

SCHOOL INCLUSION IN THE DIGITAL AGE: TECHNOLOGICAL RESOURCES FOR STUDENTS WHO ARE THE TARGET AUDIENCE OF SPECIAL EDUCATION

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Abstract

This study aims to analyze the contributions of technological resources to the school inclusion of students eligible for Special Education services, discussing their legal, pedagogical, and technological foundations, as well as the challenges associated with their implementation across education systems. This is a narrative literature review based on scientific articles, books, official documents, and national and international legislation, published primarily between 2020 and 2026. The results show that digital technologies support personalized learning, increase student autonomy, and strengthen inclusive pedagogical practices, provided that they are combined with teacher education, pedagogical planning, and guaranteed digital accessibility. It is concluded that school inclusion in the digital age requires sustained

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investment in technological infrastructure, the development of digital competencies, stronger public policies, and the ethical use of educational technologies to ensure quality education for all.

Keywords: Accessibility, Assistive Technology, Digital Inclusion, Inclusive Education, Special Education.

INTRODUCTION

The expansion of digital technologies has brought about profound changes in education systems, transforming how teaching, learning, assessment, and pedagogical processes are conducted and organized (Kenski, 2012; UNESCO, 2023). In the context of Special Education, these advances take on even greater significance because they enable the development of resources capable of reducing barriers to learning, expanding communication, encouraging participation, and strengthening the autonomy of students eligible for Special Education services (Galvão Filho, 2009; Bersch, 2017). Technology thus ceases to be merely a supplementary tool and becomes an important element in fulfilling the right to inclusive education (Sonza et al., 2013).

The Federal Constitution of 1988 establishes education as a fundamental right for all and requires equal conditions for access to and continued attendance at school. This commitment was expanded by the National Education Guidelines and Framework Law (Law No. 9,394/1996), the National Policy on Special Education from the Perspective of Inclusive Education (2008), the Brazilian Law on the Inclusion of Persons with Disabilities (Law No. 13,146/2015), Law No. 14,533/2023, which established the National Digital Education Policy, and the National Common Curricular Base (*Base Nacional Comum Curricular*—BNCC), which recognizes digital culture as an essential competency in basic education (Brasil, 1988, 1996, 2008, 2015, 2018, 2023). These regulatory instruments reinforce the need to use accessible technologies to ensure equal opportunities for students (Brasil, 2015; UNESCO, 2023).

Inclusive education is grounded in the understanding that everyone has the right to participate fully in educational processes, regardless of physical, sensory, intellectual, or social circumstances

(Mantoan, 2015; Sassaki, 2009). From this perspective, assistive technologies, accessible educational software, screen readers, speech synthesizers, augmentative and alternative communication applications, adapted digital platforms, and artificial intelligence-based resources are important instruments for promoting autonomy, participation, and learning (Bersch, 2017; Galvão Filho, 2009; Pereira; Braz; Gonçalves, 2024).

The COVID-19 pandemic significantly intensified the use of digital technologies in education, revealing both their potential and the inequalities associated with access to technological infrastructure (Pagame et al., 2022; Bueno et al., 2022). The adoption of remote instruction showed that students eligible for Special Education services often encountered difficulties resulting from the absence of accessible resources, insufficient teacher preparation for using assistive technologies, and limitations in public policies aimed at digital inclusion (Pagame et al., 2022). These challenges prompted new discussions concerning digital accessibility, Universal Design for Learning, and pedagogical innovation (CAST, 2024; Gottschalk; Weise, 2023).

At the same time, the development of tools based on artificial intelligence, augmented reality, virtual reality, adaptive learning, and intelligent educational support systems has expanded opportunities for personalized instruction (Molenaar, 2021; Gottschalk; Weise, 2023). However, the specialized literature cautions that merely making technological resources available does not guarantee school inclusion (UNESCO, 2023). The effectiveness of these technologies depends on pedagogical planning, continuing teacher education, school management committed to innovation, and the implementation of public policies capable of ensuring that educational institutions have adequate infrastructure (Borges; Tartuci, 2017; Gottschalk; Weise, 2023).

Internationally, organizations such as the United Nations Educational, Scientific and Cultural Organization (UNESCO), the Organisation for Economic Co-operation and Development (OECD), and the United Nations Children's Fund (UNICEF) recognize digital inclusion as an indispensable component of inclusive education (UNESCO, 2023; Gottschalk; Weise, 2023; UNICEF, 2023). These organizations

maintain that accessible technologies should be used to reduce educational inequalities, expand learning opportunities, and promote greater student participation in democratic school environments (UNESCO, 2023; UNICEF, 2023).

In Brazil, despite regulatory advances, significant challenges remain in implementing inclusive educational technologies (Borges; Tartuci, 2017; Pagaine et al., 2022). Insufficient investment, inequality among education systems, limited technological infrastructure, shortages of adapted equipment, and difficulties in teacher education undermine the effectiveness of inclusive practices mediated by digital resources (Bueno et al., 2022; Pereira; Braz; Gonçalves, 2024). It is therefore necessary to develop a critical understanding of the potential and limitations of using technologies to promote school inclusion (UNESCO, 2023; Gottschalk; Weise, 2023).

In light of this issue, the following research question was formulated: How can technological resources contribute to the school inclusion of students eligible for Special Education services, considering the challenges associated with accessibility, teacher education, technological infrastructure, and the implementation of public policies across education systems?

Within this context, the present study aims to analyze the contributions of technological resources to the school inclusion of students eligible for Special Education services, discussing the legal foundations of digitally inclusive education, the assistive technologies available, the challenges of implementation in public education systems, and prospects for strengthening public policies aimed at inclusion in the digital age.

THEORETICAL FRAMEWORK

School inclusion is a fundamental principle of democratic education systems and is directly related to safeguarding human rights and equal opportunities and valuing diversity. From a contemporary perspective, the use of digital technologies significantly expands opportunities to build accessible educational environments, supporting teaching and learning processes compatible with students' differing

needs. According to Mantoan (2015), school inclusion requires the transformation of pedagogical practices and the reorganization of educational institutions to ensure the effective participation of all students, regardless of their individual circumstances.

This understanding is also advocated by Glat and Nogueira (2002), who emphasize that inclusion is not limited to the physical presence of students with special educational needs in mainstream schools but requires broader changes in the organization of the education system:

[...] The inclusion of individuals with special educational needs in mainstream education is not merely a matter of their remaining alongside other students, nor does it entail denying specialized services to those who require them. On the contrary, it entails reorganizing the education system, which requires reviewing long-standing educational conceptions and paradigms in an effort to make the cognitive, cultural, and social development of these students possible while respecting their differences and meeting their needs (Glat; Nogueira, 2002, p. 26).

Similarly, Santos (2019) emphasizes that an inclusive school must embrace the diversity present in its daily life by recognizing and respecting students' individual characteristics:

[...] An inclusive school is a mainstream school, since any educational environment is expected to welcome all types of students. Various situations and different realities converge in this environment, and each student's individuality is expected to be respected, promoting well-being throughout the student's entire context. This is essential if healthy relationships are to exist both within and beyond the school environment (Santos, 2019, p. 7).

In Brazil, the legal foundations of inclusive education are supported by the Federal Constitution of 1988, the National Education Guidelines and Framework Law (Law No. 9,394/1996), the National Policy on Special Education from the Perspective of Inclusive Education (2008), the Brazilian Law on the Inclusion of Persons with Disabilities (Law No. 13,146/2015), the National Common Curricular Base (BNCC), and Law No. 14,533/2023, which established the National Digital Education Policy. These regulatory instruments recognize the use of accessible technological resources as an indispensable strategy for ensuring equal opportunities and eliminating barriers to learning.

Within this context, educational technology should not be understood merely as the presence of equipment or tools in the school environment, but rather as a body of knowledge, processes, and strategies intended to address educational needs. Brito and Purificação (2012) state:

The use of educational technologies has been characterized from two perspectives: the first is linked to the use of media for their own sake, while the second is associated with the “family” of resources used to address educational problems. The second perspective was widely disseminated in Brazil until the mid-1980s, when educational technology was understood primarily as the relationship between technology and education, embodied in a dynamic and open set of principles and processes for educational action resulting from the application of scientific knowledge and organized to solve or propose solutions to educational problems (Bruto; Purificação, 2012, p. 39).

Assistive technologies occupy a central position in this process. According to the Brazilian Law on the Inclusion of Persons with Disabilities, assistive technologies encompass products, equipment, methodologies, resources, strategies, practices, and services intended to promote the functioning, autonomy, independence, and social inclusion of persons with disabilities. In the school environment, these resources include screen readers, screen magnifiers, adapted keyboards, speech synthesizers, augmentative and alternative communication applications, speech recognition software, mobility devices, and digital platforms developed in accordance with universal accessibility principles.

Bersch (2006) explains that Assistive Technology encompasses both the resources used by students and the services responsible for identifying and implementing solutions to their functional difficulties:

Assistive Technology (AT) consists of resources and services. A resource is the equipment used by the student that enables or facilitates the performance of a task. An AT service at school is one that seeks to resolve the student’s “functional problems” by finding alternatives that allow the student to participate and engage positively in the various activities found within the school context (Bersch, 2006, p. 283).

The selection of resources should take each student's characteristics, needs, and potential into consideration. In discussing services for students with cognitive disabilities, Oliveira (2021) provides examples of how assistive technologies can be applied:

For students with cognitive disabilities, assistive technology plays an essential role in supporting the development of reading, writing, and logical reasoning skills. Tools such as cognitive stimulation software and adapted educational games enable these students to develop their competencies progressively while respecting their specific needs. These technologies also contribute to autonomy by providing opportunities to perform activities independently and in a personalized manner, which supports their inclusion in the school environment and enables active participation in the proposed activities (Oliveira, 2021, p. 45).

The development of digital resources has also contributed to expanding accessibility for students with sensory disabilities. According to Alves Guimarães et al. (2022, p. 4):

Adaptive platforms are intelligent platforms that use software to assign different and personalized exercises to each student based on their responses and reactions to tasks. They also maintain a knowledge profile for each student, containing elements that indicate how each part of the teaching experience can be individualized. This personalized teaching methodology greatly supports learning, particularly when it is continuously adjusted and developed.

These resources allow content and activities to be accessed through different means, reducing barriers related to communication, perception, and participation in school practices.

The specialized literature also emphasizes the importance of Universal Design for Learning (UDL), a pedagogical approach that proposes designing flexible educational experiences capable of accommodating different forms of information representation, expression of knowledge, and student engagement. This perspective reduces pedagogical barriers by integrating technological resources into curriculum planning from the outset, benefiting not only students eligible for Special Education services but the entire school community.

Another widely discussed issue concerns the development of teachers' digital competencies. Almeida and Valente (2011) assert that the integration of technology and curriculum depends on teachers'

ability to use digital resources critically in meaningful pedagogical practices. In addition, Araripe and Lins (2020) emphasize that initial and continuing teacher education should address competencies related to digital accessibility, assistive technologies, active methodologies, and the ethical use of digital tools, thereby fostering more inclusive educational environments.

In recent years, advances in artificial intelligence have significantly expanded opportunities for personalized learning. Intelligent tools can adapt content, provide immediate feedback, convert text into audio, perform automatic translation into Brazilian Sign Language (*Língua Brasileira de Sinais*—Libras), support augmentative and alternative communication systems, and identify specific learning difficulties. Nevertheless, UNESCO (2023) emphasizes that artificial intelligence in education must be used in accordance with ethical principles relating to data protection, transparency, equity, inclusion, and respect for human rights.

Despite technological advances, several studies indicate that significant inequalities in access to educational technologies remain. Economic barriers, inadequate infrastructure, limited connectivity, a lack of adapted equipment, and insufficient teacher education hinder the implementation of digital inclusion policies, particularly in public education systems. These challenges demonstrate that the digital transformation of education depends on coordination among public investment, institutional planning, and stronger educational policies.

Internationally, UNESCO (2023; 2024), OECD (2023), and UNICEF (2022) recognize digital inclusion as an essential dimension of quality in contemporary education. These organizations advocate using technologies as instruments to reduce inequalities, strengthen collaborative learning processes, and expand student participation in accessible educational environments. They emphasize, however, that technological innovation produces positive outcomes only when integrated with pedagogical practices, professional education, and public inclusion policies.

The use of technological resources in Special Education is therefore not an end in itself, but an instrument for ensuring student participation, learning, autonomy, and comprehensive development. The

literature converges in recognizing that achieving school inclusion in the digital age requires the integration of accessibility, pedagogical innovation, teacher education, democratic school management, and a lasting commitment to the principles of inclusive education.

METHODOLOGY

This study is characterized as a **narrative literature review** employing a qualitative, descriptive, and exploratory approach. It was conducted to analyze the contributions of technological resources to the school inclusion of students eligible for Special Education services, taking pedagogical, technological, legal, and institutional aspects into consideration.

The narrative review was selected because it allows knowledge produced in the fields of Special Education, Educational Technology, Inclusive Education, Educational Psychology, Computer Science, Public Policy, and Teacher Education to be integrated. According to Rother (2007), this type of review makes it possible to identify scientific trends, discuss different theoretical perspectives, and construct interpretive syntheses of emerging and interdisciplinary topics.

The literature search was conducted between May and July 2026 in Scopus, Web of Science, the Education Resources Information Center (ERIC), SciELO, Google Scholar, ScienceDirect, the Virtual Health Library (*Biblioteca Virtual em Saúde*—BVS), and the CAPES Journals Portal. It was supplemented by a consultation of official documents published by the Ministry of Education (*Ministério da Educação*—MEC), the Anísio Teixeira National Institute for Educational Studies and Research (*Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira*—INEP), UNESCO, OECD, UNICEF, and the United Nations (UN).

The descriptors used were "educação inclusiva", "educação especial", "tecnologias assistivas", "tecnologias digitais", "acessibilidade digital", "inteligência artificial na educação", "desenho universal para aprendizagem", "inclusive education", "assistive technology", "digital accessibility", "educational

technology" and "artificial intelligence in education", combined using the Boolean operators AND and OR.

The inclusion criteria encompassed scientific articles, books, book chapters, master's dissertations, doctoral theses, technical documents, legislation, and institutional publications available in full in Portuguese, English, or Spanish and published primarily between 2020 and 2026. The selected works addressed technological resources applied to Special Education, digital inclusion, accessibility, teacher education, public policy, and educational innovation. Classic works considered fundamental to understanding the integration of technology and curriculum were also included.

Duplicate studies, publications that had not undergone peer review, abstracts from scientific events, opinion documents without a methodological basis, and studies focusing exclusively on the technical aspects of technology without an interface with inclusive education were excluded.

RESULTS AND DISCUSSION

The literature analysis shows that incorporating digital technologies into educational settings has produced significant advances in consolidating inclusive education, particularly by expanding opportunities for participation, communication, autonomy, and learning among students eligible for Special Education services (Kenski, 2012; Sonza et al., 2013; UNESCO, 2023). Nevertheless, the studies consistently affirm that merely making technological equipment available does not guarantee school inclusion. The effectiveness of these resources depends on coordination among adequate infrastructure, teacher education, pedagogical planning, school management committed to innovation, and public policies capable of guaranteeing digital accessibility (Mantoan, 2015; Gottschalk; Weise, 2023; UNESCO, 2023).

This understanding is aligned with Mantoan (2015), according to whom inclusion cannot be reduced to a student's physical presence in a mainstream school because it requires changes in pedagogical practices, curriculum organization, and institutional culture itself. From this perspective,

technologies must be linked to pedagogical proposals that recognize diversity and eliminate barriers capable of restricting student participation and learning. Sassaki (2009) adds that accessibility must be understood in its various dimensions, encompassing not only architectural aspects but also communicational, methodological, instrumental, programmatic, and attitudinal conditions.

The results demonstrate that assistive technologies are among the main instruments for eliminating barriers to learning. Bersch (2017) defines Assistive Technology as an interdisciplinary field encompassing resources, services, strategies, and practices intended to enhance the functioning, independence, autonomy, and participation of persons with disabilities. In the school environment, these resources include screen readers, speech synthesizers, screen magnifiers, adapted keyboards, augmentative and alternative communication software, eye-tracking devices, augmentative communication applications, and accessible digital platforms.

These resources significantly enhance the autonomy of students with visual, hearing, physical, or intellectual disabilities and those with autism spectrum disorder. Galvão Filho (2009) emphasizes that Assistive Technology can facilitate students' effective participation in school activities, provided that it is selected according to their individual needs, abilities, and characteristics. Sonza et al. (2013) also emphasize that accessibility and Assistive Technology resources contribute to the social and digital inclusion of persons with disabilities by providing more equitable access to information, communication, and knowledge.

The literature shows that these resources foster greater independence in school activities and expand opportunities for participation in classroom pedagogical practices. Pereira, Braz, and Gonçalves (2024) find that assistive technologies can contribute to the inclusion of students eligible for Special Education services, particularly when the resources are aligned with pedagogical planning and each student's specific needs. However, Borges and Tartuci (2017) caution that conceptual imprecision concerning Assistive Technology can make it difficult for teachers to select and use appropriate resources, thereby undermining their inclusive function.

Another widely identified issue concerns the potential of digital educational platforms to promote personalized learning. Adaptive systems allow content to be presented in different formats, respecting individual learning rates, styles, and needs (Molenaar, 2021; Gottschalk; Weise, 2023). Multimedia tools, audiovisual resources, automatic captions, audio description, translation into Brazilian Sign Language (Libras), and accessible interfaces help expand access to information and strengthen student participation in curricular activities (Sonza et al., 2013; UNICEF, 2022).

Molenaar (2021) emphasizes that artificial intelligence-supported education systems can provide personalized learning pathways by combining teachers' work with tools capable of identifying needs and adapting activities. Personalization, however, should not lead to isolation or fragmentation of the educational process. Its use must be guided by the teacher and integrated with social interactions, curricular objectives, and collective learning experiences.

The studies also reveal the increasing use of artificial intelligence as a tool for supporting inclusive education. Artificial intelligence-based applications enable the automatic adaptation of content, production of accessible materials, speech recognition, machine translation, generation of simplified texts, identification of learning difficulties, and development of personalized learning environments (Molenaar, 2021; UNESCO, 2023). These resources can support students who experience difficulties with communication, reading, writing, mobility, or information processing.

UNESCO (2023), however, emphasizes that these technologies must be used ethically, transparently, and responsibly, in accordance with principles relating to data protection, equity, inclusion, and nondiscrimination. The use of intelligent tools without pedagogical oversight and ethical criteria may reproduce inequalities, create technological dependence, or expose students' personal information. Artificial intelligence should therefore serve as a resource supporting teachers' work rather than replacing pedagogical mediation.

The literature demonstrates that teacher education remains one of the principal challenges to the effective use of inclusive digital technologies. Many teachers still experience difficulties with the

pedagogical use of assistive technologies, the adaptation of digital teaching materials, the planning of accessible activities, and the use of inclusive educational platforms (Borges; Tartuci, 2017; Bueno et al., 2022). These difficulties show that technical proficiency with equipment, although necessary, is insufficient to transform pedagogical practices.

Kenski (2012) states that integrating technologies into education requires changes in how teaching, learning, and pedagogical work are organized. From this perspective, teacher education must enable teachers to understand the potential, limitations, and pedagogical implications of digital tools. Borges and Tartuci (2017) reinforce that professional education should encompass conceptual and practical knowledge of Assistive Technology, preventing resources from being used out of context or without alignment with students' needs.

Another recurring finding concerns inequalities in access to technological infrastructure. Several studies indicate that public schools still face constraints related to the availability of equipment, connectivity, technological maintenance, and the acquisition of assistive technologies (Gottschalk; Weise, 2023; UNESCO, 2023). These inequalities undermine the continuity of digital pedagogical practices and more severely affect students experiencing social vulnerability or requiring specialized resources.

These difficulties intensified during the period of emergency remote instruction resulting from the COVID-19 pandemic, when many students eligible for Special Education services were unable to participate adequately in school activities because accessible digital resources were unavailable. Pagaime et al. (2022) identified obstacles related to access to technologies, adaptation of activities, pedagogical support, and communication among teachers, students, and families. Bueno et al. (2022) likewise demonstrated that serving these students during remote instruction required replanning, curricular flexibility, and coordination between mainstream classroom teachers and Special Education professionals.

The findings of these studies indicate that digital inequality is not limited to a lack of internet access or equipment. It also encompasses connection quality, platform accessibility, the availability of adapted resources, and the competencies necessary to use them. Gottschalk and Weise (2023) note that

digital equity requires effective conditions for access, participation, and learning, taking into account the social, economic, territorial, and educational differences among students.

The research also shows that Universal Design for Learning (UDL) is an important strategy for integrating technologies into pedagogical processes. This approach proposes that curricula be designed from the outset to accommodate different forms of content presentation, expression of knowledge, and student participation, thereby reducing the need for later adaptations. According to CAST (2024), UDL is structured around three fundamental principles: providing multiple means of engagement, multiple means of representation, and multiple means of action and expression.

The studies demonstrate that the coordinated use of UDL and digital technologies expands learning opportunities for all students and supports more inclusive pedagogical practices. Resources such as adjustable digital texts, audio materials, captioned videos, audio description, tactile materials, images, graphs, and interactive activities allow the same content to be accessed and understood through different means. Planning therefore ceases to focus on individual limitations and instead considers the barriers present in curricula, materials, and methodologies (CAST, 2024; UNESCO, 2023).

Another issue identified concerns the strategic role of school management in implementing inclusive educational technologies. School leaders committed to pedagogical innovation promote investment in technological infrastructure, school staff education, institutional planning, and the acquisition of accessible resources. Educational leadership directly influences the consolidation of a school culture conducive to digital inclusion by encouraging collaborative practices among teachers, Specialized Educational Support (*Atendimento Educacional Especializado*—AEE) professionals, families, and the community (Mantoan, 2015; UNESCO, 2023).

School management is also responsible for identifying existing barriers and organizing the human, pedagogical, and technological resources necessary to address them. Inclusion requires shared institutional work and cannot be attributed exclusively to mainstream classroom teachers or AEE professionals. This understanding is present in the National Policy on Special Education from the

Perspective of Inclusive Education, which provides guidance on coordination among mainstream education, Specialized Educational Support, and other support services (Brasil, 2008).

The results also indicate that family participation is a relevant factor in the success of inclusive practices mediated by digital technologies. Family involvement facilitates the appropriate use of technological resources outside the school environment, strengthens communication between schools and students' legal guardians, and expands support for students' academic development. UNICEF (2022) emphasizes that implementing Assistive Technology should involve teachers, specialized professionals, students, and family members so that resources are used continuously and in a manner compatible with the different contexts of students' lives.

Coordination among schools, families, and public policies is therefore essential to enhance the benefits provided by assistive technologies. Family participation, however, must not entail transferring the school's educational responsibilities to students' legal guardians. Educational institutions are responsible for providing guidance, monitoring, and technical-pedagogical support so that families can participate collaboratively in the process.

At the public policy level, the literature shows that achieving school inclusion in the digital age depends on continuous investment in connectivity, technological infrastructure, teacher education, and the development of accessible pedagogical materials. The Federal Constitution of 1988 and the National Education Guidelines and Framework Law establish education as a right for all and mandate equal conditions for access to and continued attendance at school (Brasil, 1988, 1996).

The National Policy on Special Education from the Perspective of Inclusive Education reinforces the right of students eligible for Special Education services to attend mainstream classes in conjunction with access to Specialized Educational Support (Brasil, 2008). The Brazilian Law on the Inclusion of Persons with Disabilities requires the elimination of barriers and the adoption of Assistive Technology and accessibility resources, while the National Common Curricular Base recognizes digital culture as a fundamental competency in basic education (Brasil, 2015, 2018).

The National Digital Education Policy, established by Law No. 14,533/2023, represents another advance toward building more inclusive education systems by establishing guidelines concerning digital inclusion, digital education in schools, professional development, and research and development in information and communication technologies (Brasil, 2023). Its implementation, however, still faces challenges related to funding, regional inequalities, and the capacity of public education systems to incorporate technological innovations into everyday school life.

The analyses also demonstrate that advances in digital technologies expand opportunities to build personalized and accessible educational environments but require constant attention to ethical issues. The use of artificial intelligence, educational data analytics, and digital platforms must respect student privacy, prevent discriminatory bias, and ensure transparency in the use of information produced by technological systems (Molenaar, 2021; Gottschalk; Weise, 2023; UNESCO, 2023).

Data protection becomes even more important when technologies are used with children, adolescents, and students with disabilities, as these groups may be more exposed to risks associated with collecting, storing, and sharing personal information. Innovation must therefore remain subordinate to the principles of human dignity, safety, accessibility, equity, and nondiscrimination.

Overall, the literature converges in recognizing technological resources as important instruments for strengthening contemporary inclusive education (Bersch, 2017; Sonza et al., 2013; UNESCO, 2023). Their potential is fully realized, however, only when they are integrated into pedagogical practices grounded in inclusion, accessibility, teacher education, democratic management, and the implementation of public policies capable of ensuring equal opportunities and meaningful learning for all students (Mantoan, 2015; Gottschalk; Weise, 2023).

To systematize the review's principal findings, Table 1 presents the categories that appeared most frequently in the studies analyzed, relating each dimension to the contributions identified and the authors underpinning the discussion.

Table 1

Summary of the principal findings concerning digital technologies and school inclusion

Category of analysis	Summary of findings	Reference authors and documents
Assistive technologies	Screen readers, speech synthesizers, adapted keyboards, augmentative and alternative communication, and other resources enhance the functioning, autonomy, and participation of students eligible for Special Education services.	Bersch (2017); Galvão Filho (2009); Sonza et al. (2013); Pereira, Braz, and Gonçalves (2024)
Personalized learning	Adaptive platforms and multimodal resources enable content to be presented in different formats, taking different learning rates, needs, and approaches into consideration.	Molenaar (2021); Gottschalk and Weise (2023); UNICEF (2022)
Artificial intelligence	Intelligent tools can adapt content, simplify texts, recognize speech, and support the identification of difficulties, but they require teacher mediation and ethical use.	Molenaar (2021); UNESCO (2023)
Teacher education	The inclusive use of technology depends on pedagogical, digital, and conceptual knowledge concerning accessibility and Assistive Technology and is not limited to technical proficiency with equipment.	Kenski (2012); Borges and Tartuci (2017); UNESCO (2023)
Infrastructure and digital equity	A lack of equipment, connectivity, maintenance, and accessible resources limits student participation and deepens inequalities among education systems and regions.	Bueno et al. (2022); Pagaime et al. (2022); Gottschalk and Weise (2023)
Universal Design for Learning	Planning multiple means of engagement, representation, action, and expression reduces curricular barriers and benefits all students.	CAST (2024); UNESCO (2023)
School management and collaborative work	Implementing inclusive technologies requires leadership, institutional planning, and collaboration among teachers, AEE professionals, specialized professionals, and the school community.	Mantoan (2015); Brasil (2008); UNESCO (2023)
Family participation	Coordination between schools and families supports continued use of resources, the monitoring of activities, and the identification of student needs.	UNICEF (2022); Mantoan (2015)
Public policies and legislation	Guaranteeing digital inclusion depends on giving effect to educational rights, accessibility, specialized support, and sustained public investment.	Brasil (1988, 1996, 2008, 2015, 2018, 2023)
Ethics, privacy, and data protection	The use of artificial intelligence and digital platforms must respect transparency, safety, privacy, equity, and nondiscrimination.	Molenaar (2021); Gottschalk and Weise (2023); UNESCO (2023)

Source: Prepared by the authors (2026), based on the studies analyzed.

The organization of the categories in Table 1 demonstrates that the contributions of technology to school inclusion extend beyond the provision of equipment or digital platforms. Their outcomes encompass dimensions related to student autonomy, personalized learning, curricular accessibility, teacher education, collaborative work, and the consolidation of inclusive public policies.

At the same time, the challenges identified indicate that the effectiveness of these resources depends on adequate infrastructure, connectivity, professional education, pedagogical planning, participatory school management, and ethical oversight of technological innovation. Digital technologies therefore contribute effectively to inclusion only when incorporated into an educational project committed to eliminating barriers and guaranteeing the participation and learning of all students.

CONCLUSION

This narrative review made it possible to analyze the contributions of technological resources to the school inclusion of students eligible for Special Education services, showing that digital technologies are important instruments for promoting accessibility, autonomy, participation, and learning. The literature demonstrates that incorporating assistive technologies, accessible digital platforms, artificial intelligence, and the principles of Universal Design for Learning significantly expands educational opportunities, supporting more equitable and personalized pedagogical practices.

The results showed that the use of technology in inclusive education extends beyond the technical dimension and requires the integration of pedagogical innovation, curriculum planning, teacher education, school management, and public policy. Merely making equipment or software available does not guarantee effective inclusion. These resources must be aligned with pedagogical practices grounded in human rights, the valuing of diversity, and a commitment to every student's learning.

Another relevant aspect identified concerns the initial and continuing education of education professionals. Developing digital competencies related to accessibility, the use of assistive technologies, and the preparation of inclusive teaching materials is essential if teachers and school leaders are to use technological resources critically, ethically, and in pedagogically meaningful ways. Valuing professional education strengthens teacher autonomy and expands schools' capacity to respond to the demands of inclusive education in a digital society.

The research also demonstrated that significant challenges remain in relation to the technological infrastructure of public education systems. Unequal internet access, insufficient adapted equipment, limited financial resources, and regional differences undermine the effectiveness of digital inclusion policies. These factors reinforce the need for continuous public investment in connectivity, assistive technologies, digital accessibility, and stronger infrastructure in educational institutions.

Another relevant finding concerns the strategic role of school management in implementing inclusive technologies. School leaders committed to educational innovation support the creation of collaborative environments, encourage continuing education for school staff, and promote institutional processes aimed at integrating technologies into the curriculum. Similarly, family participation and coordination among education, health care, and social assistance enhance the effectiveness of initiatives intended to include students eligible for Special Education services.

The discussions analyzed also show that advances in artificial intelligence, adaptive learning, and accessible digital platforms expand opportunities for personalized instruction. These technologies, however, must be used in accordance with ethical principles concerning data protection, transparency, equity, and the prevention of discriminatory practices. Technological innovation must remain subordinate to educational objectives and students' fundamental rights, strengthening inclusive education without replacing the indispensable role of human mediation.

A limitation of this study is that the investigation was conducted through a narrative literature review and did not include empirical analysis of the use of assistive technologies in specific school contexts. Future research should conduct field studies involving public and private schools to investigate the effects of digital technologies on indicators of learning, development of autonomy, accessibility, and school inclusion.

It is therefore concluded that school inclusion in the digital age depends on coordination among technological innovation, teacher education, democratic school management, public inclusion policies, and guaranteed digital accessibility. Educational technologies are fundamental tools for expanding

opportunities for learning and participation, provided that they are used ethically, intentionally, and in accordance with the principles of inclusive education. Strengthening these initiatives will contribute to building more democratic and equitable education systems that are better prepared to address the challenges of contemporary society.

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