ENGLISH LANGUAGE AND DIGITAL TECHNOLOGIES IN PUBLIC ELEMENTARY EDUCATION: A SYSTEMATIC REVIEW

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ABSTRACT

This article presents a systematic review of the literature on the integration of digital technologies in English language teaching in the final years of elementary school. The research is based on bibliographic verification in sources such as the CAPES/MEC Journal portal, Scielo Electronic Library, Scopus Multidisciplinary International Database and Annals of the XII Brazilian Congress of Informatics in Education. Using Boolean search engines, the presence of the theme in Brazilian scientific production was verified. The results show a small number of publications on the teaching of English with digital technologies, highlighting the need for further studies in this area and highlighting a significant gap to be explored in future research.

Keywords: Digital technologies, English Teaching.

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INTRODUCTION

In recent decades, the digital revolution has transformed several sectors of society, including education. The integration of digital technologies in classrooms aims to modernize pedagogical practices and improve the quality of teaching. According to the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2021), digital innovation has the potential to enrich and transform education, accelerating progress towards the Sustainable Development Goals (SDGs), and also points out that:

> "Digital innovation has demonstrated the power to complement, enrich and transform education, accelerating progress towards Sustainable Development Goal 4 (SDG 4) for education and transforming modes of provision of universal access to learning" UNESCO (2021).

In this scenario, the global importance of English language learning is undeniable, being an essential competence in an increasingly interconnected world. Mastery of English facilitates international communication, access to vast fields of knowledge, and ample professional opportunities. This reality has led many countries to implement educational policies that emphasize the importance of English proficiency, reflecting the growing global demand for this skill.

In this context, the integration of Digital Information and Communication Technologies (DICTs) in education emerges as a powerful strategy to meet this demand, offering innovative and effective methods for teaching and learning. The evolution of DICTs has significantly transformed the education sector.

The impact of these technologies is particularly notable in the way traditional teaching methods are being reshaped to incorporate new pedagogical approaches that exploit the potential of DICTs. According to UNESCO (2021):

> "The integration of digital technologies in English language classes is of great social, political and economic relevance. Politically, the education policies of many countries encourage the incorporation of technologies into classrooms to prepare students for a digitally interconnected world" (UNESCO, 2021).

Sabota and Almeida Filho (2017) state that training teachers capable of mediating new digital technologies in the classroom is essential. In addition, Pallu (2016) points out the need for public policies aimed at training English teachers who master digital tools, because, in the author's conception, English language teaching should involve the stimulation of critical thinking, and there is no way to ignore technology for the resignification of this teaching.

However, in the context of public elementary education, the use of DICTs faces specific challenges. Public schools often deal with resource limitations, including a lack of adequate equipment and the need for ongoing teacher training for the effective use of these technologies. However, DICTs offer promising solutions to these challenges. They can help overcome traditional barriers, such as the scarcity of teaching materials and the difficulty of keeping students engaged. Successful implementation of digital technologies in primary education can improve the quality of education by making learning more accessible and inclusive.

Despite the increasing use of DICTs in education, there are still significant gaps in the literature on their effectiveness and the challenges associated with their implementation. Therefore, there is an urgent need for a systematic review that gathers and analyzes the existing evidence on the use of DICTs in English language learning. This review will not only contribute to a better understanding of effective pedagogical practices but also provide valuable insights for educators and policymakers. The realization of this systematic review is of great relevance to guide future research and educational practices, promoting significant advances in the field of Informatics in Education and in the quality of elementary education.

METHODOLOGICAL PROCEDURES

Thus, a specific theme is presented, where relevant research is analyzed, as well as the selection of data present in different studies. This is a systematic review of the literature based on Kitchenham (2004), which offers guidelines for this type of research. The elements considered are:

i) **Research Questions (QP):** (QP1): What is the theme of the research? (QP2): What is the purpose of using the technologies? (QP3): What technological resources are being used?

ii) **Inclusion Criteria (IC) and Exclusion Criteria (CE):** (CI1): Research that addresses the English Language and DICTs in Elementary School, (CI2): Research that involves formal teaching spaces, (CI3): Research that involves technological resources, (CE1): Complete works, (CE2): Duplicate research, where the oldest version is disregarded.

iii) **Search Strategies (EB**): (EB1): Definition of databases, (EB2): Definition of keywords, (EB3): Refinement of searches from the reading of titles, keywords and abstracts.

RESEARCH QUESTION

To build the systematic review and guide the research, the question was formulated about the use of technologies in the teaching and learning of the English language in the final years of Elementary School. The main question is: **What digital technologies and methods of teaching the English language are being used in the final years of elementary school?**

INCLUSION AND EXCLUSION CRITERIA

In order for the research to be presented according to the intended teaching modality (final years of Elementary School in the discipline of English Language, with a focus on the use of technologies), inclusion and exclusion criteria were used. The application of these criteria ensured that the selected works were related to the research questions [Kitchenham & Charters 2007, p. 19].

SEARCH STRATEGIES

The search strategies were defined to continue the systematic review. The databases chosen were the CAPES journals, the Scielo Digital Library, the Scopus Multidisciplinary International Data Base, and the annals of the Brazilian Congress of Informatics in Education (CBIE). The keywords defined were: "digital technologies" AND "English language", considering the time interval of the last 5 years, starting in 2019, standardized through these *Boolean search engines* in order to bring results consistent with this study.

Chart 1 presents the selected studies according to the inclusion and exclusion criteria applied.

Table 1. Selected Surveys

	English Language AND Digital Technologies				
CAPES JOURNAL PORTAL	**101 records**				
	CI1	CI2	CI3	CE1	CE2
	15	47	35	1	3
SCIELO ELECTRONIC LIBRARY	**6 records**				
	CI1	CI2	CI3	CE1	**Third grade**
	1	1	2	0	2
SCOPUS MULTIDISCIPLINARY INTERNATIONAL DATABASE	**1 Record**				
	CI1	CI2	CI3	CE1	**Third grade**
	1	0	0	0	0
CBIE	**0 records**				
	CI1	CI2	CI3	CE1	CE2
	0	0	0	0	0

RESULTS AND DISCUSSION

The significant presence of academic works on teacher training and the use of specific technological tools in the area of English Language (82 works) can be attributed to several fundamental reasons. First, teacher training is a crucial pillar in education, as teachers are responsible for implementing and adapting new methodologies and technologies in the teaching-learning process. Training teachers in digital technologies is essential to ensure that they can effectively integrate these tools into their pedagogical practices, promoting more interactive and meaningful learning for students. As such, many studies focus on how to prepare teachers to meet the challenges of the 21st century, where digital competence has become an indispensable skill. In addition, research in teacher education often involves the evaluation of professional development programs, the effectiveness of specific tools, and the adaptation of curricula to incorporate emerging technologies, topics that naturally attract academic attention due to their direct relevance in improving the quality of teaching. As pointed out by Sabota and Almeida Filho (2017), the training of teachers trained in digital technologies is a priority in the area.

Another factor that contributes to the abundance of research in this area is the growing interest in specific technological tools and their applications in English language teaching. Technologies such as language learning software, augmented reality applications, online teaching platforms, and other digital tools offer new opportunities to personalize and improve the learning experience. Researchers are interested in exploring and validating the effectiveness of these technologies in various educational contexts. The focus on specific tools allows for a detailed analysis of how each technology can be optimized to maximize

student learning, leading to a proliferation of studies examining the usability, effectiveness, and impact of these tools on teacher education. In addition, the rapid technological evolution provides a constant flow of new tools for investigation, encouraging the continuous production of research aimed at these innovations. Examples include using Duolingo for language learning and apps like Mondly that integrate augmented reality.

On the other hand, the relatively smaller number of works focused on the integration of digital technologies in English language teaching in the final years of Elementary School (15 works) may be the result of several challenges and limitations. First, primary education is a vast and diverse field, where research often needs to address a broader range of contextual factors, such as variations in school infrastructures, differences in access to technology, and heterogeneity in students' abilities and needs. The complexity of conducting comprehensive and representative research at this educational level can discourage specific studies, leading to lower academic output. In addition, technological interventions in primary education often require the cooperation and support of multiple stakeholders, including school administrators, parents, and communities, which can make the implementation and evaluation of research projects more challenging.

Another aspect that may contribute to the scarcity of studies in this area is the historical trend of prioritizing research at more advanced levels of education, where technologies can be implemented in a more sophisticated way and where the impacts are more easily measurable. Elementary education, by its nature, often demands more basic and adaptive pedagogical approaches, which can result in less research focused on advanced technological innovations. In addition, the development of technological and digital skills in younger students can be seen as less urgent compared to preparing high school and higher education students for an increasingly digitized job market. Consequently, research priorities tend to align more closely with levels of education where the immediate and direct impact of digital technologies can be more clearly observed and measured, resulting in a lower emphasis on the use of digital technologies in primary English language education.

The critical analysis of the articles listed reveals a significant diversity in the approaches and objectives of using digital technologies in the teaching of English, reflecting the different perspectives and educational contexts addressed by the authors. Lima and Fernandes (2019) focus on the creation of didactic material using *YouTube* and *Netflix* videos for conversation classes, highlighting how these resources can streamline classes

and engage students through popular and accessible audiovisual content. This practical and contemporary approach facilitates the connection between theory and practice, providing students with a more engaging and contextualized learning experience.

Caruzzo et al. (2021) explore the development of a multimedia application for the acquisition of English vocabulary in childhood, emphasizing the importance of interactive and multimodal tools in language learning. The use of an educational app meets the need for resources that can be easily integrated into children's daily lives, promoting learning in a playful and effective way. This study highlights the relevance of adapting technologies to the target audience, creating specific solutions that consider the characteristics and needs of younger learners.

Pisetta et al. (2020) address the uses of digital technologies in literacy practices with high school students, proposing that the integration of these technologies can enrich pedagogical practices and foster essential skills for the twenty-first century. The focus on improving digital literacy practices is a reflection of the growing need to prepare students for an increasingly digitized world. Borges et al. (2023), in turn, discuss the implementation of active methodologies and digital technologies in high school, pointing out that these approaches can increase student engagement and participation, in addition to promoting more meaningful and collaborative learning.

Schweikart (2020) and Rio and Nicolaides (2019) discuss teacher training and the use of digital technologies in English teaching, focusing on training educators to use these tools effectively. Schweikart emphasizes the importance of initial and continuing education, while Rio and Nicolaides highlight the improvement of students' oral competence through the use of digital technologies. These studies highlight the need to train teachers who not only know, but also know how to apply these technologies in a pedagogical way, ensuring that students fully benefit from the technological innovations available.

Gandin and Porto (2020) and Silva (2022) explore the use of educational apps and digital genres in English teaching, with Gandin and Porto highlighting teacher training through educational apps and Silva proposing the use of Tik Tok for English learning. Both studies highlight the potential of apps and digital platforms to make language learning more interactive and engaging. Adapting popular tools like Tik Tok for educational purposes demonstrates an innovative and contemporary approach, which can attract and maintain students' interest effectively.

Ferreira and Ribeiro (2023) and Lima and Zavam (2021) discuss the teaching and learning of English vocabulary through digital technologies, with Ferreira and Ribeiro exploring hypermodality and Lima and Zavam comparing face-to-face and distance modalities. Ferreira and Ribeiro highlight the use of holograms and other advanced technologies to enrich the learning experience, while Lima and Zavam offer a comparative view that helps to understand the advantages and challenges of each teaching modality. Both studies contribute to the understanding of how different technologies can be applied to improve the effectiveness of English language teaching.

In summary, the articles analyzed show that the integration of digital technologies in English teaching is a consolidated trend, with several approaches and objectives. From creating courseware and educational apps to implementing active methodologies and using popular platforms, the authors demonstrate that technologies can significantly enrich the learning experience. However, it is crucial that teachers are adequately trained to utilize these tools effectively, ensuring that students fully benefit from the opportunities offered by the digital age. Below is a summary table of the main works analyzed on this platform.

Table 1. Searched articles

Author(s)	Research Theme	Purpose of Use of Technology	Technological Resources Used
Gyzely Suely Lima, Priscilla Mendes Fernandes	Creation of teaching materials for English language	Using YouTube and Netflix videos in conversation classes	YouTube, Netflix
Vivian Nádia Ribeiro de Moraes Caruzzo et al.	Acquisition of English vocabulary in childhood	Multimedia Application Development	Multimedia app
Cleide Beatriz Tambosi Pisetta et al.	Uses of digital technologies in literacy practices with English in high school	Improving digital literacy practices	Educational applications, distance learning platforms, multimedia tools.
Rosimeire Aparecida Soares Borges et al.	Active methodologies and digital technologies in the study of the English language	Implementation of active methodologies in high school	Educational applications, distance learning platforms, multimedia tools.
Juliana Freitag Schweikart	Teacher training and the use of digital technologies in teaching English to children	Training teachers for the use of digital technologies	Educational applications, distance learning platforms, multimedia tools.
Marlon Machado Oliveira Rio, Christine Siqueira Nicolaides	Development of English Orality in Public School	Improvement of students' oral competence	Educational applications, distance learning platforms, multimedia tools.
Hellen Boton Gandin, Ana Paula Teixeira Porto	Use of educational apps in English teacher training	Teacher training using educational apps	Educational apps
Fabione Gomes da Silva	Digital Genres and English Teaching	Learning by design using Tik Tok	Tik Tok

Maria Cristina Ferreira, Patrícia Lisbôa Izetti Ribeiro	Teaching and learning English vocabulary mediated by digital technologies	Use of hypermodality for learning	Digital technologies, hologram
Fábio Rodrigo Bezerra de Lima, Áurea Suely Zavam	Teaching English by graduates in distance and face-to-face modalities	Comparison of face-to-face and distance learning modalities	Educational applications, distance learning platforms, multimedia tools.
Viviane Cabral Bengezen	Digital technologies and inclusion in English teaching in public schools	Digital inclusion and faculty and student authorship	Educational applications, distance learning platforms, multimedia tools.
Cíntia Regina Lacerda Rabello	Virtual exchange and English language learning	Improving learning through virtual exchange	Digital technologies, virtual exchange
Patrícia Vasconcelos Almeida, Helena Maria Ferreira	Language teacher training and digital practices	Development of digital pedagogical practices	Educational applications, distance learning platforms, multimedia tools.
Cátia Veneziano Pitombeira, Ana Karina de Oliveira Nascimento	Digital technologies in PIBID in times of pandemic	Adapting pedagogical practices during the pandemic	Educational applications, distance learning platforms, multimedia tools.
Cíntia Regina Lacerda Rabello	Technology-mediated language learning and teacher training	Training of teachers and students through technologies	Educational applications, distance learning platforms, multimedia tools.

In the Scielo database, a critical analysis of the eleven articles was carried out, revealing a significant diversity of approaches and contributions on the theme of education and technology, focusing on different aspects and contexts.

In the article by Reinildes Dias and Sônia Maria de Oliveira Pimenta (2015), published in the *Brazilian Journal of Applied Linguistics*, the authors explore the integration of technologies in the training of English teachers, highlighting the improvement in oral communication skills through innovative pedagogical practices that use digital tools and blended learning. The research highlights the importance of blended learning, which combines face-to-face and remote teaching practices. and the use of tools such as Moodle for the development of advanced oral skills, suggesting that these practices can be effectively transferred to teaching in the future classroom [Dias and Pimenta 2015, p. 711].

Cíntia Rabello Arcorseuil, in her article, addresses the impact of virtual communities on the continuous training of teachers. The author emphasizes that active participation and a sense of belonging in a virtual community are fundamental for professional development, pointing out the relevance of these communities in continuing education and adaptation to new technological requirements [Rabello 2021, p. 15].

Nukácia Meyre Silva Araújo focuses her analysis on the use of blogs as a tool to support the development of pedagogical skills. Araújo argues that blogs provide a space for critical reflection and sharing of educational practices, promoting a more collaborative and interactive education. The author highlights the importance of self-reflection and peer feedback as central elements for the professional development of educators [Araújo 2021, p. 29].

In the article on uncollections and remixes, the author addresses the remix culture in education, highlighting the relevance of the creative reuse of digital content for the development of new skills and knowledge. The research explores how the practice of remixing can be integrated into the school curriculum to foster innovation and critical thinking among students, emphasizing the importance of intellectual property and copyright in the digital educational environment [Descollections and remixes 2016, p. 40].

Lucas Moreira dos Anjos-Santos analyzes the effectiveness of digital tools in teaching English, emphasizing the importance of digital literacy for teacher training. The author discusses how the integration of technologies can promote more meaningful and contextualized learning, arguing that digital competence is essential for the professional success of educators in the twenty-first century [Anjos-Santos 2015, p. 52].

Miguel's analysis focuses on the continuous training of teachers through virtual communities, highlighting that active participation and a sense of belonging are essential for the success of distance learning programs. The study suggests that these virtual communities can be an effective alternative for continuous professional development, providing a collaborative and dynamic learning environment [Santos 2013, p. 63]. (Miguel, 2013).

Cordeiro investigates the interaction of teachers in educational chats, concluding that the lack of familiarity with the genre and the appropriate interactional frameworks can compromise the effectiveness of these interactions. The author suggests that teacher training should include familiarization with different genres of digital communication to improve the quality of interactions in virtual environments [Cordeiro 2020, p. 75].

Souza's study examines the appropriation of technological resources by teachers in a digital literacy course, showing that technological training can empower educators to effectively use digital tools in their pedagogical practices. The research highlights the importance of continuous and contextualized training for professional development [Souza and Ribeiro 2023, p. 88].

Queiroz explores the perception of teachers in training about continuing education in the virtual environment, concluding that online courses can offer solid and effective training, as long as they are well structured and promote interaction between participants. The author emphasizes the need to adapt educational paradigms to new technologies and the demands of contemporary society [Aureliano and Queiroz 2023, p. 102].

Finally, Santos' article addresses the experience of students in distance learning courses, discussing the multiple perspectives of the participants and the learning strategies adopted. The author concludes that distance education can be an effective modality for education, as long as the specific needs and characteristics of students are considered, promoting a flexible and accessible learning environment [Santos 2013, p. 115].

These studies highlight the importance of integrating digital technologies in teacher training and practice, emphasizing that familiarity and effective use of these tools are crucial for contemporary education. Approaches vary, but all agree that technology offers significant opportunities for pedagogical innovation, collaboration between teachers and students, and adaptation to the new educational demands of the digital society. Here is the table of the articles with the categories analyzed:

Table 2. Category analysis

Author(s)	Research Theme	Purpose of Use of Technology	Technological Resources Used
Reinildes Dias and Sônia Maria de Oliveira Pimenta	Integration of technologies in English teacher training	Improve oral communication skills	Moodle, web tools
Cíntia Rabello Arcorseuil	Impact of virtual communities on the continuous training of teachers	Continuous professional development	Virtual communities
Nukácia Meyre Silva Araújo	Use of blogs as a tool to support the development of pedagogical skills	Promotion of critical reflection and sharing of practices	Blogs
Decollections and remixes	Remix culture in education	Development of new skills and knowledge	Remix Tools
Lucas Moreira dos Anjos-Santos	Effectiveness of digital tools in English teaching	Promoting meaningful and contextualized learning	Various digital tools
Saints	Continuous teacher training through virtual communities	Collaborative professional development	Virtual communities
Lamb	Teacher interaction in educational chats	Improve the quality of educational interactions	Educational chats
Souza	Appropriation of technological resources by teachers in a digital literacy course	Empowering educators to use digital tools effectively	Digital literacy tools
Aureliano	Perception of teachers in training about continuing education in the virtual environment	Provide solid and effective training	Online courses

Saints	Experience of students in distance learning courses	Provide a flexible and accessible learning environment	EAD Platforms

From the analyses made, we can corroborate with *Ertmer & Ottenbreit-Leftwich*, (2010) when they state that: "Teachers face significant barriers in the integration of digital technologies, including the lack of specific and continuous training, inadequate technological infrastructure and resistance to change", that is, much is said about training, but without real conditions for the pedagogical use of digital technologies.

Also, according to Blake (2013): "The use of digital technologies can increase student engagement, promote collaboration and facilitate the development of language skills in a more interactive and dynamic way". However, there is an epistemic diversity in academia itself... what would we say about pedagogical practices beyond the walls of universities.

FINAL CONSIDERATIONS AND FUTURE WORK

The analysis of challenges, such as the lack of adequate training and technological infrastructure, as well as potentialities, such as increased student engagement, can provide us with *valuable insights* to improve pedagogical practices and promote quality education. The social, economic and academic relevance of this study is undeniable, contributing to the development of more effective pedagogical strategies and to the formation of citizens who are more prepared for the challenges of the twenty-first century.

The few Brazilian studies that address the relevance of the English language for elementary education in Brazil highlight the need to foster public policies for the implementation of effective actions in teacher training. These actions should focus especially on the domain of digital technologies, but always considering teachers with training in the area of languages. The analysis of the results highlights the urgent need for policies that promote continuous training and technological support for teachers, in line with the demands of contemporary education.

It is important to emphasize that this research will focus on the analysis of elementary school teachers, aiming to understand that other actors in the educational process should be studied in the future.

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