ASSISTIVE TECHNOLOGIES: Use of Technological Tools to Facilitate Inclusion

[1]Kennya Lanny Sousa Varella PhD
student in Educational Sciences
Institution: Inter-American Faculty of Social Sciences (FICS), Address:
Calle de la Amistad Casi Rosario, 777, Asunción, Paraguay E-mail:
Kennya.lanny@hotmail.com

[2]Keszia Luzia Colares Lopes
Master's student in Emerging Technologies in Education
Institution: MUST University
Address: SW 10th Street-Deerfield Beach, Florida, United States. E-
mail keszialopes@gmail.com

[3]Zenilda Seixas Vieira
Institution: MUST University
Address: SW 10th Street-Deerfield Beach, Florida, United States.
vieira201376@gmail.com
Email: vieira201376@gmail.com

[4]Jeannette Cleia Lima da Silva Oliveira Master's student in
Emerging Technologies in Education Institution: MUST
University
Address: SW 10th Street-Deerfield Beach, Florida, United States
 Email: jemacleya@gmail.com

[5]Deborah Ribeiro Oliveira Souza
Postgraduate Psychopedagogy Inclusive Special Education
Institution: Regional Faculty of Philosophy, Sciences and Letters
Address: Candeias-Fac. Caculé Bahia
Email: deboradeby116@gmail.com

[6]Bruno Polizello
Master's Degree in Emerging Technologies in Education
Institution: MUST University
Address: SW 10th Street-Deerfield Beach, Florida, United States
 Email: bru.polizello@gmail.com

[7]Juliana Wakimoto de Almeida Polizello Master's student
in Emerging Technologies in Education Institution: MUST
University
Address: SW 10th Street-Deerfield Beach, Florida, United States
 Email: wakimotojuliana@gmail.com

[8]Nubia Pereira Macena Barreto
 Postgraduate in institutional and clinical psychopedagogy
Address: R. São Luiz, 190 - Ibes, Vila Velha - ES, 29120-312 E-mail:
 macena234@gmail.com

[9]Adail Pinho da Rocha
Master in Emerging Technologies in Education
Institution: MUST University
Address: SW 10th Street-Deerfield Beach, Florida, United States

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Email: professoradailrocha@gmail.com
10Eduardo da Silva Costa
Master's Degree in Emerging Technologies in Education
Institution: MUST University
Address: SW 10th Street-Deerfield Beach, Florida, United States. E-
mail eduardodasilvacosta123@gmail.com

11Adilza Raquel Cavalcanti dos Santos
PhD student in Educational Sciences
Institution: Inter-American Faculty of Social Sciences (FICS), Address:
Calle de la Amistad Casi Rosario, 777, Asunción, Paraguay E-mail:
quelcsantos@gmail.com

SUMMARY
School inclusion represents a fundamental challenge in today's education, requiring practices that promote the participation of all students, regardless of their physical, cognitive or sensory limitations. Assistive technologies play a crucial role in this process, offering tools that enable accessibility and autonomy for students with disabilities, allowing them to fully participate in school activities. These technologies range from simple devices, such as magnifying glasses, to advanced solutions, such as *softwares*screen reading, which are essential to ensure effective inclusion. The main objective of this study is to analyze how assistive technologies can facilitate inclusion in the school environment, highlighting their contribution to the learning and participation of students with disabilities. The research seeks to identify the main types of assistive technologies used in the educational context, discuss pedagogical practices that favor their use, and evaluate the challenges faced by schools when implementing them. In addition, it seeks to provide support for teacher training and inclusive educational planning. The implementation of these technologies, however, requires a careful analysis of the needs of each student and the conditions of the school. For assistive tools to fulfill their function of promoting inclusion, a pedagogical commitment to diversity is necessary, integrating such resources into teaching practices in an efficient and ethical manner. Reflecting on the possibilities and limitations of assistive technologies is essential for building a more inclusive and equitable school that respects the uniqueness of each student and promotes the development of all.
Keywords: Assistive technologies. School inclusion. Accessibility. School environment.

ABSTRACT
School inclusion represents a fundamental challenge in current education, requiring practices that promote the participation of all students, regardless of their physical, cognitive or sensory limitations. Assistive technologies play a crucial role in this process, offering tools that enable accessibility and autonomy for students with disabilities, allowing them to fully participate in school activities. These technologies range from simple devices, such as magnifying glasses, to advanced solutions, such as screen reading software, and are essential to ensure effective inclusion. The main objective of this study is to analyze how assistive technologies can facilitate inclusion in the school environment, highlighting their contribution to the learning and participation of students with disabilities. The research seeks to identify the main types of assistive technologies used in the educational context, discuss pedagogical practices that favor their use and evaluate the challenges faced by schools when implementing them. In addition, it seeks to provide support for teacher training and inclusive educational planning. The implementation of these technologies, however, requires a careful analysis of the needs of each student and the conditions of the school. For assistive tools to fulfill their role of promoting inclusion, a pedagogical commitment to diversity is necessary, integrating such resources into teaching practices in an efficient and ethical manner. Reflecting on the possibilities and limitations of assistive technologies is essential for building a more inclusive and equitable school, which respects the uniqueness of each student and promotes the development of all.
Keywords:*Assistive technologies. School inclusion. Accessibility. School environment.*

INTRODUCTION

School inclusion is one of the great challenges faced by contemporary education, requiring

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actions that promote access, retention and success for all students, regardless of their physical, cognitive or sensory conditions. In this context, assistive technologies emerge as fundamental tools to ensure that students with disabilities can fully participate in school activities and reach their maximum potential. How can assistive technologies transform pedagogical processes and facilitate the effective inclusion of students with disabilities in educational environments? This guiding question guides the present investigation on the impact of technological tools on inclusive education.

The use of assistive technologies goes beyond their instrumental function, representing a possibility of autonomy, communication and social interaction for students who face accessibility barriers. They range from simple devices, such as magnifying glasses and communication boards, to advanced solutions, such as screen reading software and motion-controlled interfaces. Given their diversity, the implementation of these technologies requires a careful analysis of each student's profile and the specific demands of the school context.

The general objective of this article is to analyze the role of assistive technologies as facilitators of inclusion in the school environment, highlighting their contribution to the learning and participation of students with disabilities. In addition, it seeks to understand how these tools can be efficiently integrated into pedagogical practices, promoting equitable and accessible education for all.

The specific objectives include: (1) identifying the main types of assistive technologies available in the educational context; (2) discussing the pedagogical practices that favor the use of these technologies; and (3) evaluating the challenges and strategies for their implementation in schools. Based on these analyses, we intend to:
- if subsidies are offered for teacher training and inclusive educational planning.

By addressing this topic, we hope to contribute to the understanding of the possibilities and limitations of assistive technologies, highlighting their relevance in building an inclusive school. More than a technical issue, the use of these tools requires an ethical and pedagogical commitment to diversity, reinforcing the transformative role of education in society.

DEVELOPMENT

The use of assistive technologies in the educational environment has become an essential strategy to ensure the inclusion of students with disabilities. According to Mantoan (2015), school inclusion requires changes in the pedagogical structure so that teaching practices meet the diversity of students. In this sense, assistive technologies offer tools that allow overcoming barriers to communication, mobility and access to information, contributing to a more equitable educational experience. For example, screen reading software helps students with visual impairments access digital content, promoting autonomy and independent learning.

According to Almeida and Araújo (2020), assistive technologies can be categorized into high-tech and low-tech resources. Simple devices, such as text magnifiers, can be as effective as complex solutions, such as electronic prosthetics or applications based on artificial intelligence. These tools should be selected considering the individual needs of each student and the established educational objectives, reinforcing the personalization of teaching. "Assistive technology is not just a technical solution; it is a bridge to inclusion and equal opportunities" (ALMEIDA; ARAÚJO, 2020, p. 45). According to Carvalho (2022), assistive technologies play a crucial role in school inclusion, as they allow students with different disabilities to overcome barriers that traditionally limit their participation in the educational process. Even so, their implementation must be accompanied by a pedagogical restructuring that values diversity and recognizes the specific needs of each student. It is not enough to simply provide technological resources; they must be integrated into teaching practices, teachers must be trained to use them and a school environment must be created that promotes access.

However, the implementation of these technologies in schools still faces significant challenges. As Silva (2019) points out, many teachers report difficulties in using assistive technologies due to a lack of adequate training and lack of knowledge about the possibilities offered by these resources.
Menezes and Silva (2022) highlight that adaptive platforms have the potential to promote more personalized learning paths, especially in the context of public education. They offer technological solutions that meet the individual needs of students, adapting the pedagogical content according to the pace and characteristics of each student, which contributes to a more inclusive and effective education. The use of these tools can be an important step forward in the search for an education that respects diversity and promotes equity in access to knowledge. This highlights the need to in-

investments in teacher training and technical support for schools. In addition, institutional barriers, such as the lack of consistent public policies, can limit access to these tools, especially in regions of greater social vulnerability. According to Carvalho:

> [...] information technology and other information and communication technologies do not represent an end in themselves. They are procedures that can improve the educational responses of the school and contribute, within the scope of special education, so that blind, deaf, mentally retarded, cerebral palsy, paraplegic, autistic, multi-disabled, gifted students, among others, can achieve greater quality in their learning processes and exercise of citizenship. (Carvalho, 2001, p. 67).

Carvalho's (2001) thinking reflects a crucial view on the role of technologies in the context of education, particularly in special education. He states that information and communication technologies (ICTs), including computing, should not be seen as an end in themselves, but as tools that can improve the quality of teaching and support the learning of students with different needs. These tools, when used appropriately, have the potential to promote inclusion and ensure the active participation of students with disabilities or specific needs, such as blindness, deafness, cerebral palsy, autism, among other conditions.

This thinking is aligned with the perspective that technology should not replace pedagogical methods, but rather complement and expand the ways of teaching and learning. Despite the challenges, assistive technologies have shown great potential to transform pedagogical practice. For Vieira and Santos (2021), the use of these tools favors not only the inclusion of students with disabilities, but also promotes a culture of accessibility that benefits the entire school community. For example, the adoption of captions in videos and adapted digital teaching materials can serve both students with hearing impairments and students who learn better with visual stimuli, evidencing the concept of Universal Design for Learning (UDL).

In short, assistive technologies represent a significant advance in the search for inclusive education, but their effectiveness depends on an integrated approach. As Carvalho (2022, p.78) highlights, "inclusion will only be complete when technologies are used as part of a pedagogical process that values diversity and respects the uniqueness of each student". Therefore, it is essential that society and the educational system invest in policies that ensure the availability, effective use and ongoing training in the use of these technologies.

Conclusion

Assistive technologies have proven to be essential in the educational context, offering practical solutions for the inclusion of students with disabilities. They allow barriers to communication, mobility and access to information to be overcome, promoting a more equitable environment. As Mantoan (2015) suggests, inclusion requires a change in the pedagogical structure, and the implementation of these technologies should not be seen only as a technical adaptation, but as a fundamental pedagogical strategy for the educational success of all students. The diversity of tools, from simple devices to complex technological solutions, reinforces the personalization of teaching, making it more accessible and effective.

However, the challenges for implementing assistive technologies are still significant, especially with regard to teacher training and school infrastructure. Silva (2019) points out that the lack of training and lack of knowledge of available tools hinder their effective use in schools. For assistive technologies to fulfill their inclusion role, it is essential that teacher education be prioritized, as well as technical support for educational institutions. In addition, the lack of public policies adequate resources worsens inequality in access to these resources, especially in the poorest regions.

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Despite these difficulties, assistive technologies have great potential for transformation, both for students with disabilities and for the entire school community. As highlighted by Vieira and Santos (2021), the use of these technologies favors the creation of a culture of accessibility that benefits all students, whether in the adaptation of teaching materials or in the use of resources such as captions and adapted interfaces. Full school inclusion will only be achieved when technologies are effectively integrated into pedagogical practices, respecting diversity and promoting equity. Therefore, society and the educational system must invest in public policies that ensure the effective use of these tools, guaranteeing a more inclusive and fair education for all.

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