

# International Journal of Human Sciences Research

Acceptance date: 18/10/2024

## PEDAGOGICAL STRATEGIES FOR TEACHING AND LEARNING SCIENCE TO STUDENTS WITH INTELLECTUAL DISABILITIES: JOSÉ CASE

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**Abstract:** One of the biggest challenges facing public schools today is to provide an inclusive and pluralistic environment, in which training paths have new intentions, based on the demands of the students, demystifying the production of a mechanical curriculum that strengthens inequalities. In view of the above, the aim of this paper is to report on pedagogical practices emerging in everyday school life, capable of promoting the inclusion of students with intellectual disabilities. The teaching experience took place in a municipal school in Maricá/RJ, in a 6th grade class. In this class, which was going through a transition between the primary and secondary school segments, there was a student, José, with an intellectual disability, who was 16 years old. The student was apathetic towards science lessons, which is why the aim was to reflect on the production of the IEP, as a plan for promoting an individualized educational process, through meetings between the agents involved in the process and case studies. The methodology used was action research, which included stages of diagnosis, intervention and evaluation, enabling a parallel with the procedural construction of the IEP. With the collaborative proposal, it was observed that in addition to understanding how to work from an inclusive perspective, there was encouragement regarding choices so that individualized work could take place in an atmosphere that was welcoming of differences and respectful of diversity.

**Keywords:** Individualized Education Plan; Science Teaching; Intellectual Disability.

## INTRODUCTION

Over the years, Special Education from an inclusive perspective has made substantial progress in terms of official guidelines based on various laws that have guaranteed the inclusion of students with disabilities or disorders in mainstream education. However, the inclusion of students with disabilities represents both a challenge and an opportunity to develop innovative and inclusive teaching practices, contributing to a society that values diversity.

As a source of promoting a quality inclusive process that is accessible to all, the National Policy for Education from an Inclusive Perspective (Brazil, 2008) and the Operational Guidelines for Specialized Educational Assistance in Basic Education, Special Education modality (Brazil, 2009) established, among other aspects, that inclusion should take place at all levels of education, from Early Childhood Education to Higher Education. It's worth noting that collaborative work with multi-professionals, such as the Multifunctional Resource Room (SRM), favors the development of emotional and social skills, as well as the daily practices necessary for life.

In this context, the purpose of this report is to understand and analyze the links between science teaching and pedagogical practices aimed at inclusive education. To this end, we started with a case study that analyzed the experiences of a 16-year-old student, José, who has an intellectual disability and is in the 6th grade at a school located in the municipality of Maricá/RJ, as well as those of teachers and other members of the school community, such as the educational inclusion agent.

The research scenario must be described in order to elucidate the formation of the school space as a source of resistance for groups that have remained on the margins of society for years and, above all, of school inclusion, and who are now seeing their rights guaranteed. That said, the municipality's education system

has an educational inclusion agent for all students who are the target of Special Education<sup>1</sup>, a Multifunctional Resource Room in several schools, so that students can be cared for during the school day, multi-professional reception staff at the school, such as a psychologist, social worker, nursing technician and psychopedagogue, as well as partnerships with various multidisciplinary care centers.

The individualization processes take place through the Individualized Educational Plan (IEP), a document that guides the work of teachers, which aims to propose, plan and monitor the learning and development process of students with disabilities, whose basis should be the individual trajectory of students in Special Education. The IEP must contain all the student's potential, challenges to be overcome, barriers that present themselves, as well as educational strategies that can serve to engage and make assessments more accessible. This educational planning should also include priority objectives and goals to be developed over a certain period, requiring revision after the stipulated time. Based on collaborative work, the IEP should be planned jointly, starting with the teacher, and involving the specialist teacher, other professionals who assist the student, the family and the student themselves, when possible.

However, despite the many services and the fact that the laws have been put into effect, there are still several obstacles to the educational inclusion of people with disabilities, such as the need for teacher training on the subject and the development of specific and individualized work for this public, with a view to meeting their needs. These are some of the many other problems that are evident in the daily life of many Brazilian schools, as Glat and Pletsch (2013) point out and which were part of this research.

Therefore, according to the teachers' reports, student José had difficulties in starting

and concentrating on the proposed activities, as well as challenges in carrying out collective activities and relating to his peers. The class in which he is most agitated occurs at the end of the day. The educational inclusion agent reported that one of the possible reasons why the student reflects his dissatisfaction could be because he associates class with leaving time, reinforced by exhaustion after hours at school. In this context, the science teacher explained that he found it difficult to work with some content, especially with José.

When we analyzed the profile of the class in which he studies, we observed that it was a hectic classroom, a factor that could be justified by his age and the transition between the segments, from elementary school I, with one teacher, to elementary school II, with eight teachers. Understanding the dynamics of changing teachers, organizing them by subject and knowing how to deal with each teacher's anxieties can be a conflict in a phase as complex as early adolescence. The teachers reported that the students had challenges concentrating, lacked organization and care with materials and had not yet got into the routine of 6th grade, which has multi-age teaching.

One day, when proposing an activity on soil types, to be carried out with the educational inclusion agent, the student stood looking out of the window and when asked to do the task, he did it "anyway" - as the teacher put it. In addition, the teacher showed frustration when he realized that José wasn't carrying out the activity in a meaningful way and was distressed by his lack of interest. However, this same teacher observed José carrying out a physical education activity and that some of his classmates were helping him, as it required balance, so he began to wonder how he could propose a lesson that would motivate the student to participate.

1. According to the National Policy on Special Education from the Perspective of Inclusive Education (BRASIL, 2008b), students with sensory, physical and intellectual disabilities, global development disorders (currently known as autism spectrum disorder) and high abilities/ giftedness are considered target audiences for special education.

We understand that successful inclusion depends on the proper structuring of the school environment, the accessibility of content and the continuous development of social and communicative skills. It is important to emphasize that interventions and objectives for application in the classroom for students with disabilities must be planned, since everything around them can influence them positively or not. Therefore, structuring an organized environment in order to reduce anxiety and promote concentration has become fundamental for the student's full participation in an environment rich in opportunities and favorable results. This is why these reflections are based on collaborative work through the analysis of the case study.

## METHODOLOGY

Reflecting on José's learning process, we observed the need to develop activities that encourage communication, interaction and access to technology, since the municipality of Maricá has a variety of technological devices, such as computers, tablets, among others. In addition, tasks were proposed that also encourage socializing with peers, i.e. activities in small groups or pairs to encourage socialization.

Inclusive Education is not just about physically integrating students into the classroom, but also about reformulating teaching practices to meet their individual needs, as mentioned in the Individualized Education Plan (IEP). Mascaro (2018) corroborates this debate by understanding the importance of the school as a key player in this process, presupposing "a pedagogy that is committed to the teaching and learning process, recognizing the specificities of the students in order to promote their intellectual autonomy" (Mascaro, 2018, p. 14).

With this in mind, this study used the action research methodology, which according to Thiollent (2011) has stages of diagnosis, intervention and evaluation, making it possible to draw a parallel with the procedural construction of the IEP. The aim of the intervention was to foster a more feasible training path for José, eliminating the possible barriers that hinder learning and promoting his development and socialization, especially in science classes.

Initially, to find out more about the student's expectations and tastes, the educational and pedagogical guidance team, the educational inclusion agent and the science teacher spoke to José. The conversation with the student was necessary because the subject, part of the process, feels welcomed and understood in his individualities.

Subsequently, a case study was carried out, making it possible to understand processes that have not yet been consolidated, but through a sensitive look at the object analyzed, mediation and intervention, solid paths for learning are built. According to Monteiro, Tormes and Moura (2018), the case study methodology makes a relevant contribution to educational research by enabling reflection, decision-making and the definition of new paths based on real contexts, reverberating new practices in the present time and for contemporaneity. From this perspective, it enables educators to analyze educational inclusion and (re) understand the obstacles that permeate this process in order to collaboratively envision possibilities for tackling them.

So, with planning aimed at making lessons more attractive and developing learning, a survey was carried out to build activities geared to the student's interests, for example, whether they like drawings, practical and tactile tasks, or whether they use technological tools. Afterwards, the professionals looked at the IEP to reflect on the process and create

strategies in line with the student's age and aspirations. According to Braun:

The conception of this student, who he is, needs to be based on how well we know him: it is important to know what this student does, how he does it, what the conditions are, because somehow he does it. However, since they don't do it conventionally, like the rest of their classmates, we usually mark them down as not reading, writing or understanding more complex concepts (Braun, 2012, p. 175).

Through the data produced during the study, the aim was to build a horizontal relationship with the teachers, in which debate and reflection on the problem situation was encouraged in order to identify the causes and factors involved. In this process, teachers were encouraged to express their wishes, desires and vision of possible training paths for students with intellectual disabilities in mainstream schools.

The actions of the training course will seek to analyze how collaborative work, based on the protocol of the Individualized Educational Plan, can collaborate with the construction of content and activities according to the current demands of each subject, contextualized to their different realities.

It was noted that the science teacher had not produced an IEP according to José's individual needs. Therefore, other interventions and curricular strategies that respected his stage of development were considered. So the process of reformulating a plan that took into account the student's specificities was based on the diagram below:

Based on the dialog with the student and the educational inclusion agent, it was noted that there was a need to build a flowchart that represented the routines of the classes so that José could follow, along with the educational inclusion agent, the progression of the classes and the changes of teachers. We opted for the

flowchart model with photos of the teachers and texts, as it makes it easier to visualize and brings the subject closer to their context, as well as allowing the process to flow and be understood, like the model below:

## RESULTS

Reflecting on José's learning process, activities were chosen to promote communication, interaction and access to technologies, since they are part of the student's reality. Activities were also designed to encourage interaction with classmates and other students at the school, improving the student's socialization. These objectives are justified by inclusive principles, which prioritize the student's full participation, which includes access, permanence and the construction of knowledge.

Successful inclusion therefore depends on the proper structuring of the school environment, the use of assistive technologies and the continuous development of social and communication skills. It is important to emphasize that interventions and objectives for application in the classroom for students with disabilities must be planned, since everything around them can influence them positively or not. Thus, structuring an educational space that is well prepared, rich in opportunities and with more accessible methods provides for more fluid learning, promoting well-being and quality in the educational process for both parties.

The teacher and the educational inclusion agent mediated learning by preparing an environment conducive to the development of skills that had not yet been consolidated, but which, through external stimuli, were accessed and appropriated by the student.



## CONCLUSION

As a result of the activities listed, the collaborative and dialogical work between education professionals and students, it was possible to observe that José began to feel part of the educational process, a protagonist, showing more interest in the activities, less anxiety and impulsiveness about leaving school. That space became pleasant for the student, as it encompassed all of his plurality.

It was concluded that regardless of the methods used, teachers need to use multiple tools to find levels of support that best suit the profile of their students and the objectives they want to achieve in the short, medium and long term, proposing personalized practices that collaborate with school inclusion. Analysis of the case showed that the creation of a welcoming and understanding environment facilitated the student's educational and social development.

We stress the importance of rethinking and reinventing pedagogical practices so that diversity can fit into the classroom. It is necessary to give up educational traditionalism, which values standardizing bodies and knowledge, disregarding multiple intelligences and ways of learning. There is an urgent need to restructure an education that seeks to reach everyone, to be for everyone, but which was designed for some.

Therefore, a space was built so that students could be observed in a more individualized way, specific to different activities (e.g. reading, individual work, rest time), helping with their organization. The use of visual routines, such as the creation of a flowchart - a class timetable - also made a significant contribution to helping José understand the stages that permeate elementary II classes.

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