classmates' contributions, formulate questions, and revisit different aspects of a topic. In both cases, messages could remain recorded, allowing interactions to be revisited and discussions to be monitored.

The use of these resources can foster interaction, collaboration, and the collective construction of knowledge, provided that it is connected to clear pedagogical objectives. Scherer (2009) understands the forum as a space in which teachers and students question, engage in dialogue, and move toward understandings constructed collectively. From this perspective, the teacher's role goes beyond merely providing a discussion space; it includes proposing questions, problematizing contributions, guiding debates, and creating conditions for different perspectives to be considered.

In this sense, the information circulation in virtual learning ambients can assume a distinct dynamic from that based exclusively on content transmission. Silva, Coelho and Valente (2009) highlights tha in this spaces participants can leave the predominantly receptive role and involve themselves in interactive, collaborative and cooperative processes. However, this manner doesn't occur automatically because the simple disponibility of tools.The


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interactions quality depends on activities organization, teacher mediation, access conditions and student engagement.

Forums can also function as spaces for recording and monitoring discussions, since contributions remain available for consultation and can be revisited as activities develop. This characteristic helps build a record of interactions and allows students to revisit questions, arguments, and contributions presented by their classmates and teacher.

Thus, in ERT, chats and forums offered distinct and complementary possibilities for communication and interaction. Whereas chat is characterized by simultaneous interaction, forums extend the time available for participation and reflection. The pedagogical use of these resources can help bring teachers and students closer together, encourage participation, and expand possibilities for the collective construction of knowledge, provided that it is integrated into intentional pedagogical proposals and the concrete conditions of participants.

One of educators' greatest challenges is transforming the classroom, whether in person or virtual, into a space of interaction among participants in which everyone has an opportunity to express ideas and contribute to knowledge construction. Teachers are responsible for coordinating group work, dynamics, and other activities that stimulate interaction and discussion of the topics presented. It is also important to listen to students, value and encourage their participation, and create an environment in which they are not afraid to make mistakes or expose themselves before their classmates.

Although many teachers had experience and training in teaching, they encountered difficulties in reorganizing established pedagogical practices under the conditions imposed by ERT. The suspension of in-person activities required rapid changes in the organization of teachers' work, the selection of methodological strategies, and forms of communication with and monitoring of students. In many cases, this process took place in a context requiring immediate adaptation, which was not always accompanied by specific training or adequate conditions for the pedagogical use of digital technologies.

It is also important to consider that teaching takes place under different institutional conditions. Course plans, learning objectives, content, and methods must be coordinated so that proposed activities have pedagogical coherence. In remote teaching, this coordination became even more important because transferring in-person practices to digital environments without the necessary methodological reorganization could limit opportunities for student participation and interaction.


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Pedagogical planning should therefore establish relationships among objectives, content, methodological strategies, and forms of learning assessment, considering students' characteristics and the concrete conditions under which activities are carried out. Interaction among class participants is an important element in this process, especially in contexts mediated by digital technologies, in which communication and monitoring must be intentionally organized.

Student participation in remote teaching also involved the ability to organize study time and activities. Asynchronous proposals, in particular, required students to manage part of their routines to review materials, complete assignments, and meet established deadlines. The autonomy required for this organization, however, should not be understood as the student's exclusive individual responsibility. Teachers were responsible for guiding the learning path, establishing clear deadlines and criteria, organizing activities, and providing monitoring and feedback throughout the process.

In remote teaching, as in other educational contexts, the teacher mediates learning experiences, creating conditions for students to participate, investigate, engage in dialogue, and construct knowledge. This work also involves considering students' different social and cultural contexts and the relationships shaping educational processes. The use of digital technologies in remote teaching therefore does not eliminate the centrality of teachers' work; on the contrary, it underscores the need for planning, pedagogical intentionality, mediation, and monitoring so that technological resources can be effectively integrated into teaching and learning processes.

## Final considerations

The COVID-19 pandemic significantly altered social and educational relations and imposed abrupt changes on the organization of school and academic activities. Given the need for physical-distancing measures and the consequent suspension of in-person activities, educational institutions, teachers, and students had to reorganize their practices and forms of communication within a short period. In this context, digital technologies played an important role in creating conditions for educational activities to continue, although their use varied according to the institutional, pedagogical, and social conditions of each setting.

This article aimed to reflect on the possibilities for using digital technologies that were intensified in ERT and on their relationship with teaching and learning processes. The discussion showed that resources including virtual learning environments, video lessons, audio-


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and videoconferences, chats, forums, and virtual libraries were mobilized to support communication, interaction, access to content, and the development of activities while in-person activities were suspended. In this process, the internet provided essential infrastructure for most of these resources to function and for interactions among the people involved in educational processes to be maintained.

The experience of ERT, however, showed that the availability of digital technologies is not in itself sufficient to ensure meaningful teaching and learning. Incorporating these resources requires planning, pedagogical intentionality, and teacher mediation, as well as institutional conditions that support their use. In this context, teachers had to reorganize practices, methods, and forms of student monitoring, developing knowledge and strategies to integrate different digital resources with educational objectives. Students, in turn, were required to adopt new ways of organizing their study time and activities and to become familiar with different digital tools and environments.

The experience also made inequalities related to internet and device access and to adequate conditions for participating in educational activities more visible. Students from different socioeconomic backgrounds experienced different possibilities for access and participation, demonstrating that the presence of digital technologies in educational processes is directly related to the concrete conditions under which they are appropriated. The technological challenges experienced during the period therefore cannot be understood solely as matters of technical proficiency; they are also matters of access, inclusion, participation, and educational equity.

In this sense, ERT intensified possibilities for communication, interaction, and access to educational resources that were already integrated, to varying degrees, into practices mediated by digital technologies. At the same time, the experience exposed limitations and challenges related to infrastructure, teacher education, student participation, and the pedagogical organization of activities. Rather than showing that technologies can replace in-person practices, the period revealed the importance of understanding their possibilities and limitations and integrating them into educational purposes in contextualized and intentional ways.

It may therefore be concluded that digital technologies played an important role in reorganizing educational activities during ERT, creating conditions for maintaining communication and different forms of interaction and access to knowledge while in-person activities were suspended. Their contribution, however, does not result exclusively from their


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technical characteristics, but from how they are appropriated by participants, connected to pedagogical proposals, and sustained by existing institutional and social conditions. The experience of the pandemic thus reinforces the need to understand the relationship between technology and education beyond the availability of tools, considering pedagogical mediation, teacher education, student participation, inclusion, and the concrete conditions under which educational processes take place.


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