Scientific article

Digital technologies in the context of rural schools: a mapping exercise (2018-2022)

Tecnologias digitais no contexto das escolas do campo: um exercício de mapeamento (2018-2022)

Tecnologías digitales en el contexto de las escuelas rurales: un ejercicio de cartografía (2018-2022)

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Abstract

This article presents an analysis of academic productions on the theme of digital technologies in rural schools. It aims at understanding how these academic productions address the use of digital technologies in rural schools. In order to achieve this purpose, we employed the Theoretical Mapping technique as a methodological strategy for describing the academic productions. The choice of this method, in addition to data collection and organization, enables new insights into the investigated productions. For data collection, we used the Journal Portal of the Coordination for the Improvement of Higher Education Personnel (CAPES), focusing on articles published in journals classified as Qualis A (2018-2022). The mapping

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results identified key elements in the analyzed productions, such as: (i) objectives, encompassing the purposes of the articles; (ii) theoretical framework, identifying the theoretical and conceptual bases that underpinned the research; and (iii) results, focusing on the main analyses and conclusions presented. We conclude that research related to the topic promotes reflections and debates that contribute to improving the quality of education for rural populations, as well as to the construction and strengthening of public policies in the field of Rural Education.

Keywords: Digital Technologies. Rural Education. Theoretical Mapping.

Resumo

O presente artigo apresenta uma análise das produções acadêmicas acerca da temática das tecnologias digitais nas escolas do campo, com o objetivo de compreender de que modo as produções acadêmicas abordam o uso das tecnologias digitais nas escolas do campo. Para atingir esse propósito, empregou-se a técnica de Mapeamento Teórico como estratégia metodológica para a descrição das produções acadêmicas. A escolha deste método, além do levantamento e organização dos dados, possibilita novos entendimentos das produções investigadas. Para a coleta de dados utilizou-se o portal de Periódicos da Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES), com foco em artigos publicados em revistas classificadas como Qualis A (2018-2022). Os resultados do mapeamento identificaram elementos-chave nas produções analisadas, tais como: (i) objetivos, compreendendo as finalidades dos artigos; (ii) referencial teórico, identificando as bases teóricas e conceituais que embasaram as pesquisas; e (iii) resultados, concentrando-se nas principais análises e conclusões apresentadas. Conclui-se que as pesquisas relacionadas à temática promovem reflexões e debates que contribuem para o aprimoramento da qualidade da educação das populações campesinas, bem como para a construção e o fortalecimento de políticas públicas no âmbito da Educação do Campo.

Palavras-chave: Tecnologias Digitais. Educação do Campo. Mapeamento Teórico.

Resumen

Este artículo presenta un análisis de producciones académicas sobre el tema de las tecnologías digitales en escuelas rurales. El objetivo es comprender cómo estas producciones académicas abordan el uso de las tecnologías digitales en las escuelas rurales. Para lograr este propósito, se empleó la técnica de Mapeo Teórico como estrategia metodológica para describir las producciones académicas. La elección de este método, además de la recolección y organización de datos, permite nuevas comprensiones de las producciones investigadas. La recolección de datos utilizó el portal de Periódicos de la Coordinación para el Perfeccionamiento del Personal de Educación Superior (CAPES), centrándose en artículos publicados en revistas clasificadas como Qualis A (2018-2022). Los resultados del mapeo identificaron elementos clave en las producciones analizadas, tales como: (i) objetivos, que abarcan los propósitos de los artículos; (ii) marco teórico, que identifica las bases teóricas y conceptuales que sustentaron la investigación; y (iii) resultados, que se centran en los principales análisis y conclusiones presentados. Se concluye que la investigación relacionada con el tema promueve reflexiones y debates que contribuyen a mejorar la calidad de la educación en las poblaciones rurales, así como a la construcción y el fortalecimiento de políticas públicas en el ámbito de la Educación Rural.

Palabras clave: Tecnologías digitales. Educación rural. Mapeo teórico.

1. Introduction

Modern technology reshapes consciousness and memory even more deeply, imposing a new order on traditional ways of understanding and acting upon the world (Kenski, 1998, p. 59).

In a context marked by rapid and constant transformations, debates and discussions about the significant impacts of technological innovations across various sectors of society have intensified, including in the field of education. These discussions point to a call for reflection, especially when it comes to the context of Rural Education. From the perspective of Kenski (1998), who addresses how technological advances impose new ways for society to understand and act upon the world, it becomes necessary to understand how these changes reverberate in the education of subjects who live in rural areas, since this teaching modality must be developed in close relationship with the reality of rural populations and their communities, integrating their particularities and specificities.

This perspective presupposes the challenge of considering not only the dimensions of the peasant as a social actor, but also the way in which they are embedded in their social environment. Therefore, the theoretical framework of Agnes Heller (1929-2019) is invoked to introduce a reflection on the social role of the teacher and the university within the structure of students' everyday lives, especially in light of the changes that have been taking place in the educational sphere, driven by technological advancement.

Such a scenario is configured as a challenge, given that Heller (1994) understands "everyday life" as the life of the human being in its totality. From this conception, understanding the everyday life of rural populations implies considering a set of elements that encompass their experiences, challenges, values, practices, cultures, daily activities, work, among other aspects. In other words, this is an approach that encompasses economic, political, educational, and social dimensions.

Arruda (2002), in dialogue with some of Heller's ideas, discusses education in contemporary times and emphasizes that teachers must evaluate technological progress, which requires, above all, reflection on this process in order for genuine advances to occur. With regard to universities, the author highlights the need for adaptation to the historical movement experienced by society, so as to prevent these institutions from remaining isolated or closed in on themselves.

From this perspective, Rural Education, by incorporating the use of digital technologies, recognizes the need for human beings, as social actors, to keep pace with societal advances and to participate actively in them. Thus, the introduction of digital technologies in education is somewhat challenging and disruptive, as it does not fit within the frameworks of traditional education. For this reason, it is not sufficient to limit oneself solely to the technical mastery of digital technologies; it is also necessary to understand that, as a disruptive phenomenon, this integration requires methodological and pedagogical adaptations in its approach that take into account the reality of the subjects involved, so that it becomes meaningful to them. Moreover, it must consider the positive and negative impacts that such integration entails.

In light of this Rural Education context, and with the aim of understanding how technologies are used in rural schools and how this use is embedded in the everyday lives of rural populations, this article directs its focus toward the academic literature. Accordingly, it seeks to present the results of a theoretical mapping of academic productions related to the theme of digital technologies in rural schools. The theoretical mapping that underpins this investigation serves two purposes: first, to follow the studies that led to the development of a dissertation; and second, to fulfill the requirements of an assignment proposed in a *stricto sensu* graduate program, specifically in the course Academic Writing, in which the Theoretical Mapping method, as proposed by Biembengut (2008), was addressed.

Hence, this article is organized as follows: initially, it presents a discussion on the impacts of technological advances in rural schools; next, it describes the methodology employed for the selection and analysis of the articles; subsequently, the results and discussions arising from the theoretical mapping are presented; and finally, the concluding remarks are set forth.

2. Impacts of technological advances in rural schools

Based on the considerations above, it becomes pertinent to reflect on how advances in digital technologies over recent decades have transformed society, exerting influence across different spheres of social life (Tavares & Sousa, 2021). In this regard, the widespread dissemination of technologies, software, and global connectivity has significantly altered forms of interaction, learning, and relationships with the world. Innovations such as Augmented Reality, online teaching platforms, Distance Education (DE), Artificial Intelligence (AI), and social media have become part of everyday life.

In the educational field, technological advances have brought new possibilities but have also raised challenges, prompting reflections on the future of education. When it comes to Rural Education, these reflections become even more far-reaching, since it is configured as a teaching modality that seeks to complement the traditional model by establishing a specific focus aimed at serving rural populations, taking into account adaptation to their particularities and specificities.

With regard to the use of technologies, it is currently understood that digital technologies have revolutionized the way we teach and learn (Costa Júnior *et al.*, 2023). However, it must also be acknowledged that such uses have contributed to the widening of pre-existing inequalities. Due to rapid technological advancement, while some individuals have facilitated access to innovative educational resources, others face barriers related to connectivity, the availability of equipment, and the development of digital skills. This scenario highlights the need for approaches that ensure all students, regardless of their background or location, can benefit from the opportunities provided by educational technologies.

As an example of this context, the COVID-19 pandemic stands out, as it exacerbated these issues by giving rise to a series of concerns that affected the educational landscape. The need to adapt teaching methods due to social distancing resulted in the suspension of face-to-face classes, making inequalities in access to education more evident, especially in rural areas where digital connectivity often proved to be limited (Ongaro, 2023). The author further emphasizes that the pandemic and the strategies adopted to ensure the continuity of school activities had considerable impacts on the reality of students in rural schools.

In light of the impossibility of holding in-person classes and the temporary closure of educational institutions, Emergency Remote Teaching (ERT) was adopted as an alternative. Nevertheless, this change not only exposed preexisting disparities in access to education but also contributed to the deepening of inequalities within the educational process (Ongaro, 2023).

When addressing the use of digital technologies in Rural Education, it is observed that these tools can expand access to knowledge and provide new forms of teaching and learning. On the other hand, the precariousness of physical and digital infrastructure, as well as the scarcity of technological, didactic, and pedagogical resources, can intensify the processes of exclusion and inequality experienced by rural students (Mendes *et al*., 2023).

Thus, it becomes inevitable to reflect on the ambivalent nature of technology, which can function as an instrument both of inclusion and exclusion. In this sense, educational systems must be rethought to ensure that technological innovations do not further deepen educational inequalities. Although network infrastructure and access to adequate technological resources are undoubtedly fundamental aspects, it is equally important to consider how these technologies are implemented, taking into account the particularities and needs of the rural school context.

Therefore, the analysis of academic productions on the use of digital technologies in rural schools brings to light discussions that prompt reflection on how these technologies have been employed in a context marked by constant technological transformations. Conversely, it is observed that in certain rural regions these tools have not yet been incorporated into school practices due to persistent limitations in access. This discrepancy results in a dichotomy between those who are able to benefit from these technologies and those who, due to a lack of infrastructure or resources, remain on the margins of this process.

3. Methodology

From this perspective, with the aim of exploring how the investigated theme is presented in academic productions, the Theoretical Mapping method was adopted in order to "identify, become familiar with, and recognize recent research on topics similar to those we intend to address [...]. If we identify in the literature that the proposed research problem has already been resolved, we must seek another problem so as not to reproduce results already obtained by others" (Biembengut, 2008, p. 92).

The mapping approach avoids redundancy in research and directs efforts toward issues that have not yet been explored or sufficiently examined, which fosters the advancement of the field of study. In this regard, the works analyzed were identified through a search conducted in the Journal Portal of the Coordination for the Improvement of Higher Education Personnel (CAPES). The search was carried out using the keywords "Rural Education" and "Technology," with a temporal delimitation covering the period from 2018 to 2022. Initially, the search yielded a total of 124 articles.

In order to refine the results, inclusion and exclusion criteria were established. As inclusion criteria, only articles directly related to the theme of digital technologies in Rural Education were considered. Studies addressing general educational issues or not centered on the use of technologies in this specific context were excluded, as were those published in journals not classified in the Qualis A stratum. This selection was refined through the reading of titles, abstracts, and keywords. At the end of this process, of the 124 articles initially identified, 10 studies met the established criteria, as presented in Map 1.

After the selection process, the articles were analyzed according to the stages of Theoretical Mapping proposed by Biembengut (2008). Aiming at identifying the emerging categories of this study, seven maps were developed. These maps highlight the central aspects of each article and enable the organization of key elements into the following categories: (i) objectives; (ii) theoretical framework; and (iii) results.

Within the scope of Biembengut's (2008) Theoretical Mapping, the term "Map" can be understood as a framework in which elements that identify the collected materials, such as journal articles, undergraduate final papers, master's theses, doctoral dissertations, among others, are presented, offering, at first glance, what may be described as an Identification Map. The content of these maps is related to the elements that the author of the mapping considers necessary to clearly present the research theme. For this reason, in a learning exercise on the use of the Theoretical Mapping Method carried out in the Academic Writing course, seven maps were proposed with the aim of structuring the information from the selected articles. This procedure allowed the author of the mapping to construct a context for the visualization of the analyzed data and, during the collection process, to refine the selection. Accordingly, some of these maps are highlighted in this article. Below is an excerpt from these maps, beginning with Map 1, which identifies the selected articles.

Map 1 – Identification of selected articles

Code	Year	Authors	Title	Journal – Qualis (Four-year period 2017-2020)
A1	2018	SILVA, Vagner Vieira de.; PEREIRA, Elaine Corrêa.; MACHADO, Celiane Costa.	The presence of technology in Rural Education: mapping of national scientific production of the last five years.	*Revista Brasileira de Educação do Campo* – Qualis A4.
A2	2019	BIERHALZ, Crisna Daniela Krause.; FONSECA, Eril Medeiros da.; OLIVA, Izalina.	Conceptions of students of a school of the countryside on technology.	*Revista Brasileira de Educação do Campo* – Qualis A4.
A3	2020	CAMILLO, Cíntia Moralles.; MULLER, Liziany.	Democratization and use of digital technologies in rural schools: a case study.	*Perspectiva* – Qualis A2.
A4	2020	MANFROI, Miraíra Noal.; NOAL, Mirian Lange.	Hoe, pen and mouse: the dialogue between technologies	*Educação em Revista* – Qualis A1.

Code	Year	Authors	Title	Journal – Qualis (Four-year period 2017-2020)
			in continuing education of field teachers in distance mode.	
A5	2021	MÖRSCHBÄCHER, Melina.; REIS, Deyse.	Processes of inclusion and Rural Education: challenges of basic education in the context of new technologies.	*Revista Entreideias* – Qualis A3.
A6	2021	CASTRO, Carlos Henrique Silva de.	University, literacies and new technologies in rural education contexts.	*Texto Livre* – Qualis A1.
A7	2021	SILVA, Maria do Socorro Pereira da.; CUNHA, Adriana Lima Monteiro.; SANTOS, Thaynan Alves do.	Basic education in rural schools in the pandemic context: remote teaching for whom?	*Revista @mbieeducação* – Qualis A2.
A8	2022	MOTA, Carla Rosane da Silva.; KRUMREICH, Fernanda Doring.; KRUMREICH, Gisela Lange do.; PETER, Demaicon Schmidt.; SILVA, Marcos André Betemps Vaz da.	Rural education in times of a pandemic: students' perception at the Family Farm School of the South Region (EFASUL).	*Revista Thema* – Qualis A2.
A9	2022	SOUSA, Rosineide Magalhães de.; VASCONCELOS, Vangela do Carmo Oliveira.; OLIVEIRA, Sílvia Naara da Silva Pinto de.	Interaction, challenges and paths, in times of pandemic, in the context of LEdoC teacher training.	*Acta Scientiarum Language and Culture* – Qualis A1.
A10	2022	MOREIRA, Antônio Domingos.; SANTOS, Ramofly Bicalho.	Education of the field in times of pandemic in the municipality of Riacho de Santana.	*Roteiro* – Qualis A2.

Source: Developed by the authors (2023).

By way of example, an excerpt from another map is presented below. It contains additional information regarding the article titles, the verbs used in the objectives, and the keywords. Although these elements may appear to be simple information at first glance, their analysis contributed significantly to the interpretation of the data.

Map 2 – Additional information on the selected articles

Related titles	Rural education in times of a **pandemic**: students' perception at the Family Farm School of the South Region (EFASUL) – (A8). Interaction, challenges and paths, in times of **pandemic**, in the context of LEdoC teacher training – (A9). Education of the field in times of **pandemic** in the municipality of Riacho de Santana – (A10). Basic education in rural schools in the **pandemic** context: remote teaching for whom? **–** (A7).
	The presence of technology in Rural Education: **mapping** of national scientific production of the last five years – (A1).
	Conceptions of students of a school of the countryside on **technology** – (A2). Processes of inclusion and Rural Education: challenges of basic education in the context of new **technologies** – (A5). University, literacies and new **technologies** in rural education contexts – (A6). Democratization and use of digital **technologies** in rural schools: a case study – (A3). Hoe, pen and mouse: the dialogue between **technologies** in continuing education of field teachers in distance mode – (A4).
Objectives (verbs used)	Analyze (A8; A2; A7); Perform (A1); Show (A9); Search (A5); Present (A10); Verify (A6);

	Investigate (A3); Understand (A4).
Keywords (Quantity)	Rural Education (8); Technology (2); Remote Teaching (2); EFASUL (1); New Coronavirus Pandemic (1); Students' Perception (1); Mapping (1); Scientific Production (1); Interactional Sociolinguistics (1); Academic and Teacher Literacy (1); Interaction (1); Portuguese Language Syntax (1); Digital Information and Communication Technologies (1); Rural School (1); Inclusive Education (1); Education for Diversity (1); Access to Technology (1); Information and Communication Technologies (ICTs) (1); COVID-19 (1); Educational Technologies (1); Teacher Training (1); Public Policies (1); University (1); Literacies (1); Academic Literacies (1); Digital Literacies (1); Rural Schools (1); Teaching and Learning (1); Basic School (1); Digital Exclusion (1); Digital Inclusion (1); Continuing Education (1); Distance Learning (1).

Source: Developed by the authors (2023).

The analysis of Map 2 made it possible to identify that the article titles recurrently highlight themes related to Rural Education in the context of the pandemic, emphasizing aspects such as students' perceptions and the impacts of technology use in rural schools. Regarding the verbs employed in the objectives, there is a predominance of terms such as "investigate", "analyze", and "verify," which converge toward the idea of conducting systematic analyses. On the other hand, verbs such as "carry out", "demonstrate", and "present" indicate approaches focused on practical application. In addition, the verbs "understand" and "seek", although distinct, point to investigations oriented, respectively, toward comprehension and exploration of the object of study.

With regard to the keywords, the recurrence of the term "Rural Education" stands out, which highlights its centrality in the analyzed studies. The terms "Technology" and "Remote Teaching" reflect the significant presence of discussions on technological innovations, especially within the educational context shaped by the pandemic.

In light of the presentation and analysis of the maps, the following section proceeds to the presentation of the final findings resulting from the theoretical mapping conducted.

4. Results and Discussion

The presentation of the results begins by emphasizing that, during the analysis of the articles selected for the construction of the seven maps, as these instruments were filled in, the understanding of the investigated theme became clearer and more refined. In this context, the term "refined" refers to the gain in clarity and depth achieved by the researcher throughout the mapping process in relation to the object of study.

This understanding is consistent with the approach proposed by Biembengut (2008), since Theoretical Mapping is not limited to the mere compilation of existing studies nor to their organization in a linear historical sequence. On the contrary, it seeks to identify relevant and meaningful points that can serve as a guide for understanding the segments already investigated and expressed in the academic literature, which enables the construction of a system of interpretation and explication. This more in-depth understanding was made possible through the systematic completion of the seven maps.

After this brief contextualization, the presentation turns to the findings resulting from the mapping process regarding the scenario of digital technology integration in rural schools.

4.1 Identification I: Objectives

First, it is emphasized that the decision to begin the analysis with the categorization of the articles' objectives is grounded in the understanding that, according to Richardson (2012, p. 62), objectives represent the stage in which researchers "define, in general terms, what they intend to achieve by conducting the research". Aware of the importance and clarity required at this stage for understanding the focus of each article, a map organized in a table

format was developed in order to highlight the similarities among the objectives of the analyzed articles. The map itself constituted a methodological resource that made it possible to visualize these convergences.

Based on this procedure, the objectives were grouped according to their similarities. It resulted in the organization of four distinct groups. The first group focuses on the implications of the COVID-19 pandemic for Rural Education and is represented by studies A8, A7, and A10. These studies share a concern with understanding the effects of the pandemic, ranging from the organization of educational activities during the 2020 academic year, as presented in A8, to the impacts of remote teaching in rural basic education schools, which highlight processes of educational exclusion in access to digital technologies, as discussed in A7. Study A10, in turn, proposes reflections on the challenges of organizing teaching work in times of pandemic, and emphasizes aspects related to public policies within the context of the transformations imposed by the new educational format.

It is observed that rural basic education schools already face challenges related to their physical and structural conditions, which contribute to the increasing closure of these institutions and to the implementation of school consolidation processes, resulting in overcrowded classrooms and the provision of multigrade classes (Silva; Cunha; Santos, 2021). But how does this relate to the pandemic context? The connection is clear. Considering that these schools already deal with difficulties, which include the lack of school transportation and limitations in the training of teachers who work in them, as highlighted by the authors, the transition to remote teaching during the pandemic intensified these problems, which compromised the right to dignified education for rural populations.

Associated with these circumstances is the inequality in access to digital technologies between rural and urban populations. While urban areas tend to have greater availability of connectivity and technological resources, rural communities often face obstacles that hinder their participation in the contemporary digital context. The lack of adequate infrastructure contributes to the widening of the so-called "digital divide", compromising both technological integration and equitable participation in educational processes mediated by technology.

In this sense, the need for public policies is reinforced — policies that not only expand access to technologies in rural areas but also effectively promote digital inclusion, including the training of teachers and students in rural schools so that they can benefit from the digital era (Mota *et al.*, 2022). Moreover, such measures should contribute to reducing the social inequalities exacerbated by the COVID-19 pandemic.

The second group of objectives concerns the perception and relationship of rural students with digital technologies. Studies A2, A6, A3, and A4 address students' understanding of technology in the educational context. A2 analyzes the conceptions of students at a rural school regarding the relationship between technology and the countryside, and investigates issues related to access and use of these tools. Study A6 seeks to understand how students in a distance-learning specialization course in Rural Education access the materials provided and participate in activities through the Moodle platform. Meanwhile, A3 investigates the interaction of students in rural schools with digital technologies within the school environment, bringing educational practices closer to the rural context.

These studies focused on the students' perspectives and on how technologies are integrated into their educational environments. For example, study A2 shows that students associate technological equipment with practicality, ease, and speed in the rural context, which illustrates that technology "is considered an ally in rural life and, unlike in urban areas, is present in small changes that facilitate their daily tasks" (Bierhalz; Fonseca; Oliva, 2019, p. 18-19).

Thus, the authors emphasize that the use of technologies in rural schools must be conceived differently from that adopted in urban schools, taking into account their practical functionality and their connection to rural ways of life. These conclusions underline the importance of understanding the perceptions of rural students in order to adapt educational and technological practices to the specificities of these communities.

The third group consists of studies A1 and A5, which focus on the analysis of scientific production regarding Technology and Rural Education. A1 conducts a mapping of national scientific publications on this topic, while A5 aims to present research that contributes to the strengthening of Rural Education.

Finally, the fourth group is represented exclusively by study A9, which analyzes the perceptions of both students and teachers during online classes in a rural educator training course. The study highlights the interactions established between instructors and students in a Rural Education undergraduate course within the pandemic context.

4.2 Identification II: Theoretical Framework

The analysis of the theoretical framework of the articles revealed the recurrence of concepts related to Alternating Pedagogy (AP), the identity of rural schools, Rural Education, and Technology. Nosella (2012, p. 29-30) was one of the authors used to support the concept of AP, defined as "[...] a way of organizing the teaching-learning process by alternating between two distinct spaces: the family farm and the school. Therefore, it is connected, both in its origin and development, to education in rural settings".

This definition emphasizes the uniqueness of AP in integrating the family farm as an educational space, which recognizes the importance of connecting knowledge derived from rural work with that systematized in the school environment. Another recurring concept concerns the "identity of the rural school," which is defined:

> [...] through its connection to issues inherent to its reality, grounding itself in the temporality and knowledge specific to the students, in the collective memory that signals futures, in the network of science and technology available in society, and in social movements advocating for projects that link the solutions required by these issues to the social quality of collective life in the country (Brazil, 2002, p. 01).

This conception reinforces the need for rural schools to be connected to the local reality, integrating scientific knowledge and traditional know-how, as well as pedagogical practices that value the culture and history of peasant communities.

There is also a significant presence of the concept of "Rural Education", supported by theoretical frameworks, with emphasis on authors such as Arroyo; Caldart; Molina (2004) and Caldart (2009; 2011; 2012).

For Arroyo, Caldart, and Molina (2004), Rural Education is not limited to the rural context; it transcends the traditional view of the "countryside" as merely "rural". This concept emerges from a perspective that redefines the role of the countryside in development, democratization, and inclusion projects. By highlighting rural inhabitants as protagonists in this narrative, the authors contribute to a participatory understanding of social actors in the peasant educational context. Aligned with this perspective, Caldart (2012) frames Rural Education as the result of social struggles by rural workers for access to education.

Regarding the concept of "technology", the contribution of Kenski (2015) stands out. The author understands technology as "power" that goes beyond common sense and encompasses a set of human creations, their uses, and applications throughout history.

Considering recent technological advances, one human creation that has seen widespread use is ChatGPT, a generative Artificial Intelligence (AI) developed by OpenAI (Quintans-Júnior *et al.*, 2023). Characterized by speed and immediacy, this technology represents a significant advancement in human-machine interactions. As noted by Guimarães (2002, p. 14):

> Each time technology improves, the use of tools becomes easier and more efficient, saving time and effort, since we no longer need to reinvent the wheel: we can directly apply the latest knowledge and appropriate its use. What may have taken years to discover can, once in use in society, be utilized in just a few minutes.

This constant evolution of technologies connects to what was discussed in the introduction, since human beings, as social beings, are naturally inclined to think about improvements for the community within their context. Hence, Rural Education must be structured to ensure that rural inhabitants are not excluded from technological and social advances, guaranteeing them the full exercise of their rights.

4.3 Identification III: Results

With regard to the results presented in the articles, some relevant aspects can be noted. Study A2 shows that the majority of students at the investigated rural school use the internet, predominantly through mobile devices, which challenges the generalizing and reductionist view that individuals living in rural areas are completely "disconnected" from contemporary society.

This finding reveals the heterogeneity of rural realities and indicates that, although many communities face connectivity challenges, generalizing the absence of internet access across all rural areas is a mistake that can reinforce stereotypes. Nevertheless, it is necessary to consider contexts such as that presented in study A6, in which the community had to mobilize collectively to acquire a rural antenna for internet access.

Study A3 identifies the lack of connectivity as one of the main barriers to the democratization of digital technologies in rural schools and notes that some students prefer traditional teaching due to their limited familiarity with technological tools. A similar situation is presented in study A4, which emphasizes the difficulties related to some students' low proficiency in using these technologies.

Studies A7, A8, and A10 underscore the urgency of public policies aimed at teacher training, expanding internet access in rural communities, and providing technological equipment to students in socioeconomically vulnerable situations, as a way to reduce inequalities in access to quality public education.

Within the scope of the mapping studies, studies A1 and A5 reveal the scarcity of scientific publications focused on the theme of technologies in Rural Education, which indicates the need for further research in this area. Finally, study A9 presents reflections on teacher training in the Rural Education undergraduate program, emphasizing the use of WhatsApp as a strategy for interaction between teachers and students during the pandemic, which highlights teachers' ability to adapt to the challenges imposed by the pandemic context.

5. Final considerations

Based on the proposed objective, which consisted of conducting a theoretical mapping of the use of digital technologies in rural schools, it was possible to show that the analyzed academic production presents a scenario marked by specific advances, yet crossed by persistent structural challenges. The results of the mapping indicate that the integration of technologies in Rural Education occurs unevenly and is strongly influenced by factors such as access to connectivity, available technological infrastructure, and the training of the individuals involved in the educational process.

A recurring aspect in the analyzed studies concerns the impacts of the COVID-19 pandemic, which not only exposed but also deepened historically rooted inequalities in rural schools. The adoption of Emergency Remote Teaching (ERT) revealed significant limitations related to the lack of quality internet, the scarcity of technological equipment, and students' difficulties in accessing digital platforms, which compromised the right to education in an equitable manner. Nevertheless, the analyzed studies also reveal collective efforts led by peasant communities and teachers, who sought alternatives to ensure the continuity of educational activities and demonstrated their capacity to adapt to the challenges imposed by the pandemic.

Another relevant finding concerns rural students' perceptions of digital technologies: these individuals are not disconnected from technological advances. It challenges generalizations that associate the countryside with complete digital exclusion. However, the use of technologies, both in the school environment and in daily life, presents limitations that underscore the need for contextualized pedagogical approaches, capable of recognizing the practical functionality of technologies in rural settings and engaging with the sociocultural specificities of these territories.

The mapping also revealed weaknesses related to teacher training for the pedagogical use of digital technologies in Rural Education. The absence of consistent public policies aimed at teacher development emerges as a limiting factor for the critical and meaningful integration of these technologies into the educational process, which restricts their formative and

emancipatory potential. Furthermore, the results point to a scarcity of scholarly productions that more deeply connect technology and Rural Education, indicating gaps that demand greater investment in research in this area.

Therefore, the methodological approach adopted in this article proved fundamental for deepening the analyses conducted. The Theoretical Mapping allowed for a more thorough examination of the identified studies. It provided a systematic framework that enabled not only the description of the research but also the identification of similarities, thematic recurrences, and the directions taken by the analyzed studies, which contributed to a more consistent understanding of the topic.

In the current context, where technology evolves incessantly, it is essential for society as a whole to stay updated and keep pace with these transformations, addressing the challenges arising from accelerated development, which, worryingly, has contributed to the deepening of social inequalities. In this regard, the need for public policies that go beyond the mere provision of equipment is emphasized. These policies should include access to quality internet, continuous teacher training, and the recognition of the countryside as a legitimate space for knowledge production.

These actions are essential to ensure that peasant communities keep pace with technological innovations and can use these tools as resources to improve community life, whether in education, agricultural work, or other practices that collectively contribute positively to social development.

From this perspective, there is the potential for significant transformation in the educational landscape of rural schools through an education that promotes the reconfiguration of traditional methods and presents itself as disruptive, by taking into account the specificities of these territories and the advances of contemporary society. This approach aims not only to expand access to knowledge but also to strengthen the development of rural inhabitants, equipping them to face contemporary challenges and contribute critically and sustainably to the development of their communities.

Finally, this study is expected to contribute to the deepening of discussions on digital technologies in Rural Education by highlighting the limitations, possibilities, and gaps present in recent academic production, as well as by supporting new research and fostering critical reflections committed to social justice, digital inclusion, and the guarantee of the right to quality public education for rural communities.

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