


THE USE OF DIGITAL RESOURCES TO ENHANCE LITERACY <https://doi.org/10.56238/sevened2024.037-004>**Walaci Magnago¹ and Paula de Castro Nunes²****ABSTRACT**

This article investigated the impact of new digital technologies on the literacy process of students with learning difficulties, with the central problem related to the insufficiency of implementation of these technologies and the inequality of access in schools. The overall objective was to analyze the transformative role of digital tools in the educational context, assessing both the challenges and the opportunities they bring. For this, a mixed method was used, involving bibliographic research and analysis of data collected in the field, with graphs that illustrate teachers' perceptions about the effectiveness of digital technologies in literacy. The most relevant results indicate that, although most teachers recognize the increase in student engagement and motivation with the use of technologies, obstacles remain related to the lack of infrastructure and adequate teacher training, although digital technologies offer significant potential to improve literacy and personalize teaching, their full impact will only be achieved with consistent investments and coordinated actions between schools, governments and society. The contribution of the research lies in the proposal of solutions for a more inclusive teaching, adapted to the individual needs of students, especially those who face greater barriers in the learning process.

Keywords: Literacy. Digital technologies. Learning disabilities. Digital inclusion. Education.

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INTRODUCTION

Literacy represents a crucial and fundamental stage in educational development, as it supports all other learning skills, expanding the capacity for exploration and integration into the world of knowledge. However, it is alarming that many children advance in their school path without a solid literacy foundation, which compromises both learning and personal and social development. Val (2006) defines literacy as the process by which the student appropriates the writing system, mastering the alphabetic and orthographic principles, essential for autonomous reading and writing. In other words, it is a domain of conventions and relations between the sound pattern of speech and written symbols, constituting a fundamental competence for full school and social development.

This issue transcends the educational aspect, emerging as a theme of social equality, since the acquisition of basic reading and writing skills is vital to provide equal opportunities. According to studies by Costa, Cassimiro and Silva (2021), the early development of literacy can vary enormously, depending on the family and social context; Children in more stimulating environments have significant advantages, while those in unfavorable contexts face obstacles that slow or limit their progress. These imbalances have long-term consequences, as children who do not master this elementary base not only face academic difficulties, but also suffer from low self-esteem and motivation, which weakens their confidence and enjoyment of learning.

Literacy, being one of the most important pillars of early childhood education, faces complex challenges that profoundly affect the school future of students. As Saviani and Galvão (2021) point out, among the main obstacles is the difficulty in adapting teaching methodologies to the particular pace of each student. Often, the educational system does not offer a sufficiently flexible environment to meet these specific needs, which causes serious gaps in the formation of written competence.

Other critical factors include the absence of adequate teaching materials, outdated and non-inclusive teaching methods, in addition to the lack of continuing education of educators, as discussed by Soares (2020) and Lima and Freitas (2020). The distance between pedagogical theory and its practice directly compromises the effectiveness of the teaching of reading and writing, evidencing the need for greater convergence between these aspects to ensure a solid and inclusive literacy process.

The lack of support and resources for students with specific learning difficulties is another relevant issue, as Santos and Ferreira (2020) emphasize. Literacy often does not consider the diversity of learning styles and the different needs of each student, resulting in the exclusion of many students who need additional support. Socioeconomic conditions



also intensify these challenges, as children in vulnerable situations often have limited access to reading materials and educational support, which further widens gaps in the development of reading and writing skills.

With the advancement of digital technologies, new possibilities arise to enrich the learning of students with difficulties, as evidenced in the research of Gökbulut and Güneyli (2019) and Azevedo and Amante (2021). Digital tools, such as educational games and simulators, offer interactive and personalized approaches that can be especially effective in developing cognitive and reading skills in students who face challenges in the traditional method. However, the lack of equal access to these resources can generate new educational disparities, creating additional obstacles for students from more vulnerable contexts, which points to the need for strategic and planned implementation.

The most severe consequence of these limitations is the continuous cycle of educational disadvantage. Students who do not develop basic reading and writing skills face persistent challenges in their academic and professional trajectories, limiting their potential for achievement and social participation, as highlighted by Ribeiro (2021) and Silva and Ribeiro (2019). Given this scenario, it is urgent to adopt comprehensive solutions that include adaptive teaching methodologies, continuous teacher training, and equitable access to technological resources. In this sense, this research aims to investigate effective digital technologies to support students with difficulties in the literacy process, with the aim of identifying tools that really promote the development of these essential skills.

Based on the results, it is expected that this investigation will contribute to a deeper understanding of Content Analysis in the qualitative approach in educational research, as well as support the training and development of new researchers. The intention is that these researchers can apply it, recognizing that, in qualitative analysis, the data are not always organized in a structured way, thus requiring a technique that ensures methodological clarity, credibility and scientific rigor.

THEORETICAL FRAMEWORK

Literacy in Brazil has a trajectory marked by deep social and economic inequalities, directly influencing access to basic education for a large part of the population. Since the colonial period, the responsibility for formal education was with the Jesuits, whose mission was indigenous catechesis and the training of local elites. However, this education excluded most of the population, particularly enslaved and indigenous people, who were kept on the margins of the educational process (Saviani, 2017; Soares, 2019).



After the expulsion of the Jesuits in 1759, the educational situation worsened, as control passed to the Portuguese Crown, which did not implement effective policies to expand access to education. With the arrival of the royal family in Brazil in 1808, some educational initiatives were introduced. Even so, they did not have the objective of teaching the masses to read and write, which contributed to the fact that the poorer classes continued to be excluded and illiteracy remained high (Santos; Freitas, 2020).

With independence in 1822, the demand for a literate population that could contribute to the construction of the nation-state arose. The Constitution of 1824 proposed the creation of schools of first letters, but the number of public institutions was insufficient and aimed at the urban elites. As a result, the popular strata continued to have high illiteracy rates, remaining excluded from the educational system (Souza, 2021).

In the First Republic (1889-1930), there were some reforms to expand access to literacy, but exclusion persisted. During the 1930s, the New School movement, led by educators such as Anísio Teixeira, advocated for accessible and democratic education. Despite this, the changes faced resistance from political and economic elites, limiting their impact (Saviani, 2017).

With the arrival of Getúlio Vargas's Estado Novo, there was an increase in the control and standardization of the school curriculum, but advances in literacy were still limited. The government prioritized industrialization and political control, and education remained a tool of social control, resulting in the maintenance of high illiteracy rates, especially in rural areas (Ferreira, 2019).

In the 1960s, Paulo Freire proposed an innovative methodology, centered on awareness and critical education. He argued that literacy should allow a critical understanding of reality. However, the military coup of 1964 interrupted this advance and adopted technicist programs, such as MOBRAL, which prioritized the training of labor, neglecting the critical aspect defended by Freire (Silva; Freitas, 2019).

With the redemocratization and the 1988 Constitution, education was recognized as a universal right. From this framework, programs such as PNAC and Literate Brazil emerged to ensure children's literacy in the early school years, focusing on eradicating illiteracy in Brazil (Souza; Freitas, 2021).

In addition, the 1996 Law of Guidelines and Bases of National Education (LDB) strengthened the right to quality basic education and guided Brazilian educational policies, establishing literacy goals with the National Common Curriculum Base (BNCC) in 2017. However, inadequate teacher training and limited infrastructure in schools make it difficult to implement these guidelines (Soares; Ferreira, 2019).



In recent decades, the introduction of digital technologies in literacy has opened up new perspectives. Tools such as apps and online platforms can assist in the development of reading and writing skills, especially for students with difficulties. However, the inequality of access to these technologies, especially in rural regions, limits their impact (Santos; Lima, 2021).

This context has driven digital inclusion policies to ensure that students from all social conditions have access to the necessary technologies. Silva and Ribeiro (2020) argue that such policies are essential for children in all regions to take advantage of these methodologies.

Even with advances, Brazil still faces high rates of functional illiteracy. Data from the IBGE show that 6.6% of the adult population is still illiterate, highlighting that, although absolute illiteracy has decreased, functional illiteracy remains a significant challenge (Souza; Freitas, 2021).

Thus, the trajectory of literacy in the country reflects structural inequalities and historical challenges. From the colonial period to the present day, access to education and literacy has been conditioned by political, social, and economic issues. However, recent educational reforms and the use of digital technologies indicate a path towards a more inclusive educational system (Silva; Freitas, 2019).

Digital technologies offer benefits to the literacy process, such as increased motivation and engagement. Multimodal tools, which combine visual, sound, and textual elements, provide an interactive and accessible approach to literacy, especially for students with learning difficulties (Santos; Lima, 2021).

In addition, the possibility of personalizing teaching is another benefit of technologies. With adaptive software, it is possible to adjust the content to the pace and needs of each student, which facilitates learning and meets individual differences (Soares, 2020).

For the impact of digital technologies on literacy to be positive, it is essential to ensure continuous teacher training and equal access in schools. Without these investments, digital tools will not reach their potential to promote inclusive and equitable literacy.

METHOD

For the preparation of this article, a rigorous methodology was adopted, initiated by an integrative literature review, which enabled a comprehensive and detailed approach to the use of digital technologies to support the literacy of students with learning difficulties.



The research included renowned academic databases, with the aim of compiling both qualitative and quantitative evidence on documented practices and outcomes in the educational field. The analysis was carried out with a mixed approach, incorporating the methods of Content Analysis, as proposed by Bardin (2017), which allowed a detailed exploration of pedagogical practices and evidence of results in the use of digital technologies for teaching and learning.

The choice of this integrative method aims not only to assess the effectiveness of technologies, but also to map the adaptability and accessibility of pedagogical practices in inclusive contexts, offering a solid basis for future analysis and an in-depth foundation for the development of more effective and inclusive educational methodologies.

To complement this integrative literature review, questionnaires were applied to educators who use digital technologies as a pedagogical methodology. These questionnaires allowed us to explore the experiences of teachers, addressing both the benefits and difficulties in using technologies to promote literacy and engage students with learning difficulties. This initial stage of the study aimed to consolidate a robust theoretical basis for the research, from which the objectives and hypotheses could be clearly outlined, ensuring the alignment between the theory and the data collection instruments.

The development of this study followed a well-defined methodological path, with stages inspired by Bardin's (2011) proposal, which includes pre-analysis, exploration of the material and treatment of the results. The first stage involved the submission of the project to Plataforma Brasil for approval by the Research Ethics Committee (CEP), in accordance with the guidelines of Resolution 466/12 of the National Health Council (CNS). This procedure ensured that the study was aligned with ethical principles and respect for participants. Formal consent was also obtained from the school institution and the Municipal Department of Education, along with the signing of the Informed Consent Form (ICF) by the participating teachers, in accordance with the guidelines of Deitos and Aragón (2021) on transparency and respect for the autonomy of those involved.

In the next stage, the exploration of the material was carried out through a systematic literature review, with the aim of identifying relevant studies on the use of digital technologies to support the literacy of students with difficulties. According to De Oliveira Cavalcante et al. (2021), digital technologies expand pedagogical opportunities and offer greater adaptability to the needs of students, promoting inclusive education. This review provided a solid theoretical basis and pointed out gaps in the literature, guiding the study in its objectives and hypothesis and outlining paths for a more specific contribution in the field of education.



The third stage of the study involved fieldwork for data collection, where quantitative questionnaires and qualitative semi-structured interviews were applied, in line with the mixed methodology of Bardin (2011). The sample consisted of 20 literacy teachers, selected based on criteria such as age group (25 to 50 years) and minimum experience of five years in the area. Technological tools, such as Google Forms, were used to apply the questionnaires, making the data collection process more efficient, safe, and agile, as highlighted by Mentone and Fortunato (2019) when dealing with the use of digital technologies in education.

In the analysis stage, both quantitative and qualitative data were organized and interpreted with the help of statistical techniques and Content Analysis, according to Bardin's (2011) principles. This analysis sought to identify recurring patterns and themes in the pedagogical practices of teachers in relation to the use of digital technologies, mapping challenges and opportunities that these tools offer in the educational context. The blended approach allowed for a broad and detailed understanding of the impact of digital technologies on literacy, generating insights into the experience of educators and the effectiveness of these resources in the school environment.

Finally, the treatment stage of the results involved the organization and discussion of the findings, allowing comparison with the existing literature. The results were presented in a systematic way, highlighting the theoretical and practical contributions of the research and proposing pedagogical interventions aimed at overcoming learning difficulties with the support of digital technologies. The study sought to propose strategies that improve the inclusion and educational development of students with literacy difficulties, in line with contemporary demands for digital and inclusive education.

This study, conducted in a careful and structured manner, aimed to provide a comprehensive understanding of the role of digital technologies in the literacy process. The research aims to bring significant contributions to the field of education, both in the theoretical and practical spheres, stimulating reflections and providing tools for teachers to effectively implement digital technologies in their pedagogical practices, especially in serving students with special educational needs.

RESULTS AND DISCUSSION

Data collected from participating teachers revealed that digital technologies play a transformative role in the literacy of students with learning disabilities. Ferreira and Souza (2019) point out that these tools increase engagement and allow for personalization of teaching, adjusting it to the needs of students. However, teachers indicated challenges,



such as inadequate infrastructure and lack of continuous training, which confirms the findings of Santos and Lima (2021) on the difficulties of adopting technologies in the Brazilian educational context.

By analyzing the quantitative and qualitative data, it was observed that the effectiveness of digital tools depends directly on teacher training and technological support in schools. Soares (2000) already warned that the success of literacy depends not only on access to tools, but also on the quality of pedagogical practices. Thus, the study demonstrated that reading apps and educational games are seen as effective, but require policies that ensure adequate training and infrastructure, as discussed by Azevedo and Amante (2021).

The final analysis reinforces that the use of digital technologies can make education more inclusive and personalized, meeting the specific needs of students with learning difficulties, as suggested by Val (2004). However, to achieve this transformation, a joint effort between governments, educational institutions, and society is needed to ensure equitable access to these tools, as highlighted by Ferreira and Souza (2020).

The data point to a significant impact of the use of digital technologies on literacy, especially in students with difficulties. According to Ferreira and Souza (2019), these tools, when well implemented, increase student engagement, making learning more interactive and personalized. In this research, it was found that the use of digital platforms and games facilitated the recognition of letters and phonemes, corroborating the ideas of Azevedo and Amante (2021) about the playful role of educational games.

However, technological limitations are a constant barrier. Silva and Freitas (2019) highlight that unequal access to the internet and the lack of equipment in Brazilian schools hinder the full use of these technologies. This scenario was confirmed by teachers, who report difficulties in applying interactive activities due to the absence of adequate technological resources, evidencing the need for public policies to universalize access.

In addition, the continuing education of teachers was considered essential for the effective use of digital technologies in literacy. Val (2004) emphasizes that teachers need to be prepared to integrate these tools into pedagogical practices. In the present survey, 25% of the participants indicated this need, reinforcing the importance of specific training to maximize the potential of technologies in the development of reading and writing skills.

Each graph analyzed highlighted valuable aspects about the use of digital technologies to support the literacy of students with difficulties. These data go beyond the reproduction of the results, suggesting that the increase in student engagement, promoted



by the use of technologies, transforms the dynamics of the classroom, confirming what Santos and Lima (2021) discuss about the impact of pedagogical innovation.

The increase in motivation is one of the highlights, with 50% of the participants recognizing this benefit. This data is in line with the research of Soares (2019), which highlights how digital technologies make learning more interactive and engaging. However, challenges related to infrastructure and teacher training remain, as evidenced by Silva and Freitas (2021).

On the other hand, the graphs also pointed out limitations in the use of technologies, such as the lack of adequate equipment and the difficulty of handling by students. This indicates that equitable access remains a major challenge.

Ferreira and Souza (2020) state that inequalities in access compromise the development of literacy skills, especially in low-income contexts, reinforcing the need for investments in infrastructure.

The literature highlights the use of educational games and interactive platforms as promising for literacy, a point confirmed by the data in the graphs. Teachers recognize the effectiveness of these resources, with 40% using educational games as support. This practice, in addition to facilitating learning, creates an environment adapted to the needs of students, as suggested by Val (2006) in his defense of the use of diversified approaches.

Another important aspect is the personalization of teaching provided by digital technologies, according to Ribeiro (2021). This practice, which allows students to advance at their own pace, was recognized by 15% of teachers as a benefit. This type of adaptation is essential for students with difficulties, since adaptive technologies adjust the content to individual needs.

Despite the advances observed, some limitations of the research should be considered, such as the analysis in only one school, which restricts the generalization of the results. Boccato (2006) warns about the importance of recognizing methodological limitations, suggesting that larger samples would bring a more comprehensive view of the impact of digital technologies on literacy.

It is crucial to reflect on the implications of these findings for the field of literacy and for future research. The results of this research expand knowledge by showing that, although digital technologies have great potential, there is still a long way to go in terms of access and training, as discussed by Santos and Freitas (2020).

In conclusion, the analysis of the graphs confirms the perceptions discussed in the literature and suggests new ways to improve pedagogical practice in the use of digital technologies. The advances and challenges identified indicate that the proper use of these



tools can promote an inclusive and personalized education, benefiting the literacy of students with difficulties. However, as several authors point out, the future of technologies in education depends on overcoming structural limitations and ensuring that all students can benefit from these innovations.

FINAL CONSIDERATIONS

The study highlights the transformative potential of digital technologies in the literacy process, especially for students with learning difficulties. Digital tools, by enabling a more interactive and personalized approach, have the power to increase engagement and facilitate the acquisition of reading and writing skills, fundamental aspects for the educational and social development of students. Research has shown that, when well implemented, digital technologies can act as effective pedagogical resources, promoting a more inclusive teaching experience adapted to the needs of each student. This result reinforces the importance of investing in the continued training of teachers and in school infrastructure, since equitable access and technical mastery of these tools are essential to maximize their impact on learning.

However, despite significant advances, the study also reveals the structural challenges that still limit the widespread adoption of technologies in the educational environment. The lack of adequate technological infrastructure and inequality of access continue to be barriers, especially in low-income contexts, where the lack of equipment and internet connection compromises the full use of these resources. The inadequate training of teachers for the use of these technologies also emerges as a limiting factor, which points to the urgent need for public policies and specific investments to overcome these obstacles.

The data collected and analyzed indicates that digital technologies not only offer new ways of learning but also promote educational personalization and inclusion. With the possibility of adapting the content to the pace and level of each student, these tools prove to be especially effective in serving students with learning difficulties. This aspect of personalization is a key differentiator, allowing students to advance at their own pace, which is essential for reducing learning gaps and promoting equity in education. However, for this potential to be fully explored, it is necessary that the application of technologies be accompanied by consistent pedagogical planning and institutional support.

The theoretical review and empirical data presented in this research emphasize the relevance of digital technologies as facilitators of inclusive literacy. However, for the use of these technologies to result in an effective pedagogical practice, it is necessary to ensure that all students and teachers have conditions of access and proper use of digital



resources. In this sense, collaboration between government, educational institutions, and society is essential to build a support network that enables the full use of these innovations.

In addition, the study indicates that the adoption of digital technologies in literacy needs to be aligned with innovative pedagogical practices and teacher training, so that they can incorporate these tools critically and consciously into their daily practices. Only with adequate preparation will educators be able to use digital technologies not only as auxiliary tools, but as central elements in the promotion of meaningful and transformative learning.

In summary, this research contributes to the understanding of the potentialities and challenges of digital technologies in supporting the literacy process, highlighting the importance of a strategic and well-planned implementation. By strengthening the theoretical basis and proposing practical solutions, the study offers directions for the improvement of educational policies and for the formation of a more inclusive education adapted to contemporary demands. The continuity of research in this field is essential so that new solutions can be identified and applied, promoting an educational environment that responds to the needs of all students and allows the full development of their skills and potential.



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