


Digital Technologies and School Geography: Teaching Knowledge Produced During Emergency Remote Education (2020-2021)

Francisco Fernandes Ladeira¹


¹Universidade Federal de São João del-Rei (UFSJ), São João del-Rei, Minas Gerais, Brasil
ffernandesladeira@yahoo.com.br

 0000-0002-0004-8384

Tânia Seneme do Canto²

²Universidade Estadual de Campinas (Unicamp),
Instituto de Geociências.
Campinas, São Paulo, Brasil.

taniasc@unicamp.br

 0000-0003-0299-8268

revista

Geo 
USP
espaço e tempo

Volume 29 • n° 1 (2025)

ISSN 2179-0892

e-230053

How to cite this article:

LADEIRA, F.F.; CANTO, T.S. Digital Technologies and School Geography: Teaching Knowledge Produced During Emergency Remote Education (2020-2021). **Geousp**, v. 29, n. 1, e-230053, jan./ apr. 2025. ISSN 2179-0892. Available at: <https://www.revistas.usp.br/geousp/article/view/230053>. doi: <https://doi.org/10.11606/issn.2179-0892.geousp.2025.230053.en>.



This article is licensed under the Creative Commons Attribution 4.0 License.

Digital Technologies and School Geography: Teaching Knowledge Produced During Emergency Remote Education (2020-2021)

Abstract

This paper presents findings from theoretical reflections and empirical field research aimed at identifying and analyzing the pedagogical knowledge produced by teachers during the Covid-19 pandemic through the use of Digital Information and Communication Technologies (DICT) within School Geography. To this end, we administered questionnaires to Geography teachers working in São Paulo State's public school system, comprising questions about teacher training, pedagogical knowledge, and educational practices mediated by digital technologies. Most participating teachers had neither received formal training in DICT nor engaged in professional development activities that enabled pedagogical reflection or practical application of digital technologies in teaching Geography. Consequently, we found that the teachers' knowledge of DICT that emerged during Emergency Remote Teaching in School Geography was predominantly experiential, developed through professional practices encompassing equipment management, continuous professional learning, pedagogical planning, and instructional methodology.

Keywords: school geography; pedagogical knowledge; DICT; pedagogical practices; remote teaching.

Tecnologias digitais e geografia escolar: saberes docentes produzidos durante o ensino remoto emergencial (2020-2021)

Resumo

Este trabalho apresenta os resultados de uma reflexão teórica e de pesquisa em campo que buscou identificar e analisar os saberes que os professores produziram na pandemia da Covid-19 a partir do uso das Tecnologias Digitais da Informação e Comunicação (TDIC) na geografia escolar. Para tanto, aplicamos questionários para professores de geografia da Rede Estadual de São Paulo, com perguntas relacionadas à formação de educadores e aos saberes docentes e práticas pedagógicas mediados

pelas tecnologias digitais. Como a maioria dos professores participantes desta pesquisa não foi formada para entender as TDIC e suas relações com o ensino de geografia, tampouco, posteriormente, participou de atividades que possibilitassem pensar e/ou trabalhar pedagogicamente com as tecnologias digitais, constatou-se que os saberes docentes com as TDIC que emergiram na geografia escolar, no Ensino Remoto Emergencial, foram, essencialmente, experienciais, surgidos nas práticas profissionais dos professores (ligados ao manuseio de equipamentos, à formação continuada, ao planejamento pedagógico e à metodologia de ensino).

Palavras-chave: geografia escolar; saberes docentes; TDIC; práticas pedagógicas; aulas remotas.

Tecnologías digitales y geografía escolar: enseñanza del conocimiento producido durante la educación a distancia de emergencia (2020-2021)

Resumen

Este trabajo presenta los resultados de una reflexión teórica e investigación de campo que buscó identificar y analizar el conocimiento que los docentes produjeron durante la pandemia Covid-19 a través del uso de las Tecnologías de la Información y la Comunicación Digital (TID) en la Geografía Escolar. Para ello, administramos cuestionarios a profesores de Geografía, con preguntas relacionadas con la formación de educadores y la enseñanza de conocimientos y prácticas pedagógicas mediadas por tecnologías digitales. Como la mayoría de los docentes participantes en esta investigación no fueron capacitados para comprender TDIC y sus relaciones con la enseñanza de la Geografía, ni participaron posteriormente en actividades que permitieran pensar y/o trabajar pedagógicamente con las tecnologías digitales, se encontró que los saberes docentes con las TDIC que surgieron en Geografía Escolar, en la Enseñanza Remota de Emergencia, fueron, esencialmente, vivenciales, surgidos en las prácticas profesionales de los docentes (vinculados al manejo de equipos, la formación continua, la planificación pedagógica y la metodología de la enseñanza).

Palabras clave: geografía escolar; enseñar conocimientos; TDIC; prácticas pedagógicas; clases remotas.

Initial considerations

In 2020 and 2021, nearly the entire planet was impacted by the Covid-19 pandemic, the name given to the disease caused by the novel coronavirus (Sars-CoV-2), first identified in December 2019 in Wuhan, the capital and largest city of Hubei Province, People's Republic of China. Among the emergency measures adopted by government authorities, in order to prevent the rapid spread of the new coronavirus among the population, we can mention the restriction of movement of people, cancellation of cultural events, closure of borders, creation of sanitary barriers, mandatory use of masks in public spaces, large-scale adoption of teleworking, closure of services considered non-essential and the suspension of face-to-face classes, affecting 87% of students worldwide (approximately 1.5 billion children and young people), in more than 165 countries.

Thus, amidst a health crisis in which any activities leading to gatherings of people were prohibited, educational continuity relied on the implementation of "Emergency Remote Teaching", characterized by remotely conducted educational activities.

The term "remote" denotes spatial distance, reflecting the geographical separation created by prohibitions against teachers and students attending educational institutions, aimed at preventing the rapid dissemination of the virus. The "emergency" aspect is associated with the cancellation of the original pedagogical plans designed for the 2020 school year, initially intended for face-to-face learning.

In this new educational modality, implemented without any type of discussion or preparation of professionals, immediacy is established, in which the teacher "needed, for yesterday, to master, invest in, support and use technological tools in the remote class model" (Antunes Neto, 2020, p.33), being forced to adapt their teaching methodologies to try to obtain, in some way, learning results (Oliveira, 2020). As articulated by Vieira and Seco (2020), the interruption of in-person educational activities forced educational managers, teachers, and students into an unprecedented transformation, necessitating a new educational model grounded in DICT and shaped by virtual educational methodologies.

According to scholars such as Coelho (2021), Oliveira (2021), and Souto and Morais (2021), Geography, among other curricular subjects in basic education, was distinctly impacted by Emergency Remote Teaching. This distinctiveness arises because Geography is a discipline fundamentally embedded, enacted, and constructed within schools, characterized by personal interactions and discussions between teachers and students, classroom debates, the use of tangible materials (such as maps and globes), and field excursions (which serve as the primary laboratory for integrating theoretical and practical knowledge). Consequently, Geography teachers needed to become increasingly creative to facilitate students' exploration of geographic spaces remotely, each from their own home.

The very foundational concepts of Geography acquired new interpretations: territory began to be understood through vaccine territorializations against Covid-19, the concept of place was reconsidered within the context of social distancing, and landscape—typically perceived through sensory experiences of space—came to exhibit reduced flows.

Thus, as concluded by Galiano and Santos (2021, p. 5), the pandemic provided a significant opportunity “to rethink the school environment, teaching-learning relationships, and the importance of empowering teachers and students to access information more constructively and efficiently”. Within this pandemic context, DICT assumed a central role, becoming the primary means of communication between teachers and students. Even teachers previously unfamiliar with DICT engaged with digital technologies for real-time online classes, recording/editing lessons, creating teaching materials, attending school meetings, and discussing Covid-19 news available online with students.

Given this context, the present study aims to identify and analyze the pedagogical knowledge developed by teachers regarding the use of digital technologies in School Geography during Emergency Remote Teaching. To this end, questionnaires containing both objective and subjective questions were administered to Geography teachers working in São Paulo state public schools. These questionnaires addressed teacher training and the pedagogical knowledge and practices mediated by digital technologies before, during, and after Emergency Remote Teaching.

Following Tardif (2002), we define pedagogical knowledge as encompassing the understanding, competencies, abilities, strategies, and techniques constructed and mobilized by teachers in their daily professional activities. Such knowledge can be categorized into four distinct areas: (a) disciplinary knowledge, (b) professional knowledge, (c) curricular knowledge, and (d) experiential knowledge.

Disciplinary knowledge relates to established academic fields and bodies of knowledge. *Curricular knowledge* involves objectives, discourses, content, and methods through which schools classify and deliver socially determined knowledge, selected as models for scholarly culture and training. *Professional knowledge* comprises insights produced by educational researchers and subsequently conveyed through teacher-training institutions. Finally, *experiential knowledge* specifically emerges from teachers’ daily practices, their functional tasks, and familiarity with their work environments.

To structure our research clearly, this article is organized into the following sections, in addition to these “Initial Considerations”: “Methodology,” “Results and Discussion,” and “Final Considerations”. In the “Methodology” section, we describe the online questionnaire used in our field research. The “Results and Discussion” section presents and analyzes data collected through these questionnaires. Lastly, the “Final Considerations” summarize and synthesize the main findings, offering reflections on the pedagogical knowledge Geography teachers in São Paulo state schools developed through DICT during Emergency Remote Teaching.

Methodology

The field research reported here involved administering online questionnaires to fifty Geography teachers from São Paulo state’s public basic education system. The questionnaire comprised three objective (“closed-ended”) questions, in which respondents selected from predetermined options, and thirteen subjective (“open-ended”) questions, allowing participants to freely express their perspectives on the proposed topics. Through this empirical procedure, it became possible to move beyond theoretical abstractions found in books and reports, capturing

instead how teachers conceptualized, integrated, and reflected upon digital technologies during remote instruction.

To facilitate data analysis, the questions presented to participants were grouped into three sections. The first addressed initial and continuing teacher education. The second explored pedagogical practices involving DICT in School Geography prior to Emergency Remote Teaching. The third section examined the pedagogical knowledge and practices that emerged within School Geography during Emergency Remote Teaching.

The questionnaire, created via *Google Forms*, was distributed to participants by email.

Teachers' professional profiles were determined based on several criteria: type of educational degree (Geography Teaching License or Geography Bachelor's Degree), degree format (face-to-face or distance learning), academic qualifications (ongoing undergraduate studies, completed undergraduate degree, lato sensu postgraduate degree, master's, or doctorate), classroom teaching experience, and the São Paulo state region where they taught during Emergency Remote Teaching.

Among respondents, 75.5% held a teaching license in Geography, 22.4% possessed both teaching licenses and bachelor's degrees in Geography, and 2% held only a bachelor's degree. Regarding degree format, 88% completed their studies in face-to-face programs, while 12% pursued distance learning. Concerning academic qualifications, 48% held only an undergraduate degree, 30% had a lato sensu postgraduate qualification, 14% held a master's degree, and 8% had completed doctoral studies. In terms of teaching experience, 26% had 11–15 years in the classroom, 24% between 0–5 years, 20% more than 21 years, 16% had 16–20 years, and 14% had between 6–10 years of professional experience.

The geographic distribution of respondents across São Paulo state during Emergency Remote Teaching was as follows: Greater São Paulo (36%), Metropolitan Interior (32%), Western São Paulo (10%), Baixada Santista (8%), Northern Coast (6%), Vale do Paraíba (6%), and Vale do Ribeira (2%).

In designing this questionnaire, our intent extended beyond merely gathering data for analysis and incorporation into our study. We also aimed to encourage teachers, through their responses, to reflect broadly on their professional practices and specifically on the relationships between DICT and Geography education.

Having outlined these considerations, the questions included in the questionnaire were as follows:

- 1) Were digital technologies part of your initial teacher education? But how?
- 2) During your initial teacher education, were there specific courses designed to relate digital technologies to Geography teaching in basic education? How were these courses structured?
- 3) Besides formal coursework, did you participate in any projects or other activities (study groups, seminars, discussion forums, etc.) during your initial education that enabled you to reflect on or engage with digital technologies in teaching Geography? Describe.

- 4) After your initial education, did you undertake any courses or activities that enabled you to reflect on or engage with digital technologies in teaching Geography? Describe.
- 5) What role did digital technologies have in your school before the Covid-19 pandemic (prior to Emergency Remote Teaching)?
- 6) Before the Covid-19 pandemic (prior to Emergency Remote Teaching), how frequently did you use digital technologies in your Geography lessons?
() Never () Rarely () Occasionally () Frequently
- 7) For what reasons did you “use” or “not use” digital technologies in your classes?
- 8) During Emergency Remote Teaching, did you undertake any professional training focused on working with digital technologies?
() Yes () No
- 9) During the period of Emergency Remote Teaching, which methodologies and instructional strategies did you use to integrate digital technologies into your lessons?
- 10) What were the main difficulties and challenges in your teaching practice during Emergency Remote Teaching?
- 11) What were the main difficulties and challenges you faced regarding the use of digital technologies during Emergency Remote Teaching?
- 12) How did the transition from in-person to online teaching impact on your daily work and your relationships with students and other members of the school community?
- 13) How did Emergency Remote Teaching influence your reflections and pedagogical practices regarding digital technologies?
- 14) During Emergency Remote Teaching, did you acquire any insights or knowledge related to the pedagogical use of digital technologies? If yes, please specify these insights or knowledge.
- 15) Upon returning to face-to-face classes after Emergency Remote Teaching, did you start using digital technologies more intensively in your professional practice?
() Yes, I started using digital technologies more intensively in my pedagogical practice.
() After returning to in-person classes, the intensity with which I use digital technologies in my pedagogical practice remained the same as before Emergency Remote Teaching
() I did not use digital technologies in my professional practice before Emergency Remote Teaching, but I started using them after returning to face-to-face classes.
() I did not use digital technologies in my professional practice before Emergency Remote Teaching and continue not using them after returning to face-to-face classes.
() I began teaching during the period of Emergency Remote Teaching

16) Based on your daily experiences with digital technologies during Emergency Remote Teaching, what pedagogical knowledge have you integrated into your current professional practice?

In the following section, we present the findings from our field research, based on questionnaire responses from fifty Geography teachers in São Paulo state public schools. The questions addressed teacher education and pedagogical knowledge and practices mediated by DICT before, during, and after Emergency Remote Teaching.

Results and discussions

Based on field research conducted with public school teachers in São Paulo State between the second semester of 2022 and the first semester of 2023, it became possible to understand how DICT has been integrated into School Geography before, during, and after Emergency Remote Teaching.

Findings from the first set of questions—addressing initial and continuing teacher education—revealed that undergraduate programs generally conceive digital technologies primarily as communication tools within the academic community or as sources for research. These programs do not typically offer specific courses or academic activities to discuss the educational potential of emerging technologies or critically analyze their role in contemporary society. Furthermore, these programs fail to engage in reflections on how continuous digital connectivity affects human cognition and, consequently, the construction of geographical knowledge.

In their responses (some of which are presented below), teachers did not mention studying educational theories related to understanding the dilemmas stemming from the “education and digital technologies” interface during their undergraduate education. Nor did they indicate whether certain subjects included in Geography curricula, such as Psychology or Sociology of Education, critically addressed challenges imposed by cyberculture on society broadly and educational institutions specifically.

[Digital technologies] were present in the form of computer labs provided by the university as support for research and introductory learning of geoprocessing.

There was no integration of technology during initial education; thus, we now have to adapt it into daily teaching practices.

I didn't pursue [continuing education] courses due to lack of time; I only started thinking about technology during the pandemic.

[Courses] provided examples and suggestions of innovative digital technologies that could enhance my teaching practices.

These findings suggest that Geography teacher training programs should continue to emphasize the importance of teaching as a profession and uphold essential scientific and pedagogical principles for effective teaching and learning processes. However, curricular structures must adapt to contemporary demands, considering both the opportunities and challenges of accessing knowledge through available information and communication technologies (Santos, 2022).

The second group of questions—addressing pedagogical practices involving digital technologies before Emergency Remote Teaching—revealed that 71% of surveyed teachers rarely integrated DICT into their teaching methods prior to the pandemic.

Earlier studies by Balanskat, Blamire and Kefala (2006) and Pacheco (2019) reached similar conclusions, highlighting several factors contributing to teachers' resistance to technology use in classrooms. These factors included limited available time to acquire or deepen technological skills, inadequate financial resources for professional development, lack of equipment, poor school infrastructure, embarrassment over unfamiliarity with technology, complacency, lack of motivation, confidence issues, or simply disinterest.

The third set of questions—focusing on the pedagogical knowledge and practices that emerged during Emergency Remote Teaching—allowed the creation of the following table (Chart 1), which describes the knowledge and skills developed by Geography teachers from São Paulo's state public schools during the 2020 and 2021 academic years. This pedagogical knowledge relates specifically to DICT management, continuing education, pedagogical planning, and teaching methodology.

Chart 1 – Emergent Pedagogical Knowledge in School Geography during Emergency Remote Teaching.

Knowledge Developed	Examples
DICT management	<ul style="list-style-type: none"> > Creating slide presentations. > Accessing digital platforms. > <i>Online</i> video editing. > Producing educational materials. > Hosting virtual meetings.
Continuing education	<ul style="list-style-type: none"> > Constantly updating knowledge about the pedagogical use of digital resources through reading and courses. > Recognizing the importance of DICT for teaching-learning processes. > Greater openness to learning collaboratively with peers and students about multiple potentials of computers and mobile devices.
Pedagogical Planning.	<ul style="list-style-type: none"> > Lesson preparation in virtual environments. > Increased use of online videos, texts, and images as research sources for lesson preparation. > Virtual sharing of study materials. > Allowing remote participation of subject-area experts in classes, regardless of geographical distance.

Chart 1 – Cont.

Teaching Methodology	<ul style="list-style-type: none"> > Developing new ways to teach and explain educational content. <ul style="list-style-type: none"> > Digital mapping tools for teaching Cartography. > Integrating new digital resources into classroom dynamics. <ul style="list-style-type: none"> > Gamification to enhance learning. > Using <i>online</i> satellite imagery to study environmental degradation. <ul style="list-style-type: none"> > Creating and sharing videos about Brazilian biomes. > Employing the game “Pocket City Free” for Urban Geography lessons. > Increasing appreciation of classroom spatiality and interpersonal interactions. <ul style="list-style-type: none"> > Conducting virtual learning workshops. > Using <i>online</i> scale models to explore Physical Geography topics. > Canva digital resources to discuss “landscape” and “place” categories. > Exploring spatial dimensions and climates through flight simulators (PC/smartphones). <ul style="list-style-type: none"> > Using Minecraft to study Brazil’s morphoclimatic domains. > Overcoming prejudices, fears, or resistance to integrating DICT into professional practice.
----------------------	---

Source: Prepared by the authors, based on field research data (2023).

As evident from the data presented above, the exceptional period of remote instruction not only accelerated the integration of DICT in schools but also altered the ways teachers understand, appropriate, and pedagogically utilize digital technologies. One teacher notably described Emergency Remote Teaching as “a significant leap in technological learning—something that otherwise might have taken years to recognize and grasp”.

Among the several types of pedagogical knowledge developed, those related to teaching methodologies are particularly notable for being *specific* to School Geography. While skills such as managing digital resources, recognizing the importance of continuous professional development with DICT, virtual sharing of study materials, and using online resources (videos, texts, images) as teaching aids could broadly apply to teachers from other disciplines, methodologies like digital mapping in Cartography lessons, *online* scale models for Physical Geography, and satellite imagery analysis for environmental degradation studies represent forms of knowledge *uniquely tied to Geography teaching*. Many Geography teachers constructed such knowledge *exclusively* during the Emergency Remote Teaching period.

Moreover, it is important to emphasize that websites, games, apps, and platforms—such as *Google Jamboard*, *Pocket City Free*, *Flipgrid*, *Kahoot*, and *Plickers*—were generally not designed explicitly for pedagogical purposes or to meet the unique challenges of remote teaching. Nevertheless, educators successfully appropriated these tools, recognizing their potential within Geography instruction and effectively integrating them with curricular content.

Final considerations

During Emergency Remote Teaching, DICT served not only traditional pedagogical functions—such as supplemental instructional resources—but also became central to the teaching-learning process, acting as the sole means of communication within the educational community.

However, our field research findings revealed that most Geography teachers in São Paulo's state school system had neither taken courses specifically addressing the integration of DICT with Geography teaching nor participated in activities designed to foster pedagogical reflection on digital technologies during their undergraduate education. Even after graduation, only slightly more than half of these teachers engaged in professional development focused on DICT.

It would admittedly be controversial to suggest that initial or continuing teacher education programs held before the Covid-19 pandemic could have anticipated and provided content for a situation as unprecedented as Emergency Remote Teaching. Nevertheless, one might expect Geography teachers to draw upon previously acquired pedagogical methodologies and DICT knowledge and adapt these to the remote teaching format. According to our findings, this expectation was generally not met.

Additionally, Geography teachers described the guidelines provided by São Paulo's educational authorities—summarized as the CMSP app and a limited set of normative documents—as insufficient for effective DICT use during Emergency Remote Teaching. Statements such as “I received no support”, “The Education Secretariat did not offer adequate support”, and “The remote teaching materials from the state were disconnected from the students' realities; I had to create my own,” were common both in informal conversations and in responses to our questionnaire.

Thus, based on the aforementioned observations, we infer that the pedagogical knowledge with DICT that emerged within School Geography during Emergency Remote Teaching was predominantly *experiential*, arising directly from teachers' professional practices. In other words, when classes shifted abruptly from in-person to remote, Geography teachers, lacking proper preparation or theoretical grounding in pedagogical technology use, were forced to learn through practice—by trial and error—adapting as best as they could to this unprecedented educational situation.

Despite insufficient support from educational authorities, outdated electronic equipment, exhaustion, and social isolation due to the pandemic, psychological stress, extensive working hours, and inadequate internet connectivity, among other adverse conditions, teachers still managed to develop substantial pedagogical knowledge regarding DICT use.

This experiential pedagogical knowledge involved both technical aspects (creating slides, mastering electronic devices, accessing online platforms, initiating virtual meetings, online video editing, producing educational resources) and methodological aspects (virtual sharing of study materials, gamification for enhancing student learning, preparing lessons for virtual environments, conducting virtual learning workshops, using online scale models, and aligning app or website content with Geography curricula).

Such knowledge, developed during Emergency Remote Teaching without systematic reference to existing educational theories or doctrines, was subsequently integrated into teachers' professional identities, pedagogical styles, and repertoires for classroom technology use even after the pandemic period.

Only one teacher among all respondents answered negatively to the question, "Based on your everyday experiences with DICT during Emergency Remote Teaching, what knowledge do you currently bring to your professional practice?" stating explicitly: "I have brought none, as none existed". Adapting the Roman legal principle "*exception probat regulam in casibus non exceptis*" (*the exception proves the rule*) to our findings, we affirm this case represents an exception rather than the norm.

Seventy-six percent of participants indicated that, upon returning to face-to-face classes following Emergency Remote Teaching, they intensified their use of digital technologies in professional practice, including lesson planning. Furthermore, many teachers reported that staying continuously updated on pedagogical applications of digital resources has become an integral part of their professional reflection in the post-pandemic context.

This data is particularly significant because, prior to the pandemic, digital technologies were minimally present (or entirely absent) in daily school activities at approximately 65% of São Paulo state public schools, due to poor infrastructure, outdated equipment, limited internet access, or teachers' and students' difficulties operating electronic devices. Consequently, the pedagogical application of DICT before Emergency Remote Teaching was relatively infrequent.

Therefore, it can be inferred that adopting Emergency Remote Teaching not only accelerated DICT integration into Geography instruction, as previously highlighted, but also promoted new reflections, learnings, methodologies, and instructional strategies among Geography teachers. Thus, a new "*habitus*"—an integrated set of skills and knowledge employed by teachers professionally—related to DICT use in School Geography has emerged, a shift largely absent before the pandemic.

Nonetheless, substantial difficulties and challenges were also reported during Emergency Remote Teaching, such as the lack of student internet access and teachers' difficulties handling digital technologies—particularly among those with over twenty years of classroom experience. These adverse conditions were predominantly observed among educators teaching in economically disadvantaged communities and regions within São Paulo state.

References

- ANTUNES NETO, Joaquim Maria Ferreira. Sobre ensino, aprendizagem e a sociedade da tecnologia: por que se refletir em tempo da pandemia? **Revista Prospectus**, v. 2, n. 1, p. 28-38, 2020. Disponível em: <https://prospectus.fatecitapira.edu.br/index.php/pst/article/view/31>. Acesso em: 23 jul. 2024.
- BALANSKAT, Anja; BLAMIRE, Roger; KEFALA, Stella. The ICT impact report: a review of studies of ICT impact of schools in Europe. **European Schoolnet**, Brussels, Belgium, 2006. Disponível em: https://oei.org.ar/ibertic/evaluacion/sites/default/files/biblioteca/31_theict_impact_report_in_europe.pdf. Acesso em: 25 ago. 2024.

- COELHO, Karolayne Araújo. **Os desafios dos professores de Geografia em decorrência do ensino remoto emergencial no município de Fortaleza e Região Metropolitana**. 2021. Trabalho de Conclusão de Curso (Licenciatura em Geografia) – Universidade Federal do Ceará, Fortaleza, 2021.
- GALIANO, Leonardo Oliveira; SANTOS, Nilva Oliveira dos. O ensino remoto (ERE) em foco: perspectivas, considerações e desafios. *In*: ANAIS DO I SIMPÓSIO NACIONAL DE METODOLOGIAS ATIVAS NA EDUCAÇÃO PROFISSIONAL, 1, 2021, Rio Branco. **Anais (...)**. Rio Branco: IFAC, 2021. Disponível em: [https://www.even3.com.br/anais/lsimaept2021/331012-O-ENSINO-REMOTO-EMERGENCIAL-\(ERE\)-EM-FOCO--PERSPECTIVAS-CONSIDERACOES-E-DESAFIOS](https://www.even3.com.br/anais/lsimaept2021/331012-O-ENSINO-REMOTO-EMERGENCIAL-(ERE)-EM-FOCO--PERSPECTIVAS-CONSIDERACOES-E-DESAFIOS). Acesso em: 2 set. 2024.
- OLIVEIRA, Victor Hugo Nedel. Como fica o ensino de Geografia em tempos de pandemia da Covid-19? **Ensino em Perspectivas**, v. 1, n. 2, p. 1-15, 2021. Disponível em: <https://revistas.uece.br/index.php/ensinoemperspectivas/article/view/4577>. Acesso em: 16 ago 2024.
- OLIVEIRA, Vitória Valentim de. **Geografia escolar e tecnologias digitais: desafios da prática docente diante do Ensino Remoto Emergencial (ERE)**. 2020. Trabalho de Conclusão de Curso (Licenciatura em Geografia) – Universidade Federal do Ceará, Fortaleza, 2020.
- SANTOS, Claudécir dos. Educação e “cibercultura”: como os futuros professores estão se preparando para conduzir processos educativos voltados a estudantes com atenção continuamente parcial? **Acta Educação**, v. 44, e52673, 2022. Disponível em http://educa.fcc.org.br/scielo.php?script=sci_arttext&pid=S2178-52012022000100202&lng=pt&nrm=iso. Acesso em 05 abr. 2024.
- SOUTO, Joyce Caroline de Souza; MORAIS, Nathalia Rocha. Ensino de Geografia em tempos de pandemia: desafios do ensino remoto e das tecnologias na prática docente. **Revista de Ensino de Geografia**, v. 12, n. 22, p. 102-118, 2021. Disponível em: <https://seer.ufu.br/index.php/revistadeensinodegeografia/article/view/76689>. Acesso em: 28 ago. 2024.
- PACHECO, Ana Paula Pinho. **O uso de tecnologia da informação e comunicação no ensino e aprendizagem de Geografia: uma proposta de formação continuada**. 2019. Tese (Doutorado em Geografia). Programa de Pós-Graduação em Geografia. Centro de Ciências Exatas e da Natureza. Universidade Federal da Paraíba, João Pessoa, 2019.
- TARDIF, Maurice. **Saberes docentes e formação profissional**. 2. ed. Petrópolis: Vozes, 2002.
- VIEIRA, Márcia de Freitas; SECO, Carlos Manuel. A Educação no contexto da pandemia de COVID-19: uma revisão sistemática de literatura. **Revista Brasileira de Informática na Educação**, v. 28, p. 1013-1031, 2020. Disponível em: <http://dx.doi.org/10.5753/rbie.2020.28.0.1013>. Acesso em: 30 ago. 2024.

Authorship contributions:

Francisco Fernandes Ladeira – active participation in the discussion of the results; review and approval of the final version of the work.

Tânia Seneme do Canto – participação ativa na discussão dos resultados; aprovação da versão final do trabalho.

Article editor:

Amanda Regina Gonçalves

Received on: 5 December 2024

Approved on: 1 January 2025

LADEIRA, F.F.; CANTO, T.S.