

**ASSISTIVE TECHNOLOGY IN INCLUSIVE EDUCATION**

***TECNOLOGIA ASSISTIVA NA EDUCAÇÃO INCLUSIVA***

***TECNOLOGÍA DE ASISTENCIA EN EDUCACIÓN INCLUSIVA***

Ygor CORREA<sup>1</sup>  
Tatiele Bolson MORO<sup>2</sup>  
Carla Beatris VALENTINI<sup>3</sup>  
*Organizers*

To approach Assistive Technology (AT), first, it is necessary to reflect on inclusion, and this needs actions that guarantee the intellectual, social, affective and professional development of the people to whom it is intended. In an educational context, inclusive education can be thought of as a field that addresses “education for all and with all, seeking ways and means to remove barriers to learning and to the participation of learners” (CARVALHO, 2016, p. 67). In this perspective, the author points out a number of challenges, in which is necessary to consider the uniqueness of each student. In addition, inclusive education needs to be taken as a right that is guaranteed by Brazilian educational policies (BRAZIL, 2008; 2015; 2021a; 2021b). In our country, we have completed almost three decades of commitment to inclusive education, however, we still have a long way to go. For an institution to be inclusive, it needs to account for many aspects, such as: accessibility, curricular flexibility, trained teachers, managers and technicians, differentiated pedagogical practices, among others.

In the context of special education, from the perspective of inclusive education, it is clear in Brazil that Assistive Technology (AT) is being increasingly used as a mediator in the teaching and learning process and also as an aid in the process of inclusion of students with special educational needs. AT can also be seen as an alternative to overcome barriers, promoting accessibility as well as inclusion. Decree No. 10,645, of March 2021, considers AT as an area of knowledge, which encompasses

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<sup>1</sup> University of Caxias do Sul (UCS), Caxias do Sul – RS – Brasil. Professor at the Undergraduate Course in Pedagogy PhD in Informatics in Education (UFRGS)). ORCID: <https://orcid.org/0000-0002-3526-9195>. E-mail: [correaygorprof@gmail.com](mailto:correaygorprof@gmail.com)

<sup>2</sup> University of Caxias do Sul (UCS), Caxias do Sul – RS – Brasil. Doctoral student at the Graduate Program in Education. ORCID: <https://orcid.org/0000-0002-3302-8953>. E-mail: [tati.bm@gmail.com](mailto:tati.bm@gmail.com)

<sup>3</sup> University of Caxias do Sul (UCS), Caxias do Sul – RS – Brasil. Professor of the Graduate Program in Education. PhD in Computer Science in Education (UFRGS). ORCID: <https://orcid.org/0000-0003-0355-7712>. E-mail: [cbvalent@ucs.br](mailto:cbvalent@ucs.br)

[...] products, equipment, devices, resources, methodologies, strategies, practices and services that aim to promote functionality, related to the activity and participation of people with disabilities or reduced mobility, regarding autonomy, independence, quality of life and social inclusion (BRASIL, 2021a)

In 2021, an important advance in this discussion takes place with the publication of the National Assistive Technology Plan (BRASIL, 2021b), which addresses in guideline IV on the “promotion of the insertion of assistive technology in the field of work, education, care and of social protection”. Based on this guideline, it is observed that there is an interest in promoting the use of AT in schools, with a view to students' autonomy and quality of life, beyond educational spaces. It is noteworthy that the publication of such a document, at the end of 2021, highlights the intention to promote the development and expansion of assistive technology in the lives of people with disabilities, reduced mobility and autism spectrum disorder. When it comes to the school environment, AT used by students aim to break sensory, motor or cognitive barriers that inhibit this student's access to information or make it impossible to build knowledge. For Galvão Filho (2009), AT in education goes beyond helping the student to do something, it will promote ways for the student to be and act in his development process.

In the school environment, it is important to provide a variety of methodological tools that contribute to teaching and learning. For this, ATs need to be didactic and pedagogical instruments, integrating with the teaching practice, in order to promote the autonomy of students with disabilities (CUNHA et al., 2015). In this way, ATs gain space as mediators in educational activities, providing autonomy and equal opportunities for the student, in order to build meanings, knowledge and enable individuals to relate, understand and be understood.

In the AT scenario, the transformation of methods and flexibilities increase accessibility, because according to Mainardi (2017), when one thinks about accessibility, architectural accesses soon appear, such as ramps, doors, tactile flooring, etc., but it is not only this that the term accessibility is composed of, as it encompasses the performance of quality of life, providing opportunities for learning and training, opportunities for development, work, autonomy and individual emancipation of the person with and without disabilities. In addition, Mainardi (2017) cites that accessibility is:

[...] a physical, cognitive, effective, sensorial fact [...] but above all it is a cultural fact that allows or prevents, among other things, the encounter between possible forms of writing/reading and of sensitivity that could contribute to the individual and social enrichment of sensory, motor, cognitive, affective, alternative and complementary perceptions in situations

in which inclusion becomes possible under certain conditions (MAINARDI, 2017, p. 78).

In this regard, one can think about accessibility in education, in which it is necessary to reflect on the student's life inside and outside school, involving teachers, managers, employees, family members to achieve adequate accessibility. The realization of practices that involve the sociocultural life of students with disabilities must happen beyond the classroom routine. In this way, the school space must pay attention to the needs of the student's life in environments beyond the educational one.

In this direction, the articles that make up this Dossier start from the assumption that for the development of such contexts it is necessary to develop research and discussions of theoretical and practical approaches that constitute the use of Assistive Technology in Inclusive Education. In these articles, approaches on this theme are explained through reflections, discussions and case studies that trigger different views on AT in educational processes for all, from Basic Education to higher education.

Presented by Revista Ibero-Americana de Estudos em Educação (RIAAE), this dossier includes 12 articles, in the format of theoretical essay, bibliographic review, document analysis and research reports, authored by researchers linked to national higher education institutions in different regions of Brazil: Federal University of Technology – Paraná (UTFPR), Federal Rural University of Rio de Janeiro (UFRRJ), National Institute of Health for Women, Children and Adolescents Fernandes Figueira (IFF/Fiocruz), Duque de Caxias Municipal Education System, Polytechnic Institute of Leiria, Portugal – (IPL), Federal University of Rio Grande do Sul – (UFRGS), Federal University of Piauí (UFPI), Secretary of State for Education – (SEED), Federal University of Paraná – (UFPR), University of Caxias do Sul (UCS), Federal University of São Carlos (UFSCar), São Paulo State University (UNESP), Santa Catarina State Federal Institute (IFC), Benjamin Constant Institute (IBC), Estácio de Sá University (UNESA), Midwest State University – (UNICENTRO), Federal University of Bahia (UFBA), University of São Paulo (USP), Uniguairacá University Center, Western São Paulo State University (UNOESTE),

Thus, the initial discussion on “Assistive Technologies for Communication and Participation of Children with Congenital Zika Virus Syndrome” by Marcia Denise Pletsch, Miriam Ribeiro Calheiros de Sá, Máira Gomes de Souza da Rocha, presents the results of a research on the use of AT for the communication of children with multiple disabilities who are not oralized as a result of the Congenital Zika Virus Syndrome (SCZV). The conceptions of education professionals who worked with these children in the years 2019 and 2020 were

addressed; the results of this research showed, among other aspects, that using assistive technology resources favors the promotion of communication and, consequently, participation, and also the schooling of these children, provided that the necessary support is offered, either at home or in the school.

The article developed by researchers from two countries “Inclusive Practices in Context: accessible communication actions in Portugal and Brazil”, written by Eduardo Cardoso, Alessandra Lopes de Oliveira Castellini and Célia Maria Adão de Oliveira Aguiar Sousa, discusses inclusive practices of accessible communication regarding the guidance and prevention of health care in the context of the COVID-19 pandemic, carried out in projects that take place in Portugal and Brazil. From the Universal Design for Learning, communication boards and educational materials are produced, articulating studies in different areas to make communication more accessible and favor health care in times of a pandemic. They carry out a literature review to develop the discussion of the results from the bibliography, legislation and practices developed.

The analysis presented in the article “Assistive Technologies in Mathematics Teaching and Learning for Blind Students: investigating the presence of universal design and universal design for learning”, by Sandra Maria Ferreira Jeremias, Anderson Roges Teixeira Góes, Sonia Maria Chaves Haracemiv, addresses AT in the teaching and learning of mathematics aimed at blind students, through a systematic and integrative review in different search sites. For that, they observed if the studied resources are conceived by Universal Design (UD) and by the methodologies indicated in the researches that have a Universal Design for Learning (UDL) approach. The results showed the existence of few researches in the UDL approach, but the practices that make use of the UDL allow the blind student to participate effectively, with equity, in inclusive educational processes in the classroom environment.

The article “Assistive Technology and School Inclusion: Mediation and Autonomy in Question”, by Cláudia Alquati Bisol and Carla Beatris Valentini, analyzes and discusses two cases of mediation in the use of AT. The authors found that its use enhances learning and the constitution of autonomy in students with disabilities. Through the use of the field diary constructed during meetings at school and school records as sources of data, the authors were able to verify how the child appropriates AT, how it means their daily experiences and how their relationship with objects is constituted. and with others, which can enable movements of autonomy. However, the authors observe that this depends on the mediation in the interaction with culturally created elements and with social subjects.

The authors Amália Rebouças de Paiva e Oliveira, Adriana Garcia Gonçalves, Lígia Maria Presumido Bracciali present a theoretical discussion in the text entitled “Universal Design for Learning and Assistive Technology: complementary or exclusive?”. The discussion is guided by the principles of UDL and AT, presenting what the literature has addressed, and as a result the authors point out that the two perspectives are complementary, as it aims to favor the processes of educational inclusion.

The research “Teachers Social Representations about the concepts of Disability and Assistive Technology”, carried out by the authors Tatiele Bolson Moro, Ygor Corrêa, Valdinei Marcolla and Cristiane Backes Welter presents the investigation of the types of disabilities and the types of AT present in Caxias do Sul campus. The authors analyzed the narratives, as social representations, about Disability and AT, based on an interview with teachers. It was, therefore, observed that most respondents attribute the concept of disability to the Medical Model and make little mention of the use of AT.

The analysis carried out by Thiago Sardenberg and Helenice Maia in the article “Information and Communication Technology and Assistive Technology: approaches and distances” shows how these terms, ICT and AT, were used in the main national and international documents on the subject of inclusive education. The authors observe that there is a complex overlap between the two modalities of technology, with both being widely used.

The authors Eliziane de Fátima Alvaristo and Jamile Santinello carried out the study entitled "The Contributions of Dosvox Assistive Technology for Teachers in Initial Training: intermediating inclusive technological practices", in which they describe a case study in a Public Institution of Higher Education in the interior of Paraná. , with twenty-six teachers of initial formation in Pedagogy, one of them being blind. The researchers used several instruments for the building up data, one of them being a practical intervention on the use of Assistive Technology - Dosvox. They observed that the use of AT - Dosvox contributed to the recognition of new conceptions about the teaching and learning process among teachers in training, and was a way of developing, with the group, discussions on the context of inclusive education for people with sight disabilities.

The article “Training Program for the use of Alternative Writing: a case study with a young person with cerebral palsy” by Jéssica Rodrigues Santos and Gerusa Ferreira Lourenço presents a research that develops and evaluates an intervention program with young people who have Cerebral Palsy and the possibility of using an Assistive Technology resource for alternative writing. The study carried out an experiment with a boy who used alternative writing computational resources. To check the learning, the authors used the aids of: Verbal Guidance,

Demonstration, Gesture Tip and Physical Help. The research showed positive results to the program application procedures and the teaching was effective in achieving the participant's autonomy in relation to alternative writing on the computer.

The authors Fernanda Matrigani Mercado Gutierrez de Queiroz and Márcia Helena da Silva Melo present a study carried out on the role of support professionals or caregivers as mediators of AT for students with multiple disabilities or who have a greater commitment profile. The study entitled "Support Professional as a Mediator of Assistive Technology in the School Environment" discusses the theme through the application of questionnaires carried out with a group of caregivers who worked in elementary schools and focus groups. Data were analyzed from categories that emerged during the research.

The study "Kubai, the Enchanted and the Tangible Table", developed by Raquel de Cássia Rodrigues Ramos, Cláudia Rodrigues de Freitas, Sheyla Werner, addresses the development of AT in the inclusive educational context to tell the story Kubai the Enchanted through the Table with Tangible Interaction. The authors produced tactile and three-dimensional images in order to promote tactile accessibility, presenting the story in an inclusive way. The research also involved the study of indigenous children's stories based on contemporary authors. As a result, the authors showed the possibility of creating support in a tangible table device from stories inspired by the indigenous mythology of the Kubeo culture.

The research carried out by Lucia Virginia Mamcasz-Viginheski, Elsa Midori Shimazaki and Sani de Carvalho Rutz da Silva and entitled "The Golden Soroban as a mediating instrument for conceptual appropriation in intellectual disability" brings the discussion about the Golden Soroban didactic material, as a tool for assist the teaching of students with intellectual disabilities. The tool was used with students who attended the Youth and Adult Education program at a special education school. At the end of the intervention, it was revealed that the use of Golden Soroban promoted students' understanding of the structure of soroban, the understanding of the principles of the decimal number system such as place value, groupings of ten in ten and the learning of mathematical concepts related to numbers and operations. As a result, the authors point out the importance of considering the abilities of students with disabilities, so that they can learn and develop, based on the conditions given in the teaching process.

We believe that this dossier can contribute to (re)think the various practices made possible by the mediation provided by AT, from a social, educational and professional point of view, in order to improve the production of knowledge aimed at the inclusion of all who benefit from it. your use. It should also be noted that it is extremely important to continue research in

the area of inclusive education, especially in the field of AT, so that we can advance academically in this area, in order to resist possible setbacks unrelated to Brazilian science. We wish you a good read!

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