

OS RECURSOS DE ACESSIBILIDADE E TECNOLOGIA ASSISTIVA NA SALA DE RECURSOS MULTIFUNCIONAIS NAS ESCOLAS MUNICIPAIS DE MANAUS/AM

RECURSOS DE ACCESIBILIDAD Y TECNOLOGÍA DE ASISTENCIA EN EL AULA DE RECURSOS MULTIFUNCIONALES EN LAS ESCUELAS MUNICIPALES EN MANAUS/AM

ACCESSIBILITY AND ASSISTIVE TECHNOLOGY RESOURCES IN THE MULTIFUNCTIONAL RESOURCES ROOM AT MUNICIPAL SCHOOLS IN MANAUS/AM

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RESUMO: Este artigo tem como objetivo discutir a acessibilidade e a tecnologia assistiva nas salas de recursos multifuncionais, através das pesquisas realizadas em escolas municipais de Manaus. Analisou-se as pesquisas de Batista (2015), Bruce (2015) e Nogueira (2017), que realizaram visitas em Salas de Recursos Multifuncionais (SRM) de escolas municipais de Manaus, com o objetivo de conhecer seus recursos de acessibilidade e tecnologia assistiva utilizados no Atendimento Educacional Especializado (AEE). Verifica-se que os estudos ganham força na medida em que se constituem em elementos que se propõem a trazer respostas positivas quanto à inclusão social e escolar de pessoas com deficiência. Este estudo revela que a disponibilização e uso desses materiais escolares e recursos pedagógicos adaptados podem significar a diferença entre o educando com deficiência poder ou não participar e aprender junto com os demais colegas de sala.

PALAVRAS-CHAVE: Acessibilidade. Tecnologia assistiva. Sala de recursos multifuncionais. Inclusão escolar.

RESUMEN: *Este artículo tiene como objetivo discutir la accesibilidad y la tecnología de asistencia en aulas de recursos multifuncionales, a través de la investigación realizada en las escuelas municipales de Manaus. La investigación de Batista (2015), Bruce (2015) y Nogueira*

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(2017), que visitaron los aulas de recursos multifuncionales (SRM) en las escuelas municipales de Manaus, se analizó para conocer su accesibilidad y los recursos tecnológicos de asistencia utilizados en Servicio Educativo Especializado (AEE). Se percibe que los estudios ganan fuerza, a medida que son elementos que tienen como objetivo brindar respuestas positivas con respecto a la inclusión social y educativa de las personas con discapacidad. Este estudio revela que la disponibilidad y el uso de estos materiales escolares y recursos pedagógicos adaptados pueden significar la diferencia entre que el estudiante con discapacidades pueda participar o no y aprender junto con otros compañeros de clase.

PALABRAS CLAVE: Accesibilidad. Tecnología de asistencia. Aula de recursos multifuncional. Inclusión escolar.

ABSTRACT: This article aims to discuss accessibility and assistive technology in multifunctional resource rooms, through research conducted in municipal schools in Manaus. The research of Batista (2015), Bruce (2015) and Nogueira (2017), who visited Multifunctional Resource Rooms (SRM) in municipal schools in Manaus, was analyzed in order to learn about their accessibility and assistive technology resources used in Specialized Educational Service (AEE). It appears that studies are gaining strength as they are elements that aim to bring positive responses regarding the social and educational inclusion of people with disabilities. This study reveals that the availability and use of these school materials and adapted pedagogical resources can mean the difference between the student with disabilities being able to participate or not and learn together with other classmates.

KEYWORDS: Accessibility. Assistive technology. Multifunctional resource room. School inclusion.

Introduction

Historically, people targeted by special education (people with disabilities, global developmental disorders and high skills/giftedness) have been treated with prejudice and discrimination. However, in the last decades we have observed an international movement, based on the conception of human rights, which moves towards providing these individuals with fundamental rights, such as school education.

In this perspective, nowadays, discussions about the need for society as a whole to become a space that has conditions, which provide the development of all people, regardless of their differences and individual needs, are established. Thus, this work supports the concept of social inclusion as “a process by which society adapts to be able to include in its social systems” (SASSAKY, 1997, p. 41).

In this thinking, the process of social inclusion develops against the attitudes of discrimination and exclusion of men and women from the common spaces of life in society. It signals the respect for human rights, and is characterized by the need to adapt society so that it



can accommodate and include all subjects and their inherent diversity in their systems of social organization.

Under this perspective, the National Policy on Special Education from the perspective of Inclusive Education (BRASIL, 2008) ensures the school inclusion of target students of special education: disability, global developmental disorders and high skills/giftedness, guaranteeing, among other points, the provision of specialized educational services and architectural accessibility, in transport, furniture, communications and information.

Thus, this article aims to discuss accessibility and assistive technology in multifunctional resource rooms, through research conducted in municipal schools in Manaus.

Methodology

This study focuses on the qualitative approach. For the research design, documentary research was used, guided by the dialectic method.

To meet the research objectives, the guiding documents that characterize the school inclusion policy in Brazil were raised (BRASIL, 2008; 2009; 2011; 2015).

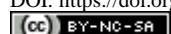
Subsequently, the research by Batista (2015), Bruce (2015) and Nogueira (2017), who visited Multifunctional Resource Rooms (SRM, Portuguese initials) in municipal schools in Manaus, was analyzed, with the objective of learning about their accessibility resources and assistive technology used in Specialized Educational Assistance (AEE, Portuguese initials) in which they performed direct, open, non-participatory and systematic observation.

Accessibility, Assistive Technology and Specialized Educational Service: reflections on an inclusive school

In the context of inclusive education, special education goes through a process of reframing, in which it moves in the direction of working in conjunction with common education. From this point of view, special education should be integrated into the pedagogical proposal of the common school (BRASIL, 2008).

Faced with this thought, special education:

It is a teaching modality that cuts across all school levels, stages and modalities, provides specialized educational assistance, makes resources and services available, and provides guidance on the use of resources and services



in the teaching and learning process in common classes of regular education (BRASIL, 2008, p. 21).⁵

We note that one of the elements of this definition is that special education is responsible for providing Specialized Educational Assistance, which in this context has the function of identifying, developing and organizing educational and accessibility resources. These resources are intended to remove barriers to full student participation, considering their specific needs. These activities are different from the activities of the common room, but not a substitute. Attendance that complements and/or supplements the student's formation that aims at autonomy and independence inside and outside the school. It constitutes a mandatory offer from the education systems and must be offered in the reverse shift from ordinary education (BRASIL, 2008).

Among the activities provided by the Specialized Educational Service, there are: curriculum enrichment programs; teaching specific communication and signaling languages and codes; assistive technology [...] (BRASIL, 2008).

Within the meaning of Decree no. 7,611, of November 17, 2011 (BRASIL, 2011), specialized educational assistance is considered as:

[...] the set of activities, accessibility and pedagogical resources organized institutionally, provided in a complementary or supplementary way to the formation of students in regular education (BRASIL, 2011)⁶

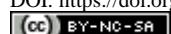
We note that this decree also defines the AEE as the “accessibility and pedagogical resources”, which includes assistive technology resources. Accordingly, Resolution no. 4/2009, of October 2, 2009 (BRASIL, 2009), establishes the Operational Guidelines for Specialized Educational Assistance in Basic Education:

[...] accessibility resources in education are considered for those who ensure conditions of access to the curriculum of students with disabilities or reduced mobility, promoting the use of didactic and pedagogical materials, spaces, furniture and equipment, communication systems and information, transport and other services (BRASIL, 2009).⁷

⁵ É uma modalidade de ensino que perpassa todos os níveis, etapas e modalidades escolares, realiza o atendimento educacional especializado, disponibiliza os recursos e serviços, e orienta quanto à utilização dos recursos e serviços no processo de ensino aprendizagem nas turmas comuns do ensino regular (BRASIL, 2008, p. 21).

⁶ [...] o conjunto de atividades, recursos de acessibilidade e pedagógicos organizados institucionalmente, prestados de forma complementar ou suplementar à formação dos alunos no ensino regular” (BRASIL, 2011)

⁷ [...] consideram-se recursos de acessibilidade na educação àqueles que assegurem condições de acesso ao currículo de alunos com deficiência ou mobilidade reduzida, promovendo a utilização de materiais didáticos e pedagógicos, dos espaços, dos mobiliários e equipamentos, dos sistemas de comunicação e informação, dos transportes e dos demais serviços (BRASIL, 2009).



For Sartoretto (2014), specialized educational assistance has as fundamental assumption the right of the child with a disability to study in the common school and to progress according to its limits and possibilities.

In this scenario of valuing human diversity, the literature points that words like accessibility gain importance in the vocabulary of government officials, lay people and researchers, but is still often used incoherently, assigning functions to the term that do not end the concept originally created. An issue that has caused confusion is the relationship between the term access and accessibility (MANZINI, 2014).

The meaning of the word access can be to enter a space, join some service, get information, leave one level to enter another. “[...] These are struggles to guarantee equal rights for all people” (MANZINI, 2014, p. 19). The term *accessibility*, in turn, refers to something external to the subject, related to the conditions of use of social spaces, urban equipment and other elements that the person uses in their daily activities. “[...] therefore, accessibility is not for someone, but something for someone” (MANZINI, 2014, p. 19).

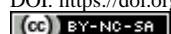
In this sense, the understanding of the concept of accessibility in this work is based on the proposition of the Brazilian Law for the Inclusion of Persons with Disabilities - Law 13,146 of July 6, 2015 (BRASIL, 2015), which defines it as:

[...] possibility and condition of reach for safe and autonomous use of spaces, furniture, urban equipment, buildings, transport, information and communication, including their systems and technologies, as well as other services and facilities open to the public, for public use or private for collective use, both in urban and rural areas, by people with disabilities or with reduced mobility (BRASIL, 2015).⁸

The concept proposed by this law deals with the conditions that social spaces, equipment and other elements that are part of people's daily activities, such as school institutions, need to be able to respond to the demands of all subjects.

Manzini (2014) highlights that taking into account that the premise of the concept of accessibility is the relationship between people and objects, it would be possible, within an inclusive conception, to defend this concept for educational activities. Also, considering the definition presented by the Brazilian legislation, it is possible to glimpse the possibility of expanding the concept beyond urban facilities, such as the resources to be used by the teacher

⁸ [...] possibilidade e condição de alcance para utilização, com segurança e autonomia, de espaços, mobiliários, equipamentos urbanos, edificações, transportes, informação e comunicação, inclusive seus sistemas e tecnologias, bem como de outros serviços e instalações abertos ao público, de uso público ou privados de uso coletivo, tanto na zona urbana como na rural, por pessoa com deficiência ou com mobilidade reduzida (BRASIL, 2015).



to teach students with disabilities. “In this sense, the concept of accessibility is perfectly combined with the concept of Assistive Technology for education” (MANZINI, 2014, p. 25).

In this way, the concept of accessibility for education can be interpreted as:

[...] a condition for safe and complete or assisted use of school spaces, school furniture, school equipment, school transport services and school information and communication devices, systems and means (MANZINI, 2014, p. 67).⁹

Based on this premise, Assistive Technology (AT) resources can be considered an important strategy for accessibility and school inclusion of students with disabilities, who will find, in the school space, the appropriate conditions for safe and autonomous use, total or assisted of school materials and teaching resources that respond to the demands of tasks to be performed inside and outside the classroom.

We can then say that the greatest goal of AT is to provide people with disabilities with greater independence, quality of life and social inclusion, through the expansion of their communication, mobility, control of their environment, learning and work skills (BERSCH, 2013, p. 65).¹⁰

In light of what the text above points out, the use of Assistive Technology resources is not limited to the school context and to high-cost computerized equipment.

According to Manzini (2005, p. 82):

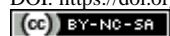
Assistive technology resources are very close to our daily lives. Now they impact us due to the technology they present, sometimes they go almost unnoticed. For example, we can call assistive technology a cane, used by our grandparents to provide comfort and safety when walking, as well as an amplification device used by a person with moderate deafness or even a vehicle adapted for a person with physical disabilities.¹¹

Still on the aforementioned question, Sartoretto (2014) points out that AT resources can vary from a simple cane to a complex computer system. Included in this context are alternative communication equipment, computers, special software, drivers, among others.

⁹ [...] uma condição para utilização com segurança e autonomia total ou assistida, dos espaços escolares, dos mobiliários escolares, dos equipamentos escolares, dos serviços de transporte escolares e dos dispositivos, sistemas e meios de informação e comunicação na escola (MANZINI, 2014, p. 67).

¹⁰ Podemos então dizer que o objetivo maior da TA é proporcionar à pessoa com deficiência maior independência, qualidade de vida e inclusão social, através da ampliação de sua comunicação, mobilidade, controle de seu ambiente, habilidades de seu aprendizado e trabalho (BERSCH, 2013, p. 65).

¹¹ Os recursos de tecnologia assistiva estão muito próximos do nosso dia a dia. Ora eles nos causam impacto devido à tecnologia que apresentam, ora passam quase despercebidos. Para exemplificar, podemos chamar de tecnologia assistiva uma bengala, utilizada por nossos avós para proporcionar conforto e segurança no momento de caminhar, bem como um aparelho de amplificação utilizado por uma pessoa com surdez moderada ou mesmo veículo adaptado para uma pessoa com deficiência física.



These can vary from elements that can be built manually by teachers or resources with more advanced technology such as those related to computerized systems. A simple pencil thickener or a screen reader for the blind, as long as it gives functionality, facilitating the execution of daily tasks of people with disabilities can be considered an AT. Thus, it will not be the technological level of the resource that will define it as being or not being AT, but the fact that this element brings or does not bring functionality to the tasks to be performed by subjects with some disability.

Rocha (2013), also talking about the classification of AT, infers that these can be classified into resources of high Assistive Technology or low Assistive Technology depending on the way they are made, their complexity and their final cost. In this perspective, low AT resources are those produced in an artisanal and individualized manner, they are unsophisticated and manufactured with low-cost materials.

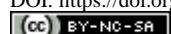
High AT resources, in turn, are composed of more elaborate equipment manufactured on an industrial scale, thus requiring highly specialized professionals for its construction. Its use is generally associated with computerized or electronic systems (ROCHA, 2013).

In reference to the relationship between AT and the school inclusion process of students with disabilities, several studies have highlighted the importance of AT resources and services so that special education students can break the social and pedagogical barriers in their schooling process.

Galvão Filho (2011) points out that many times the availability of resources and simple and handmade adaptations, such as fixing with adhesive tape, pencil thickeners, support for viewing texts and books, can make the difference between students with disabilities being able or not being able study and learn together with your colleagues.

Alves (2009) conducted a research with the objective of identifying the effects of using AT in the context of schooling of students with cerebral palsy from the perception of the students themselves, their teachers and their caregivers. The research results demonstrate that all participants recognize the Assistive Technology resources as an auxiliary resource for production, participation and, consequently, favor the schooling of students with cerebral palsy.

Bersch (2009), in his master's dissertation entitled *Design de um Serviço de Tecnologia Assistiva (Design of an Assistive Technology Service)* in public schools, argues that education does AT as it investigates needs and proposes alternatives that promote the participation of students with disabilities in the challenges of the school context aimed at promoting the autonomy and learning of these subjects.



Galvão Filho (2009) investigated, through a case study, the appropriation processes by the public school of basic education, in the city of Salvador-Bahia, of the Assistive Technology necessary for the school inclusion of students with disabilities. The results of his studies show that, despite difficulties and obstacles, there are advances and achievements in the process of appropriation of these resources by the schools surveyed.

Based on the results of his investigation, the author presents concrete possibilities for new horizons, perspectives and public policies, which move towards providing advancement related to the use of AT in public schools. In this sense, the implementation of a Reference Center in Assistive Technology and Accessibility is suggested, as well as the construction of telematic learning environments that favor educational practices that respond to the demands of today's society.

Rocha (2010), with the aim of describing the process of prescribing and making Assistive Technology resources for early childhood education, infers that this has been gaining an important space in education, providing students with disabilities accessibility for the development of different tasks. In this line, AT makes it possible to offer resources, services and strategies, which aim to meet the specific characteristics of students with physical disabilities, making the school truly inclusive. From the social model of disability, the removal of barriers through the use of Assistive Technology in the school context shifts the limitations to the environment, thus contributing to the accessibility of students with disabilities. The author concludes that, to perform the prescription of Assistive Technology resources, it is necessary to systematize stages with specific procedures, such as understanding the situation of the entire school context; know the student's personal characteristics, desires and development; establish your skills and needs, among others.

Rocha (2013), in a doctoral thesis carried out with the purpose of evaluating the use of Assistive Technology resources during teaching activities and identifying the strategies used in order to mediate the use of these resources with children with cerebral palsy through collaborative teaching among health and education professionals, it appears that the intervention program, through collaborative teaching, favored the use of Assistive Technology in the school context, and the strategies carried out through collaborative actions benefited the student's abilities for the usability of the resource. Through the study, the researcher was also able to establish guiding parameters for assessing the usability of Assistive Technology by children with cerebral palsy in early childhood education.

Thus, the research carried out, which, according to Souza (2006), is also an offshoot of public policies, signals the importance of using AT resources in the schooling process of



children with physical disabilities. However, the authors suggest that in carrying out this process it is necessary to take into account elements such as: the school context, the student's personal characteristics and needs, assessment of the usability of AT resources, among others. In addition to presenting suggestions regarding the creation of Reference Centers in Assistive Technology and Accessibility and the construction of telematic learning environments.

However, for Oliveira and Mill (2016), research on Accessibility, Assistive Technology and School Inclusion is still few when one thinks about the relevance of these elements for the process of school inclusion of the target students of special education.

Accessibility and assistive technology resources in the multifunctional resource room of municipal schools in Manaus/AM

Located in the northern region of the country, the municipality of Manaus, capital of the state of Amazonas, has, according to the census of the Brazilian Institute of Geography and Statistics (IBGE, Portuguese initials) in 2019, an estimated population of 2,182,763 inhabitants.

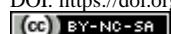
The Municipal Education Secretariat of Manaus (SEMED/Manaus – Portuguese initials) is composed of 491 schools, distributed in seven district zones, among them: South Zone, Central South Zone, North Zone, West Zone, East Zone I, East Zone II and Rural Zone; and has 46 rooms with multifunctional resources.

However, the study by Santos *et al.* (2017) pointed out that in order to meet the demand of target-students of special education of the Municipal Network of Manaus, it would be necessary to implement another 30 rooms with multifunctional resources.

In this perspective, the study by Bruce (2015) identified that the Multifunctional Resource Rooms have become one of the main developments of policies aimed at the implementation of pedagogical Accessibility resources at school, with a view to favoring access, participation and learning of the target audience of special education from the perspective of inclusive education

These rooms were provided by an Assistive Technology resource kit in an attempt to enable schools to have access to these resources and, consequently, their use for students targeted by Special Education (MANZINI, 2013).

This kit is basically built by equipment, furniture and didactic and pedagogical materials. The last category includes school materials and teaching resources such as: incline plane / support for books, alphabet and mobile syllables, embedded alphabet mat, dominoes of association of ideas, and expanded keyboard with beehive (MANZINI, 2013; BRASIL, 2010).



Batista (2015) found that the Multifunctional Resource Room had white floors, walls and ceilings, therefore, there was no contrast between the structures, to facilitate the perception of students with low vision, in addition to the door not having alternative identification of identification for which it is intended.

SRM had only one environment, and its dimensions do not allow certain activities, such as orientation and mobility, for the acquisition of notions of spatiality and other bodily, physical-motor work, or Activity of Daily and Social Life (ADSL).

The survey also registered that there are no adapted bathrooms and tactile floors. Among the resources were identified a mobile alphabet, alphabet in LIBRAS, alphabet in Braille, the logical reasoning games (puzzle, domino, logic blocks, numerical sequence and wooden mobile operation), tangram, game for motor coordination in wood, large geometric figures of rubberized material and books in Braille. Some of these materials were made by the SRM teacher, while most were collected at the school itself.

According to the Guidance Manual for the installation of SRMs (BRASIL, 2010), they must be structured as follows: Type I room specifications:

Figure 1 - Specifications¹²

QUANT	MATERIAL	QUANT	MATERIAL
02	Microcomputadores	01	Material dourado
01	Laptop	01	Esquema corporal
01	Estabilizador	01	Bandinha ritmaca
01	Scanner	01	Memorias de numerais
01	Impressora a laser	01	Tapeta alfabeto encaixado
01	Teclado com Colmeia	01	Software comunicação alternativa
01	Acionador de pressão	01	Sacolão criativo monta tudo
01	Mouse com entrada p/ acionador	01	Quebra-cabeça sequencias logicas
01	Lupa eletrônica	01	Domino de associação de ideias

Source: Batista (2015).

Figure 2 - Specifications¹³

¹² We read on the figure: First column: Quantity. / Second column: Material; Computers; Laptop; Stabilizer; Scanner; Laser Printer; Keyboard with hive; Pressure trigger; Mouse with trigger slot; Electronic magnifier./ Third column: Quantity. / Fourth column: Golden material; Corporal scheme; rhythmic band; Numerals memorials; Alphabet embedded mat; Alternative communication software; Creative bag craft everything; Puzzles of logical sequences; Idea association dominoes.

¹³ We read on the figure: First column: Quantity. / Second column: Domino with phrases; Domino with animals in LIBRAS; Domino with fruits in LIBRAS; Tactile Domino; Braille Alphabet; Manual magnifiers kit; Tilted plan; Tactile memory. / Third column: Quantity. / Fourth column: Round table; Chairs; Printer table; Cabinet; White board; Computer tables; Chairs; Reading support.



QUANT	MATERIAL	QUANT	MATERIAL
01	Domino de frases	01	Mesa redonda
01	Domino de animais em LIBRAS	04	Cadeiras
01	Domino de frutas em LIBRAS	01	Mesa para impressora
01	Domino tátil	01	Armário
01	Alfabeto Braille	01	Quadro branco
01	Kit de lupas manuais	02	Mesas para computador
01	Plano inclinado	02	Cadeiras
01	Memoria tátil		Suporte para leitura

Source: Batista (2015).

The type II room, in addition to those that make up the type I room, has accessibility for visually impaired students, namely:

Figure 3 – Specifications¹⁴

QUANT	MATERIAL	QUANT	MATERIAL
01	Impressora Braille de peq porte	01	Maquina de datilografia Braille
01	Reglete de mesa	01	Punção
01	Soroban	01	Guia de assinatura
01	Kit de desenho geométrico	01	Calculadora sonora

Source: BRASIL (2010, p. 10-11).

With regard to the Guidance Manual (BRASIL, 2010), the guidelines move in the direction of the school's Pedagogical Proposal to bring clarifications regarding the organization of the school's pedagogical work, emphasizing aspects such as:

- a) The school's accessibility conditions, with emphasis on pedagogical accessibility (books and texts in accessible formats and other Assistive Technology resources made available at the school);
- b) The articulation between the teacher in the multifunctional resource room and the teacher in the regular room;
- c) Planning for Specialized Educational Assistance.

Based on this recommendation, we observed that the conditions of accessibility to school materials and pedagogical resources, which include Assistive Technology resources, constitute an important point when it comes to demonstrating, through the pedagogical proposal of a school institution, its commitment to an education for all.

Nogueira (2017), on the other hand, presents the pedagogical instruments proposed by Assistive Technology that help students with disabilities, transforming them into active subjects

¹⁴ We read on the figure: First column: Quantity. / Second column: Material; Small Braille printer; Table reglete (Braille writing instrument); Soroban; Geometrical drawing kit. / Third column: Quantity. / Fourth column: Braille typing machine; Puncture; Signature guide; Sound calculator.



in the classroom, as the use of these instruments helps in reducing the difficulties that interfere in the teaching and learning process.

The making of materials in a handmade way appreciates the needs present in the educational area. These materials can be made from materials accessible for use, such as: moldable orthosis (material: metal, EVA, among others), adapters for scissors, support for books, among others. As an example, the Pencil Thickener, which is an accessory with simple and low-cost resources, to be made available in inclusive classrooms and to facilitate the grasping of pencils, pens, brushes and crayons by students with motor coordination difficulties. A simple adaptation that can be made by the teacher himself, making the difference for some students with disabilities to be able to study and learn in the classroom.

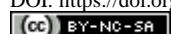
For blind students, there are speech synthesis technologies, Braille printers and scanners, programs such as DOSVOX, Virtual Vision, Jaws, NVDA, Orca and others that help to reduce the difficulties encountered, as they can perform optical character recognition, transforming the image into text, among other functions.

Therefore, the importance of the systematization of special education, the AEE and the Multifunctional Resource Room Program in the political-pedagogical project of the school is related to the possibility of this action, which in principle must be shared, to be considered an element of the construction of democracy in the environment school, favoring the construction of a school in which all students receive a positive response in their schooling process.

Matos, Souza and Oliveira (2019) reaffirm that being an inclusive school is beyond the act of inserting a child with a disability into the classroom, the physical aspects of the school must be studied and, if applicable, adapted in such a way that specificity and student access are respected, ensuring that they remain in the school environment.

Final considerations

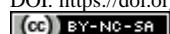
Despite little research on Accessibility and Assistive Technology in the Multifunctional Resource rooms, it appears that the studies are gaining strength as they are elements that aim to bring positive responses regarding the social and school inclusion of people with disabilities. Since they aim to break the social, architectural and pedagogical barriers, thus bringing more autonomy and quality of life to these subjects, enabling conditions of total or assisted accessibility to elements such as school furniture and equipment, which are used daily in the activities of the educational context.



In the knowledge of the pedagogical instruments proposed by accessibility and assistive technology, this study reveals that the availability and use of these school materials and adapted pedagogical resources can mean the difference between the student with disabilities being able to participate or not and learn together with the other classmates.

REFERENCES

- ALVES, A. C. de J. **A tecnologia assistiva como recurso à inclusão escolar de crianças com paralisia cerebral.** Orientadora: Thelma Simões Matsukura. 2009. 168 p. Dissertação de (Mestrado em Educação Especial). Universidade Federal de São Carlos. São Carlos: UFSCar, 2009. Available: <https://repositorio.ufscar.br/handle/ufscar/3010>. Access: 27 mar. 2020.
- BAPTISTA, C. R. Ação pedagógica e educação especial: a sala de recursos como prioridade na oferta de serviços especializados. **Revista Brasileira de Educação Especial.** Marília, v. 17, n. esp. 1, p. 59-76, maio/ago. 2011. ISSN 1413-6538. Available: http://www.scielo.br/scielo.php?pid=S1413-65382011000400006&script=sci_abstract&tlang=pt. Access: 27 mar. 2020.
- BATISTA, C. P. **Política Pública de Inclusão:** atendimento de educandos com deficiência visual no município de Manaus/AM. Orientadora: Maria Almerinda de Souza Matos. 2015. 123 f. Dissertação (Mestrado) – Universidade Federal do Amazonas – UFAM, Manaus, 2015. Available: <https://tede.ufam.edu.br/handle/tede/4878>. Access: 27 mar. 2020.
- BERSCH, R. **Design de um serviço de TA em escolas públicas.** 2009. 230 p. Dissertação de (Mestrado em design). Universidade Federal do Rio Grande do Sul. Porto Alegre 2009.
- BERSCH, R. Introdução à Tecnologia Assistiva. In: **Assistiva Tecnologia e Educação**, 2013. Available: <http://www.assistiva.com.br/tassistiva.html>. Access: 10 dez. 2013.
- BRASIL. Lei n. 13.146, de 6 de julho de 2015. Institui a Lei Brasileira de Inclusão da Pessoa com Deficiência (Estatuto da Pessoa com Deficiência). **Diário Oficial da União**, Brasília, 7 jul. 2015. Available: http://www.planalto.gov.br/ccivil_03/_ato2015-2018/lei/l13146.htm. Access: 27 mar. 2020.
- BRASIL. MEC. Decreto n. 7611, de 17 de novembro de 2011. Dispõe sobre a educação especial, o atendimento educacional especializado e dá outras providências. **Diário Oficial da União**, Brasília, DF: MEC, 18 nov. 2011. Available: http://www.planalto.gov.br/ccivil_03/_ato2011-2014/2011/decreto/d7611.htm. Access: 27 mar. 2020.
- BRASIL. MEC. **Manual de Orientação:** Programa de implementação de salas de recursos multifuncionais. Brasília, DF: MEC, 2010.
- BRASIL. MEC. **Política nacional de educação especial na perspectiva da educação inclusiva.** Brasília, DF: MEC, 2008.



BRASIL. MEC. **Resolução n. 4/2009, de 2 de outubro de 2009.** Brasília, DF: Edições Câmara, 2009.

BRUCE, C. da C. **A política de educação inclusiva:** a tecnologia assistiva como possibilidade de participação e aprendizagem de alunos com deficiência física na escola. Orientadora: Maria Almerinda de Souza Matos. 2015. 88 f. Dissertação (Mestrado em Educação) - Universidade Federal do Amazonas, Manaus, 2015. Available: <https://tede.ufam.edu.br/handle/tede/5050>. Access: 27 mar. 2020.

DAMÁZIO, M. F. M. Metodologia do serviço do atendimento educacional especializado em uma perspectiva inclusiva na escola regular. **Revista on line de Política e Gestão Educacional**, v. 22, n. esp. 2, p. 840-855, dez. 2018. ISSN 1519-9029. Available: <https://periodicos.fclar.unesp.br/rpge/article/view/11916>. Access: 27 mar. 2020.

GALVÃO FILHO, T.A. **Tecnologia Assistiva para uma escola inclusiva:** Apropriação, demandas e perspectivas. Orientadora: Theresinha Guimarães Miranda. 2009. 346 f. Tese (Doutorado em Educação) Faculdade de Educação. Universidade Federal da Bahia, 2009. Available: <http://www.repositorio.ufba.br/ri/handle/ri/10563>. Access: 27 mar. 2020.

GALVÃO FILHO. T.A. Favorecendo práticas pedagógicas inclusivas por meio da tecnologia assistiva. In: NUNES, L. R. d'O. de P.; PELOSI, M. B.; WALTER, C. C. de F. (Orgs). **Compartilhando experiências:** ampliando a comunicação alternativa. Marília: ABPEE, 2011.

GIROTO, C. R. M.; POKER, R. B.; VITTA, F. C. F. 10 anos da Política Nacional de Educação Especial na Perspectiva da Educação Inclusiva em debate: trajetória, limites e desafios. **Revista on line de Política e Gestão Educacional**, v. 22, n. esp. 2, p. 711-715, dez. 2018. ISSN 1519-9029. Available: <https://periodicos.fclar.unesp.br/rpge/article/view/11968>. Access: 27 mar. 2020.

IBGE. **Instituto Brasileiro de Geografia e Estatística.** Available: <https://cidades.ibge.gov.br/brasil/am/manaus/panorama>. Access: 19 fev 2020.

INSTITUTO DE TECNOLOGIA SOCIAL. Tecnologia Assistiva nas Escolas. **Recursos básicos de acessibilidade sociodigital para pessoas com deficiência.** Instituto de Tecnologia Social (ITS Brasil), 2008. Available: www.itsbrasil.org.br/.../Cartilha_Tecnologia_Assistiva_nas_escolas_-_Re. Access: 26 abr. 2015.

MANTOAN, M. T. E.; BAPTISTA, M. I. S. D. Inovar para fazer acontecer: como estamos fortalecendo redes de apoio à educação inclusiva. **Revista on line de Política e Gestão Educacional**, v. 22, n. esp. 2, p. 763-777, dez. 2018. ISSN 1519-9029. Available: <https://periodicos.fclar.unesp.br/rpge/article/view/11911>. Access: 27 mar. 2020.

MANZINI, E. J. Formação do professor para o uso de tecnologia assistiva. **Cadernos de Pesquisa em Educação** - PPGE/UFES. Vitória, ES. a. 9, v. 18, n. 36, p. 11-32, jul./dez. 2012. Available: <http://periodicos.ufes.br/educacao/article/view/7451>. Access: 12 jul. 2014.

MANZINI, E. J. Tecnologia assistiva para educação: recursos pedagógicos adaptados. In: **Ensaios pedagógicos:** construindo escolas inclusivas. Brasília: SEESP/MEC, 2005, p. 82-86.



MANZINI. E. J. Jogos e recursos para a comunicação e ensino na educação especial.
Marília: ABPEE, 2010.

MANZINI. E. J.; CORRÊA, P. M. Avaliação de Acessibilidade na educação infantil e no ensino superior. São Carlos: Marquezine e Manzini: ABPEE, 2014.

MATOS, M. A. de S.; SOUZA, D. B.; OLIVEIRA, J. P. de. Acessibilidade e educação infantil: o processo de inclusão do público-alvo da educação especial em Manaus/AM.

Revista Ibero-Americana de Estudos em Educação, Araraquara, v. 14, n. esp. 1, p. 760-744, abr. 2019. E-ISSN: 1982-5587. Available:

<https://periodicos.fclar.unesp.br/iberoamericana/article/view/12205>. Access: 13 fev. 2020.

NOGUEIRA, V. M. O uso da tecnologia assistiva como recurso de inclusão para alunos com deficiência dos anos iniciais do ensino fundamental da rede municipal de Manaus/AM. 2017. Relatório Final PIB-SA/0144/2016 (PIBIC) – Universidade Federal do Amazonas – UFAM, Manaus, 2017.

OLIVEIRA, C. D. de.; MILL, D. Acessibilidade, inclusão e tecnologia assistiva: um estudo bibliométrico. **Revista Ibero-Americana de Estudos em Educação**, Araraquara/SP, v. 11, n. 3, p.1169-1183, jul./set. 2016. Available:
<https://periodicos.fclar.unesp.br/iberoamericana/article/view/8194>. E-ISSN: 1982-5587.
Access: 13 fev. 2020.

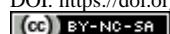
ONOHARA, A. M. H.; SANTOS CRUZ, J. A.; MARIANO, M. L. Educação inclusiva: o trabalho pedagógico do professor para com o aluno autista no ensino fundamental I. DOXA: **Revista Brasileira de Psicologia e Educação**, v. 20, n. 2, p. 289-304, jul./dez. 2018. ISSN 2594-8385. Available: <https://periodicos.fclar.unesp.br/doxa/article/view/12020>. Access: 27 mar. 2020.

ROCHA, A.N.D.C. Processo de prescrição e confecção de recursos de tecnologia assistiva na educação infantil. Orientadora: Débora Deliberato. 2010. 199 p. Dissertação de (Mestrado em Educação) Faculdade de Filosofia e Ciências, Universidade Estadual Paulista. Marília, 2010. Available: <http://hdl.handle.net/11449/91211>. Access: 27 fez. 2020.

ROCHA. A.N.D.C. Recursos e Estratégias da tecnologia assistiva a partir do ensino colaborativo entre os profissionais da saúde e da educação. Orientadora: Débora Deliberato. 2013. 210 f. Tese (Doutorado em Educação) Faculdade de Filosofia e Ciências, Universidade Estadual Paulista. Marília, 2013. Available: <http://hdl.handle.net/11449/102193>. Access: 27 mar. 2020.

SANTOS, J. O. L. dos; MATOS, M. A. de S.; SADIM, G. P. T.; SILVA, J. R. A. da; FAIANCA, M. P. Atendimento educacional especializado: reflexões sobre a demanda de alunos matriculados e a oferta de salas de recursos multifuncionais na rede municipal de Manaus-AM. **Revista Brasileira de Educação Especial**. Marília, v. 23, n. 3, p. 409-422, jul./set. 2017. Available: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1413-65382017000300409&lng=en&nrm=iso. Access: 9 jan. 2020.

SARTORETTO, M. L. Os fundamentos da Educação Inclusiva. In: **Assistiva Tecnologia e Educação**, 2014. Available: <http://www.assistiva.com.br/tassistiva.html>. Access: 01 ago. 2014.



SASSAKY, R. K. **Inclusão:** construindo uma sociedade para todos. Rio de Janeiro: WVA, 1997.

SOUZA, C. Apresentação: estado e Políticas Públicas: de que estamos falando? **Revista Eletrônica de Ciência Política**, v. 4, n. 1-2, p. 9-10, 2006. Available: <https://revistas.ufpr.br/politica/article/view/34817>. Access: 1 dez. 2014.

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