

## Teaching mathematics to students with intellectual disabilities: a systematic literature review

### ARTICLE

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### Abstract

The inclusion of students with Intellectual Disabilities in Mathematics teaching presents challenges that demand effective pedagogical practices. The objective of this study is to analyze pedagogical practices in teaching Mathematics to students with ID. The methodology adopted was a Systematic Review, through the *Methodi Ordinatio*, covering the period from 2018 to 2023. The Web of Science, Scopus, Science Direct and SciELO databases were consulted, using the descriptors "Mathematics", "Intellectual Disability" and "Special Education". The results indicated that inclusive pedagogical practices, such as the use of concrete materials, games and educational software, are effective in teaching and learning these students. However, challenges such as scarcity of resources, need for curricular adaptation, effective legislation and continuous professional development of teachers were highlighted. It is necessary to invest in continuing education, ensure access to adequate resources and promote inclusive educational environments that provide all students with opportunities for meaningful learning in Mathematics.

**Keywords:** Intellectual Disability. Special Education. Mathematics. *Methodi Ordinatio*.

### O ensino da matemática para alunos com deficiência intelectual: uma revisão sistemática de literatura

### Resumo

A inclusão de alunos com Deficiência Intelectual no ensino de Matemática apresenta desafios que demandam práticas pedagógicas eficazes. O objetivo desse estudo é analisar as práticas pedagógicas no ensino da Matemática para alunos com DI. A metodologia adotada foi de uma Revisão Sistemática, por meio do *Methodi Ordinatio*, abrangendo o período de 2018 a 2023. Foram consultadas as bases *Web of Science*, *Scopus*, *Science Direct* e *SciELO*, utilizando os descritores "Mathematics", "Intellectual Disability" e "Special Education". Os resultados indicaram que as práticas pedagógicas inclusivas, como uso de

materiais concretos, jogos e *softwares* educacionais, são eficazes no ensino e aprendizagem desses alunos. Entretanto, desafios como escassez de recursos, necessidade de adaptação curricular, legislações efetivas e desenvolvimento profissional contínuo dos professores foram destacados. É necessário investir na formação continuada, garantir acesso a recursos adequados e promover ambientes educacionais inclusivos que possibilitem a todos os alunos oportunidades de aprendizado significativo em Matemática.

**Palavras-chave:** Deficiência Intelectual. Educação Especial. Matemática. *Methodi Ordinatio*.

## 1 Introduction

The teaching of Mathematics to students with Intellectual Disability (ID) represents a challenge for teachers working in both public and private education, in schools and universities alike. This scenario requires inclusive pedagogical approaches that address students' needs and foster the development of their skills. The complexity of this teaching and learning process is evidenced by the various challenges identified by researchers and professionals in the field, especially by mathematics teachers. Authors such as Tan *et al.* (2019) highlight the need for access to adapted resources, curricular adaptation, and instructional differentiation to meet the specificities of these students. On the other hand, Schnepel and Aunio (2022) emphasize that students with ID have different learning levels, making the adaptation of pedagogical practices a challenging task.

The American Psychiatric Association – APA (2013) defines ID as the presence of deficits in general cognitive skills, including reasoning, problem-solving, planning, abstract thinking, judgment, and academic learning. Consequently, individuals with ID may face greater difficulties in learning Mathematics.

The inclusion of students with ID in mathematics education requires more than the transmission of content; it demands the construction of meaningful knowledge. Considering the different learning styles and the specific challenges that may affect the understanding of mathematical concepts, it is essential that teachers are prepared to adopt differentiated and personalized strategies. Such an approach not only enhances learning but also

contributes to fostering autonomy and self-esteem among students with ID, promoting their active participation in the school environment.

Takinaga and Manrique (2023) emphasize the importance of curriculum adaptation, collaboration with support professionals, and access to resources and assistance. These issues gain further prominence in the research by Moura *et al.* (2023), who point out the need for integrated strategies and holistic approaches to overcome the challenges in teaching Mathematics to students with ID. The lack of adequate teacher training, combined with the scarcity of resources and the need for curricular adaptation, raises concerns about the limitations of Mathematics teaching for students with ID. These students are often exposed to a functionalist type of teaching focused solely on basic skills, without encouraging the development of broader mathematical thinking (David *et al.*; Lindström *et al.*, 2023).

Hord, Duppstadt and Pescatrice (2021) and Wilson and Hunt (2022) highlight the lack of resources within schools for students with disabilities and the prejudice they suffer from peers, while Cox and Jimenez (2020) point out the lack of teacher preparation and the limited availability of diversified learning opportunities—not only for these students, but also for the rest of the class they belong to. Furthermore, Bouck, Park and Shurr (2021) emphasize the need to address difficulties related to working memory in students with ID, since their cognitive characteristics entail distinct challenges and needs, underlining the importance of strategies that promote information retention and retrieval. In light of these perspectives, Sateler *et al.* (2021) stress the lack of resources and adequate training, demonstrating the necessity of adapting activities and materials to meet students' individual needs.

Beyond these barriers, there is also a significant cultural challenge: resistance to inclusion in some educational settings, where teachers and administrators often lack the necessary support to handle diversity in learning. This context calls for a deeper look at public policies, specific training programs, and the sharing of best practices. Mathematics, as a core discipline in basic education, requires methodologies that ensure the

comprehension of essential concepts for everyday life, such as basic operations, logical reasoning, and problem-solving.

Based on these considerations, this study seeks to investigate how the challenges faced by educators in implementing inclusive pedagogical practices in the teaching of Mathematics to students with ID can be understood and applied, recognizing the importance of effective strategies, continuing education, and collaboration among education professionals. Understanding these challenges is fundamental to developing more efficient and inclusive approaches, ensuring that every student—regardless of their abilities—can experience meaningful mathematical education.

## 2 Methodology

This study is characterized as a systematic literature review. It constitutes a research modality based on existing literature about a specific topic, applying standardized methods for searching, critically evaluating, and synthesizing relevant information. This approach is particularly effective for gathering evidence on specific interventions, interpreting conflicting results among studies, and identifying gaps that may guide future research (Sampaio; Mancini, 2007).

To construct the research corpus, the *Methodi Ordinatio* was employed with the purpose of systematizing the selection of scientific articles, using the journal impact factor, year of publication, and number of citations as criteria to indicate the scientific relevance of studies for a given investigation (Pagani; Kovalski; Resende, 2017). The application of the method occurred in nine stages:

In the first stage, establishment of the research intention, descriptors and the most appropriate combinations were identified to address the following question: *Which pedagogical practices are most effective in teaching Mathematics to students with Intellectual Disability (ID), and what challenges do teachers face in their implementation?*

In the second stage, exploratory research using the descriptors in databases, the descriptors and combinations identified in stage one were tested in the databases *Web of*

*Science*, *Scopus*, *Science Direct*, and *SciELO*. In this stage, the software *Mendeley* was used to remove duplicate articles.

In the third stage, definition of the combination of descriptors and databases to be used, the databases tested in stage two were approved for presenting a significant volume of publications containing the researched descriptors and for offering broad accessibility to published materials. The final search string was defined as: “Mathematics” AND “Intellectual Disability” AND “Special Education.” The search period considered was five years (between January 1, 2018, and November 29, 2023).

In the fourth stage, the definitive search in the databases resulted in a gross total of 156 articles (*Science Direct* – n=103; *Scopus* – n=38; *Web of Science* – n=6; *SciELO* – n=9). The result was deemed satisfactory, with no need to expand the number of databases. The software *Mendeley* was used as a reference manager for data collection and storage.

In the fifth stage, filtering procedures were carried out, eliminating duplicate works, conference papers without impact factors, books or book chapters, and titles that did not align with the theme of this study. In this step, *Mendeley* and *JabRef* were used sequentially to build the portfolio. After applying the filtering procedures, 16 articles were selected.

In the sixth stage, the impact factor, year of publication, and number of citations were identified. For this purpose, the *RankIn* spreadsheet, provided by the authors of the *Methodi Ordinatio*, was used to identify the impact factor of the publications (*last year JCR* or *SJR*). The number of citations was obtained from *Google Scholar* (<http://scholar.google.com>) on December 15, 2023, using the links provided in the *RankIn* spreadsheet.

In the seventh stage, the articles were ranked using *InOrdinatio* through the application of the *InOrdinatio* equation (Pagani; Kovalesski; Resende, 2015):

## Box 1 - *InOrdinatio* equation for article ranking

$$InOrdinatio = (Fi / 1000) + (\alpha^*(10 - (YearSearch - YearPub))) + (\sum Ci)$$

Where:

Fi = journal impact factor;  $\alpha^*$  = coefficient assigned by the researcher to the relevance of the publication year, ranging from 1 to 10; YearSearch = year in which the database search was conducted; YearPub = year of article publication;  $\sum Ci$  = number of article citations.

Source: Pagani; Kovalski; Resende (2015).

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In this research, the value assigned to  $\alpha$  was 10, considering that the recency of the articles is paramount.

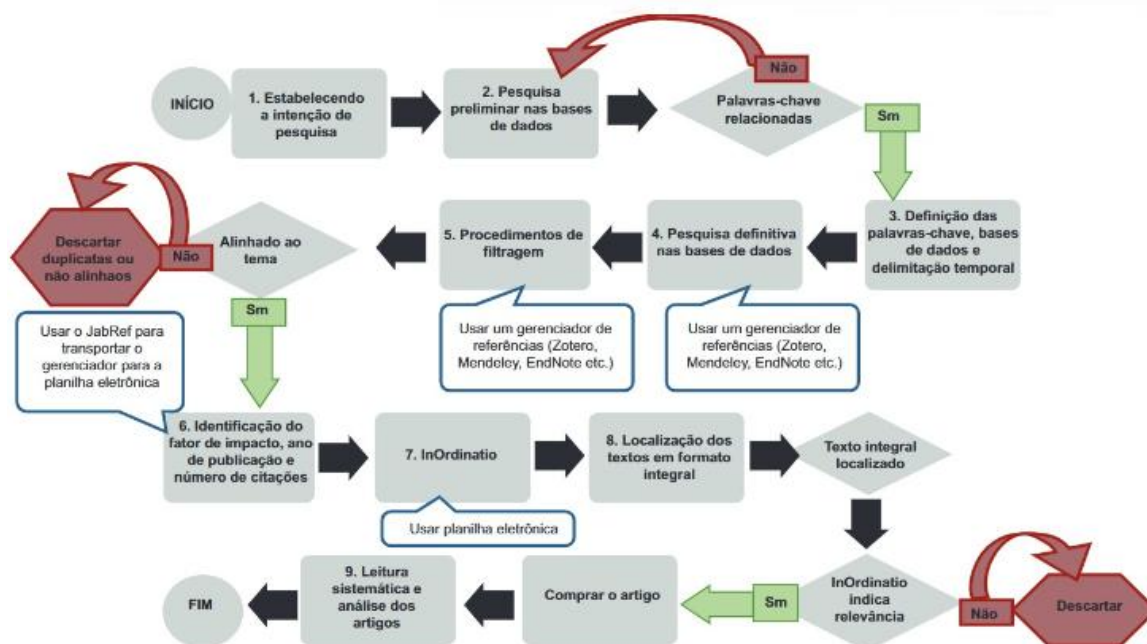
In the eighth stage, the retrieval of the full-text articles was carried out directly on the journal websites through the *Portal de Periódicos da Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – CAPES* (*Portal of Journals of the Coordination for the Improvement of Higher Education Personnel – CAPES*), using CAFE access credentials.

In the ninth stage, reading and systematic analysis of the articles, the selected papers were read in full. Articles that did not provide elements to answer the research question were excluded after reading. To avoid saturation, the composition of the documentary corpus was limited to a maximum of 30 articles that showed positive results in the *InOrdinatio* equation.

The stages are presented synoptically in Figure 1.



Figure 1 – Stages of the *Methodi Ordinatio* and the use of ICTs in each stage



Source: Adapted from Pagani; Kovaleski; Resende, 2015.

### 3 Results and Discussion

The following table presents a list of selected articles on the teaching of Mathematics to students with Intellectual Disability (ID), using the *Methodi Ordinatio*.

Table 1 – Final selection of articles on the teaching of Mathematics to students with Intellectual Disability (ID) after ranking through the *InOrdinatio*

Ranking	Authors	Citation	Impact Factor	Year	InOrdinatio
1	Tan <i>et al.</i> ,	60		2019	120
2	Schnepel, Aunio.	18	2,082	2022	108,00208
3	Takinaga, Manrique.	1		2023	101
4	Moura <i>et al.</i> ,	1		2023	101
5	Lindström <i>et al.</i> ,	0	3,23	2023	100,00323
6	David <i>et al.</i> ,	0		2023	100
7	Wilson, Hunt.	6		2022	96
8	Hord, Dupstadt, Pescatrice.	10	2,049	2021	90,002049

Ranking	Authors	Citation	Impact Factor	Year	InOrdinatio
9	Park, Bouck, Josol.	18	3,23	2020	88,00323
10	Bouck, Park, Shurr.	7	0,973	2021	87,000973
11	Sateler <i>et al.</i> ,	7	0,5	2021	87,0005
12	Cox, Jimenez.	11	3,23	2020	81,00323
13	Bouck, Long.	4	3,23	2020	74,00323
14	Kleemans, Segers, Verhoeven.	23	3,719	2018	73,003719
15	Viginheski <i>et al.</i> ,	0		2020	70
16	Mojica	3		2018	53

Source: Author's own (2023).

Next, a box was developed to synthesize the main ideas, highlighting the authors, objectives, population/sample, and the results of each article.



## Box 2 - Research Corpus

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Author (year)	Title	Objectives	Population/Sample	Results
Tan <i>et al.</i> , (2019).	A disability studies in mathematics education review of intellectual disabilities: Directions for future inquiry and practice.	Conduct a critical review of research in mathematics education for students with Intellectual Disability (ID), interpreting focuses and paradigms in recent studies.	The sample includes studies from mathematics education journals, focusing on teaching students with ID.	Research in mathematics for students with ID often lacks a social focus. Support is shown for inclusive and meaningful practices.
Schnepel, Aunio (2022).	A systematic review of mathematics interventions for primary school students with intellectual disabilities.	Identify characteristics of effective mathematical interventions for students with ID, focusing on numerical skills and arithmetic problem-solving.	Twenty studies conducted between 2008 and 2020, with a total sample of 135 students with ID.	Students with ID acquire numerical skills and arithmetic problem-solving abilities through structured and effective instructional approaches.
Takinaga, Manrique (2023).	O uso da tecnologia e suas contribuições para a formação integral do aluno com Transtorno do Espectro Autista e do aluno com Deficiência Intelectual nas aulas de Matemática.	Present the favorable contributions of technology to the holistic development of students with Autism Spectrum Disorder (ASD) and ID in mathematics classes.	Not reported.	Highlights the importance of technology in inclusion and holistic development of students with special needs in mathematics classes, emphasizing adequate teacher training.
Moura <i>et al.</i> (2023).	Trajetória educacional de estudantes com autismo e Deficiência Intelectual: avaliação de leitura, escrita, matemática e comportamento verbal.	Address pedagogical practices used in teaching Mathematics to students with ID and autism.	Four students with ID and autism.	Despite advances in inclusion, it is crucial to expand samples, address teachers' perceptions, and prioritize Specialized Educational Support (SES) to ensure effective learning.

Author (year)	Title	Objectives	Population/Sample	Results
Lindström <i>et al.</i> (2023).	An observation study of mathematics instruction for students with IDD in grades K-2.	Describe number instruction in Mathematics for elementary school students with ID.	Six special education teachers teaching students with ID in five different schools.	Teachers apply practices aligned with research, highlighting opportunities for improvement. Interventions, professional development, and classroom practice are essential.
David <i>et al.</i> (2023).	Factors That Support Technology Integration Practices in the Math Education of Children with Intellectual Disabilities.	Describe the teaching practices of a special education teacher in 7th grade who emphasized the use of visual representations, such as diagrams and gestures, in her instructional approach.	Two 7th-grade students with mild ID.	Students with ID have the potential to access and succeed in more advanced levels of Mathematics, provided they receive adequate support, such as strategic use of visual representations and gestures, and are given time and space for critical thinking.
Wilson, Hunt (2022).	Marginalized within the margins: Supporting mathematics meaning making among students with learning disabilities.	Investigate the role of home numeracy experiences in predicting differences, as well as the influence of cognitive and linguistic factors.	200 children, 100 diagnosed with Language Development Disorder (LDD) and 100 in a control group.	Home numeracy experiences play a significant role in predicting children's basic arithmetic skills, particularly regarding arithmetic problem size.
Hord, Duppsadt, Pescatrice (2021).	Access to seventh grade mathematics: A case study of two students with mild intellectual disability.	Describe a qualitative case study investigating access of students with ID to 7th-grade Mathematics education.	Students with ID attending 7th grade in an inclusive educational setting.	Highlights the importance of pedagogical practices that emphasize strategic use of visual representations, such as gestures and diagrams, to support the success of students with ID in Mathematics learning.

Author (year)	Title	Objectives	Population/Sample	Results
Park, Bouck, Josol (2020).	Maintenance in Mathematics for Individuals with Intellectual Disability: A Systematic Review of Literature.	Review studies involving the teaching of Mathematics to individuals with ID.	Not specified.	Emphasizes the importance of addressing both acquisition and maintenance of mathematical skills in individuals with ID to promote effective and lasting learning.
Bouck, Park, Shurr (2021).	Teaching students with intellectual and developmental disabilities to calculate cost after discounts via schematic diagrams.	Explore the effectiveness of Virtual-Representational-Abstract (VRA) instructional sequences to support the acquisition and maintenance of mathematical skills in students with ID.	Students with ID.	VRA instructional sequences support skill acquisition, while also emphasizing the need to address maintenance of these skills over time.
Sateler <i>et al.</i> (2021).	Opportunities to Learn Mathematics for Students with Intellectual Disability in Special Education Schools.	Characterize learning opportunities for students with ID in special schools in Chile.	Students with ID in eight special schools of early basic cycle across three Chilean cities.	Students in special schools have limited opportunities to access diverse mathematical concepts and develop complex skills through rich and challenging tasks, limiting participation and personal development.
Cox, Jimenez (2020).	Mathematical interventions for students with autism spectrum disorder: Recommendations for practitioners.	Provide recommendations for professionals working with students with extensive support needs.	Students with extensive support needs, i.e., those with ASD, ID, or both conditions.	Highlights the importance of selecting appropriate instructional practices for diverse groups and provides evidence-based recommendations to meet needs of heterogeneous student populations in inclusive classrooms.

Author (year)	Title	Objectives	Population/Sample	Results
Bouck, Long (2020).	Using the virtual-representational instructional sequence to support the acquisition and maintenance of mathematics for students with intellectual disability.	Explore the effectiveness of a schema-based intervention using a least prompts system to teach students with ID to calculate the cost of an item after a discount.	Three high school students with ID.	The schema-based intervention with a least prompts system was effective in teaching students to calculate discounted item costs, and students were able to generalize these skills to real-world problems.
Kleemans, Segers, Verhoeven (2018).	Quarterly Individual differences in basic arithmetic skills in children with and without developmental language disorder: Role of home numeracy experiences.	Examine the influence of home numeracy experiences on the development of arithmetic skills in children with and without LDD.	Not specified.	Home numeracy factors are related to second-grade arithmetic with large problems, but not small ones. This finding has implications for both home and school environments.
Viginheski <i>et al.</i> (2020).	Formation of mathematical concepts by the intellectually disabled by means of soroban.	Investigate the use of the soroban as a tool for developing mathematical concepts in individuals with ID.	Eight adult students, aged 19–47, attending a special education school in Paraná, Brazil.	The soroban was effective in developing mathematical reasoning, understanding numerical concepts, and enhancing mathematical skills of students.
Mojica (2018).	Understanding the probability at young with intellectual disability.	Establish a reference framework to enable special education teachers to plan activities for teaching stochastic concepts (probability and statistics) in a classroom with heterogeneous abilities.	Three adolescents (15–17 years) with ID in the 3rd grade of special secondary education.	Results reveal students' understanding of probability measures, sample space, and random variables after instruction, as well as their use of compensatory schemes related to probabilistic thinking.

Source: Author's own (2023).

The teaching of Mathematics to students with Intellectual Disability (ID) has been the subject of various pedagogical approaches adopted by educators, aiming to ensure learning opportunities and promote the inclusion of all students in the classroom. Among these approaches, *Direct Instruction* stands out as a pedagogical method characterized by clarity and explicitness in the transmission of information, using structured and sequential methods. It seeks to provide effective instruction, marked by the direct presentation of concepts followed by guided practice and immediate feedback. Another relevant approach is *computer-based instruction*, which employs software programs to teach specific mathematical skills (Tan *et al.*, 2019; Schnepel; Aunio, 2022). Strategies such as *simultaneous prompting* offer immediate cues to assist in completing mathematical tasks, allowing the teacher to provide hints and instructions that meet the specific needs of each student or group, thus ensuring opportunities for meaningful learning. *Video modeling* instruction, in turn, focuses on creating content that is clear, engaging, and capable of conveying complex concepts in an understandable way (David *et al.*, 2023; Moura *et al.*, 2023).

*Tactile-based teaching* and *counting strategies* help students in everyday tasks such as shopping, handling money, spatial orientation, time management, autonomy in daily activities, and the development of fine motor coordination (Hord; Duppsstadt; Pescatrice, 2021; Mojica, 2018).

The inclusive perspective in mathematics education, emphasized by Takinaga and Manrique (2023), highlights the importance of providing learning opportunities for all students, regardless of their abilities or disabilities, while carefully considering the number and duration of intervention sessions conducted by the teacher and student. Furthermore, implementing various didactic-pedagogical approaches requires recognizing the particularities of each student in the process of constructing knowledge.

Current practices stand out for the use of concrete materials, multisensory teaching, and curriculum adaptation to meet the individual needs of students (Moura *et al.*, 2023). The incorporation of *assistive technology*, such as educational software, is another strategy that aims to support the teaching and learning of mathematical concepts (Moura

*et al.*, 2023). Additionally, studies address the relevance of arithmetic and intelligence markers, as well as the relationship between working memory and mathematical achievement (Stock *et al.*, 2009; De Smedt *et al.*, 2009).

The use of the *soroban* is cited as an effective tool for teaching mathematical concepts, according to authors who conducted a study on the formation of mathematical concepts by individuals with ID through the use of the soroban. The participants initially had limited knowledge of numbers and operations, but after a pedagogical intervention involving its use, they showed progress in their understanding and skills. This suggests that the use of concrete resources can be an effective way to internalize mathematical concepts, enabling students to grasp the meaning of operations. The authors argue that the soroban not only facilitates the learning of mathematical content but also contributes to the development of higher psychological functions, such as memory, reasoning, and attention (Viginheski *et al.*, 2020).

Educators face several challenges when implementing inclusive pedagogical practices for teaching Mathematics to students with ID. A fundamental challenge is access to adequate resources, as evidenced by Tan *et al.* (2019) and Wilson and Hunt (2022). Curriculum adaptation is also highlighted as a significant barrier by various authors, including Schnepel and Aunio (2022), Takinaga and Manrique (2023), and Hord, Duppsstadt, and Pescatrice (2021). *Instructional differentiation* is a central issue, as educators must adjust their practices to address the diverse abilities and learning styles of students with ID, as mentioned by Moura *et al.* (2023) and Lindström *et al.* (2023).

Individualized support—including additional time, specialized learning assistance, and assessment adaptations—emerges as a logistical challenge, as noted by Tan *et al.* (2019) and Schnepel and Aunio (2022). Overcoming negative attitudes and expectations regarding the abilities of these students is considered fundamental to promoting an inclusive and supportive environment, as emphasized by Lindström *et al.* (2023).

For an inclusive environment, investing in professional development is essential. Tan *et al.* (2019) and Takinaga and Manrique (2023) highlight the need for continuous training to equip teachers for the implementation of inclusive pedagogical practices.



Research emphasizes the importance of teachers' technical knowledge and beliefs regarding technology, arguing that professional development should be tailored to enhance these areas and, consequently, improve the quality of Mathematics teaching in special education classrooms. This approach can lead to more effective and personalized teaching practices, significantly benefiting students with Intellectual Disability (ID) (David *et al.*, 2023).

Furthermore, collaboration with other professionals, such as occupational therapists and speech-language pathologists, is emphasized as essential for developing complementary approaches aimed at students' holistic development (Moura *et al.*, 2023). This interdisciplinary cooperation allows pedagogical strategies to be adapted to the specific needs of students with ID, providing comprehensive support that extends beyond Mathematics instruction to the development of cognitive, motor, and communication skills.

Occupational therapists, for example, can assist in adapting instructional materials and designing activities that foster fine motor coordination, facilitating the use of mathematical manipulatives and technological tools. Speech-language pathologists play a crucial role in promoting communication and language skills, which directly influence students' understanding of mathematical concepts and their active participation in class.

This integrated approach strengthens Mathematics instruction by creating a more accessible and inclusive environment, where students can explore different learning modalities. The involvement of multiple professionals allows for the implementation of differentiated methodologies, such as the use of visual representations, tactile materials, and digital resources adapted to each student's abilities. In this way, Mathematics ceases to be viewed solely as an academic challenge and is taught more meaningfully, promoting autonomy and active participation throughout the teaching and learning process.

## 4 Final Considerations

In this study, a systematic literature review was conducted with a focus on teaching Mathematics to students with Intellectual Disability (ID). The aim was to analyze

pedagogical practices in Mathematics education for students with ID. A systematic method was employed to collect articles related to the investigated topic.

The study found that the implementation of inclusive pedagogical practices in Mathematics teaching for students with ID requires a comprehensive approach focused on overcoming multidimensional challenges. Educators face obstacles ranging from scarcity of resources and the need for curriculum adaptation to promoting positive attitudes and high expectations for students throughout the teaching and learning process. Nevertheless, the practices employed by teachers proved effective in supporting students' learning by creating and utilizing concrete materials, such as the soroban, logic games, educational software, and available teaching tools. By fostering more welcoming and accessible school environments for all students, regardless of their cognitive abilities, an inclusive school emerges. In this regard, legislation supporting educational inclusion plays a crucial role, providing guidelines and support to ensure equitable access to education for all students.

Furthermore, an essential aspect for advancing inclusion in Mathematics teaching is the development of pedagogical materials that address the diverse learning styles of students with ID. Visual resources, interactive activities, and strategies grounded in students' daily experiences can significantly contribute to the assimilation of mathematical concepts. Another important factor is family engagement in the educational process. School-family partnerships promote learning progress, as students feel more motivated and supported in their academic journey.

It is important to emphasize that transforming Mathematics instruction for students with ID is grounded in a collective commitment involving the entire school community, from administrators to family members and other professionals who support inclusive education. The path to a truly accessible school involves the implementation of effective public policies, investment in continuous professional development, and the creation of an educational environment that values diversity as an enriching element for all participants.

In this context, it is necessary to invest in ongoing professional development, access to adequate resources, and interdisciplinary collaboration to create inclusive

educational environments where each student, regardless of their needs, can access meaningful learning opportunities and achieve their full potential in Mathematics education.

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