

**INTERACTION BETWEEN TEACHER AND DEAF  
STUDENT: A CASE STUDY IN THE BRAZILIAN  
INCLUSIVE CONTEXT**

**INTERAÇÃO ENTRE PROFESSOR E ESTUDANTE SURDO: UM  
ESTUDO DE CASO NO CONTEXTO INCLUSIVO BRASILEIRO**

*Maíra Souza Machado*

State University of Southwest Bahia, Brazil

*Anabela Cruz-Santos*

Research Centre on Child Studies  
University of Minho, Portugal

*Ana Cristina Santos Duarte*

State University of Southwest Bahia, Brazil

**Abstract**

The aim of this research is to understand how the interaction between a teacher and a deaf student takes place in a class in the early years of elementary school in a Brazilian school. To achieve this goal, a semi-structured interview and observation with a field diary were used. This is a qualitative, descriptive case study that analyses the subjects in their social context and the interactions that take place between them. The analysed data showed that a good interaction between the teacher and the deaf student encourages and favours the deaf student's participation in classroom activities. It was found that the student participated in class, interacted with classmates and the teacher, and that Libras were used at certain times in class to expand the vocabulary of the listeners. Despite the challenges inherent in the Brazilian educational context, we have seen positive strategies being developed in a public school from an inclusive perspective.

**Keywords:** deafness, libras, inclusion

---

**Resumo**

O objetivo desta investigação é compreender como ocorre a interação entre um professor e um aluno surdo numa turma dos primeiros anos do ensino fundamental numa escola brasileira. Para atingir esse objetivo foram utilizadas entrevistas semiestruturadas e observação com diário de campo. Trata-se de um estudo de caso qualitativo e descritivo que analisa os sujeitos no seu contexto social

e as interações que ocorrem entre eles. Os dados analisados mostraram que uma boa interação entre o professor e o aluno surdo incentiva e favorece a participação do aluno surdo nas atividades da sala de aula. Verificou-se que o aluno participava na aula, interagiu com os colegas e com o professor, e que a Libras era utilizada em determinados momentos da aula para expandir o vocabulário dos ouvintes. Apesar dos desafios inerentes ao contexto educativo brasileiro, vimos estratégias positivas a serem desenvolvidas numa escola pública a partir de uma perspectiva inclusiva.

**Palavras-chave:** surdez, libras, inclusão

---

## Introduction

Inclusive education advocates access, permanence and participation for all students in mainstream schools in order to promote learning situations, especially for students with disabilities. It is well known that the meaning relationships established in the encounter with others are not only established through oral language. In the case of deaf children, interpersonal relationships and social exchange are nourished by the interaction they establish with their peers, teachers and family (Vygotsky, 2000).

Interaction plays an important and multifaceted role in deaf education and its relevance covers aspects of teaching and learning, cognitive development, inclusion and affectivity (Franco, 2016; Pimentel et al., 2018; Prieto, 2022). There is a consensus in the literature that the interaction between teacher and student is essential for the construction of knowledge and the effectiveness of the educational process (Carminatti, 2018; Critelli, 2017; Franco, 2016; Machado et al., 2024). Specifically, it is important to analyse the aspects that influence the establishment of this positive interaction between teacher and student with deafness. It is known that several factors influence the interaction between teachers and students with disabilities, among them: teacher training from an inclusive perspective, teaching knowledge, school environment, curriculum, mastery of sign language, among others.

In an inclusive context, the exchange of knowledge, experience and information involves both the teacher and the student, and this should guide pedagogical practices and interpersonal relationships based on dialogue and mutual learning. In the case of deaf students, the interaction with the hearing teacher involves a different culture and semantic structures between the languages (Libras and Portuguese) that need to be taken into account when planning lessons (Critelli, 2017).

Teachers need to organise their planning with didactic-pedagogical resources and strategies that take into account deaf students and, at the same time, convey the deaf student's understanding of scientific knowledge. To this end,

schools need to become training grounds for inclusion, developing continuous training that helps and empowers teachers to better understand the basic principles of inclusive education (Melro, 2024).

In this context, some questions arose that motivated the development of this research. What is the relationship between the teacher and the deaf student in the classroom? Is there any interaction between the teacher and the deaf student? To this end, this article seeks to understand how the interaction between the teacher and the deaf student takes place in a class in the early years of primary school in a Brazilian school. Melro (2024) points out that the teacher is a fundamental actor in the process of making inclusive education a reality.

### **Theoretical concepts**

Historical conceptions of deafness are still very much based on the belief, popularized in the 1960s, that spoken language is the only form of language, creating stereotypes and stigmas about deaf people who rely on sign language.

Aristotle, in the 4th century BC, believed that hearing was the most important way to learn. In the Middle Ages, a period characterized by Christian beliefs, in Europe mainly Catholic beliefs, it was believed that the deaf would not be saved (Capovilla & Capovilla, 2002) and from the spread of the idea that man was the image and likeness of God, that is, a "perfect being", the idea of the human condition as a "perfect" existence spread. And those who were not "perfect" were relegated to the margins of society. According to Strobel (2008), many terrible injustices took place and deaf people were stoned or burned to death.

It can be seen that cultural aspects have continued for decades and have persisted throughout history, demarcating places and denoting structures and patterns for society, which has interpretative repertoires constituted by history itself, and these repertoires institute powers and define practices that subordinate minority groups (Sá, 2011), such as the group of deaf people. In the Brazilian classroom, deaf students face many difficulties related to attitudinal issues from teachers and classmates. Sometimes, teachers do not master Libras (Alves et al.; 2024; Franco, 2016; Sanches & Silva, 2019) and create low expectations regarding the learning of deaf students (Silva & Pereira, 2003). In many situations, there is a communication barrier because many teachers do not master sign language and rely on Libras's interpreters to communicate with deaf students (Sanches & Silva, 2019).

Strobel (2008) says that when she was at school, she often found herself "staring at the wall" during lessons. The author explains that this expression represents the countless times she felt excluded because she couldn't lip-read. For many years, deaf education was based on oralism, a method that uses speech training, lip-reading and other methods to subjugate deaf people to hearing practices. Strobel (2008) uses the term 'ethnocentric hearing' to describe the abandonment of sign language, Deaf culture and identity in favour of practices shaped by hearing culture. This period coincides with the year 1880, when the

International Congress of Teachers of the Deaf was held in Milan, Italy, and the oral method was adopted as the only appropriate method for educating the deaf.

At the end of the 19th century, deaf people in Germany decided to isolate and hide themselves because of the national emphasis on a single, uniform identity in which differences, including linguistic ones, were disregarded (Capovilla & Capovilla, 2002). It can be seen that during this period there was an association of deaf people with the negative characteristic of hearing impairment.

In the 1970s, under the influence of much research on the structure of sign languages, the oralist educational philosophy gave way to the total communication educational philosophy (Capovilla & Capovilla, 2002). Although communication between deaf and hearing children has improved and progressed with the use of total communication, this approach implies a discontinuity between language and sign language, as demonstrated by researches such as Hansen's (1990), in which he proved that "children do not become bilingual but "hemilingual", without having full access to both languages and without knowing the boundaries between one and the other" (Capovilla & Capovilla, 2002, p. 136).

In this context, the educational philosophy of bilingualism emerged as a viable alternative to the gaps left by oralism and total communication.

Skliar (2003) believes that it is not only the difference between sameness and otherness that defines the power of the other to exist, but rather the guarantee of a presence that was previously ignored, imprisoned.

## **Method**

The data presented in this article are part of the first author's doctoral research. It was a qualitative and descriptive study (Bogdan & Biklen, 1994) carried out in a town in the interior of the state of Bahia, Brazil. The entire study was submitted to the Ethics Committee of the Universidade Estadual do Sudoeste da Bahia (UESB), Jequié Campus, and was approved under opinion number 5.290.833 and CAAE: 56135421.7.0000.0055.

The research was carried out in a primary school (Early Years) of the municipal public school system in a town in the interior of the State of Bahia. To select this site, we established the following criteria: 1) a public educational institution for children; 2) children with disabilities enrolled; 3) deaf students enrolled.

When we found the community school, we contacted the teacher of the class in which the deaf student was enrolled and she readily agreed to participate in the research by signing the Informed Consent Form (ICF). We then contacted the family of the deaf child, explained the aims of the research and they agreed to take part in the study by signing the consent form.

For ethical reasons, we have removed the names of the research participants. In view of this, we will refer to the deaf student as 'the child' and to the teacher as 'the classroom teacher'.

Regarding the participants' profiles, we note that the teacher had a degree in Education and five years' experience, but no specialization. The deaf child, who was seven years old, was very cheerful and sociable, and lived near the school with his family. The Libras interpreter had a degree in Biology and had completed a specialization course in sign language. She had eight years' experience.

The research took place in a regular education class that included the deaf student and twenty-eight other children. Two of the children were deaf, but only one participated in the research because only that child's family gave consent.

The tools used to collect information were semi-structured interviews with the teacher and observation using a field diary. The immersion took place in the classroom over a period of three months with the aim of observing and recording interactive episodes between the teacher and the deaf student, between the deaf student and his classmates, the teacher's mediation during the proposed activities and the deaf student's participation in the classroom activities. The semi-structured interview questions were organized according to a predefined script, allowing for the spontaneous exploration of answers and emerging themes.

During the observation, a script was used to support the recording of actions, gestures and expressions identified in the environment, based on key points of interest related to the research question.

Among the various issues observed, we provide the following examples:

- Does the student interact with people in the school community, such as teachers, classmates, parents, the lunch lady, the janitor, the secretary and the principal?

- How do they establish this interaction?

- Do they communicate through gestures, facial expressions or other body movements, such as pointing or gesturing? When do they interact? Is it at any time, only when they need help, at lunchtime, when they want to go to the bathroom or at other times?

- What is the daily dynamic in a classroom with a deaf student?

- How are emotional relationships established in the classroom?

- Is there an emotional relationship between the teacher and the student? And between the student and the interpreter? And between the student and their classmates? How is this demonstrated?

- Does the student participate in the proposed activities?

- Does the student with disabilities interact with their classmates? How? When? And with the teacher? And with the interpreter?

-Does the student with disabilities participate in class? Do they express their opinions? How?

It is worth noting that drawings and sketches were included in the notes taken during the research, showing the spatial relationships between participants. These relationships are fundamental to establishing interaction between students in the class.

We used Content Analysis for data analysis and production, according to the criteria formulated by Bardin (2007). This involved pre-analysis, exploration of the material, data processing and presentation of the results.

The categories emerged from the data itself. Throughout the analysis corpus, we identified thematic patterns and coded similar excerpts according to Bardin's (2007) inductive form of analysis. We then established the following categories for data analysis: interpersonal dimension, affective dimension, and formative-professional dimension.

For this work specifically, we selected data and analytical elements from the 'interpersonal dimension' category.

To ensure the credibility of the data and interpretations, we considered strategies such as the researcher remaining in the field until data saturation, using diverse sources (interviews and observations), and providing detailed accounts of situations and experiences.

## **Results and discussion**

The units of meaning and the analytical elements of the interpersonal dimension occurred in different moments experienced by the deaf student in the classroom, in different moments of the teacher's lessons and in extracts from the interview with the teacher.

The deaf student was in the second year of primary school and there were twenty-eight children in his class, including another child called Marcos (the deaf child and the autistic), but the second student did not participate in the research because he was absent from class. At the time, the teacher was concerned and indicated that she would contact the family to find out more about the student's repeated absences.

During her immersion in the classroom, the researcher noticed that the deaf student interacted well with his classmates and children from other classes. From the moment he entered the school gate until he arrived in the classroom, the child greeted the people he met along the way. Sometimes with gestures, sometimes with signs in Libras.

During the break, the student interacted with other children who didn't know Libras, and with those who did, he used sign language. The excerpt from the

teacher's interview confirms the student's sociability, receptiveness and empathy with people in his social environment:

the student is very expressive, he communicates with the school caretaker using gestures and with some of the staff who know signs (such as good afternoon) he says hello in Libras (excerpt from the teacher's interview).

The school, located in a peripheral area of the city, had a good physical structure with professionals who were obviously involved in the social institution.

The daily dynamics in the class were unique. Let's take a look at an extract from the field diary Observation of Class 03 - Week 01: Before the lesson started, the Libras interpreter asked the pupils to pay attention because he was going to call the roll. He then explained what the dynamics would be that day:

Today I'm going to do it differently, each person I address will have to respond by giving the name of their best friend in Libras. At this point everyone was euphoric, choosing and remembering the signs of their colleagues. The interpreter started the call and the children participated naturally, sharing the signs with great enthusiasm and naturalness (excerpt from the field diary).

In this excerpt, we can see the concern of the teacher and the Libras interpreter to reinforce the students' signs and, consequently, to promote interaction between them. Contrary to the research carried out by Silva and Pereira (2003), in which the teachers' speeches showed a low level of expectation of the deaf student's learning, we found attention and pedagogical care for all the students in the class, including the deaf student.

As Monteiro and Gaspar (2007) point out, the interaction between teacher and student in the classroom is of paramount importance, but not every interaction contributes to student learning. The authors believe that the interaction that contributes to learning is the one that is mobilized within the student's zone of proximal development.

In this way, the definition of the situation, intersubjectivity and semiotic mediation are important constructs that give meaning to the activities developed in the classroom. For Tassoni (2000), learning as a social process occurs when the focus shifts from content to interactions and teaching procedures.

The students' euphoria about the proposed activity shows curiosity and interest. Custódio Filho (2007) characterizes the following emotions, among others: curiosity, interest, love, joy, sadness and anger. According to the author, when a person is interested, they show signs of attention and curiosity. These signs were identified in class 03 through the active participation of the children.

During the interview, the teacher recalls a situation that occurred during one of her science lessons:

I like to bring in the text and ask: do you know how recycling is done? Then the children always join in. And everyone wants to talk and take part. So the children talk and are happy to take part. I asked the first questions and they said: look, at home I collect it like this. Then another one: my mum doesn't separate the rubbish. The other: oh, I've seen it in such and such a place (interview with the teacher). The mediation carried out by the teacher confirms the mobilization of the zone of proximal development of the pupils, because the teacher creates a learning situation that challenges students to think, to organize their ideas and to share them with their peers.

During the lessons, we noticed that the students who participated orally answering the teacher's questions, or even the deaf student when participated in Libras, showed facial signs of joy, contentment and satisfaction.

According to Custódio Filho (2007), joy belongs to the class of value-based emotions and expresses a person's feelings about something. In the classroom, when "a rich experience takes place in which the student has attentively participated, discussed and deeply understood a certain content, he is likely to register a positive feeling about this experience in his affective-cognitive structure" (Custódio Filho, 2007, p. 155). During the observation period, we identified one aspect that caught our attention: the arrangement of the school desks. Each week there was a rotation of students sitting next to the deaf student.

During the first week of observation, we identified moments of interaction between the student and the teacher. The student went to the teacher's desk several times during the lesson to complain about his classmates who were disturbing him with games or to ask permission to go to the toilet. During his contact with the teacher, he uses signs in Libras that the teacher already knows, such as: toilet and water, the teacher uses gestures (such as shaking her head up and down to indicate yes) to authorize the pupil to leave and sometimes asks the interpreter to help her remember the sign: yes, and free.

During the second week of observation, we again saw the pupils sitting around the student. This seemed deliberate, so I asked the teacher why the children were changing desks. She explained that the change was indeed deliberate and that the reason for it was to allow all the children in the class to have contact with him.

This initiative in an early primary school class is of paramount importance for the realization of the inclusive paradigm, as it demonstrates the teacher's concern for the process of empathy, belonging, respect, and interaction between the students in the class.

Throughout the weeks, we observed the students' efforts to communicate with the student. Sometimes with gestures, sometimes with pantomime, sometimes with a mixture of Libras and gestures, but the interaction was always established.

Currently, many studies (Alves et al., 2024; Franco, 2016; Sanches & Silva, 2019) show that the communication barrier due to the lack of knowledge of Libras, both on the part of teachers and classmates, affects the learning process of deaf



students. When it comes to this context in science education, the reality is no different. Deaf students also find it difficult to communicate, understand and assimilate scientific concepts (Pimentel et al., 2018).

On the other hand, in the student's classroom, we observed the teacher's continuous efforts to promote interaction and communication between his peers (listeners and non-listeners). With regard to students in the early years, Magalhães et al. (2022) tried to understand aspects related to science teaching in the early years of primary school and the results showed that several studies that used investigative processes associated with experimental activities and group activities showed evidence that experiments, and group study favored social interaction and a greater capacity for dialogue. For the authors, the process of scientific literacy also requires skills and attitudes that enable them to deal with social situations.

In the fourth week of observation, the teacher had planned another lesson with a group activity on the topic: Selective collection.

...the teacher began her explanation by presenting ideas about the environment, asking the pupils what they knew about the subject, about man's action in nature, about the damage caused by man, etc. She asked questions so that the children could share their experiences. As she explained, she asked questions so that the children could share their experiences. At one point the student raised his hand and asked to speak. He pointed out that there were jackfruit trees in the fields where he lived and that he liked to eat them, but that there were men who cut down the trees (excerpt from the field diary).

After the student's participation, the teacher immediately congratulated him on his contextualization and linked the example he had given to the deforestation caused by man in the forests, by burning, by excessive waste produced by man and by improper disposal directly into nature.

In this class, different aspects were noticed and recorded. The use of questions was one of them. The class remained attentive and reflective to the teacher's questions.

The student participation during the lesson showed that he shared with his classmates his understanding of the teacher's explanation and that he related the content to his experiences in rural areas.

According to Silva and Pereira (2003), many teachers don't believe in the potential of deaf students. In this case, we saw the opposite: his teacher took responsibility for teaching and looking for strategies that would enable the deaf student to learn and develop, breaking the stereotype that students with disabilities don't learn.

Furthermore, taking into account the student's real experience in school situations shows the importance of bringing the student's lived experience into the real curriculum. According to Sacristán (1998), beliefs, values, attitudes and

behaviours are intertwined in every experience because real subjects give them meaning based on each experience as a person.

The student's participation is related to the aspects theorized by Vygotsky when he speaks of the Zone of Proximal Development (ZDP) and the Zone of Actual Development (ZAD). The ZDP refers to what the child has learned and is able to do independently. The ZDP corresponds to "the level of actual development tomorrow - that is, what a child can do with help today, he will be able to do alone tomorrow" (Vygotsky, 2000, p. 98). By articulating the scientific content with the reality, he experiences in rural areas, he demonstrates a mobilization of his ZDP.

The opportunity for deaf students to express themselves during the lesson shows, above all, the inclusion of another culture that is different from the normative hearing culture and highlights the deaf culture that uses signs to communicate.

In addition, the access to scientific content, together with the contextualization carried out by the teacher on the basis of the language brought by the deaf student, confirms the prerogative of citizen scientific literacy, in which scientific knowledge is linked to concrete situations (Chassot, 2000; Sasseron & Carvalho, 2008) and helps students to exercise their citizenship in society in a conscious and critical way (Lorenzetti, 2000). Far from the naive view that only science teaching in the early years will be able to promote conscious actions, we believe, like Silva and Lorenzetti (2020), that teachers who "emphasize a critical, transformative, innovative and opinion-forming education" (p. 1) will certainly contribute to the student's insertion into a world of new meanings.

Deaf people's learning is based on a visuospatial perspective, so the teaching of deaf science should take place through the contextualization of the content, through linguistic interaction using written Portuguese, Libras, pantomimes, models, digital and technological resources, visual memory, etc (Queiroz et al., 2012).

It's important to point out that students come to the classroom full of experiences and are not blank slates. These experiences constitute knowledge and can be used by the teacher in the act of teaching. The relationships that are established between the content taught and the students' everyday lives are crucial for meaningful learning. Ausubel (2000) argues that content is only potentially meaningful if it relates to what the learner already knows, otherwise learning will be short-term.

Ausubel (2000) emphasises that learning takes place in an environment of effective communication that welcomes and takes into account the specificities of the students and guides them as an integral part of the new knowledge, using terms and examples that are familiar to them. In this respect, we found an environment in the classroom that was favourable and always receptive to the students' comments, since the deaf student was able to articulate the new information, he received and link it to his existing repertoire.

According to Saltini (2022), the relationship between teacher and student cannot be based on information alone. According to Ausubel (2000) and Moreira and Masini (2009), sustainable learning requires the counterpart of the student and the teacher. Both individuals are essential in establishing interpersonal relationships that will certainly contribute to the development of meaningful learning.

In situations where teachers are demotivated, children's capacity for fruitful ideas is limited. Saltini (2022) says that "the teacher should be a midwife of ideas" (p. 16). We agree with the author when he says that school still excels at persuading, memorizing and assimilating popular ideas. However, we need to reverse these principles and propagate pedagogical actions that stimulate learning and motivate students to produce new ideas.

In the school situation, things are learned that go beyond the specifications of prescribed subjects and contents. For Sacristán (1998), the real curriculum is broader than any document and learning takes place according to the experience of interaction between students and teachers or between students themselves.

In the fourth week of observation, we noticed that the arrangement of the desks had changed again, the room was different from the previous weeks, this time the teacher arranged the chairs in a semicircle.

That day, we noticed that the student paid more attention to his classmates. His attentive gaze was constantly trying to identify the spoken words of each child around the semicircle organized by the teacher.

I noticed that he already understood the rules of coexistence, greeted his classmates with cordiality, showed great respect for the teacher and his classmates, and interacted with everyone in the school.

Let us return to the proposal for the group activity on selective collection. After the teacher's explanation and the participation of several students, the teacher asked the class to divide into four groups to carry out the activity. Even in the midst of an energetic euphoria, the class managed to organize itself to start the activity. The teacher had asked each group to search through the books, newspapers and magazines they had received for images of recyclable materials that are consumed in everyday life. Next, the groups were to stick the images on their respective bins (blue - paper; red - plastic; green - glass; yellow - metal).

...during the group activity, the student and his classmates sitting around him were given books and scissors to start their research (on recyclable materials). The children communicate with glances, facial expressions and manual indications (pointing fingers, "yes" or "no" gestures) of the corresponding images. When the research is finished, the teacher asks each child to choose a picture to stick on the poster (which she has prepared and stuck on the wall). When the first child goes to the poster to stick his picture (of a perfume), the teacher asks the class: - What is this? What kind of material is it? Where should it go? Immediately, he raises his hand, gets restless in his chair and stands up to answer. He

answers by signaling: - It's a jar... it looks like perfume and he points to the green tin. The interpreter looks at him and smiles, indicating that his answers were correct, and says: "Congratulations". His eyes widen, he smiles and raises his arms in excitement (extract from the field diary).

The motivation expressed by the student when he was able to identify the correct form of disposal is evident in the extract above. The teacher's idea of using the poster with the pictures of the selective collection cans together with the group research was a creative way of combining scientific knowledge with a practical activity.

However, in science classes, deaf students need to acquire new vocabulary for scientific terms and for explaining natural phenomena. According to Bargalló (2005), when deaf students acquire new concepts, they improve their language, which means that scientific activity is also a linguistic activity.

The construction of scientific knowledge together with the students shows the potential of dialogical teaching in the perspective of achieving education for all people, including deaf people.

There is a consensus in scientific research that the learning of all students, especially those with disabilities, can be greatly enhanced through hands-on activities (Mastropieri et al., 2024). Once teachers make changes to their teaching and practice, students become actively involved in science activities.

Therefore, it is important for the teacher to consider both general adaptations and adaptations related to the student's disability and the specific science activity when planning activities to teach science (Scruggs & Mastropieri, 2007). I reiterate these guidelines and with greater critical and reflective depth, we as teachers are invited to deconstruct the hearing representation of the deaf person (Skliar, 1998; Strobel, 2007). The hearing perspective not only disenfranchises the deaf, but also fails to respect their majority language, not to mention their identity and culture. In the classroom, we noticed that the student expressed his opinion several times in Libras. This physical and material representation of the student communicating in sign language, in a class of mostly hearing children, has a great social and cultural significance, which is also linked to the social representation of the deaf person.

Silva (2009) states that representation occupies a central place in contemporary identity theory and social movements, and that deaf education must respect linguistic and cultural differences. Whereas in the past negative and limiting social representations of deaf people prevailed, today we are trying to respect their identities and their legitimization as a social group (Strobel, 2007).

Regarding the student participation in class, we agree with Vygotsky (2000), because the formation of concepts requires the mastery of language, the use of words or signs to mediate higher psychological processes. In the case of the deaf student, the signing is the sign in Libras and the science teacher acts as a mediator (as a member of the scientific community), collaborating in the construction of scientific knowledge (Oliveira & Benite, 2015).

The learning of the deaf is based on a visual-spatial perspective, so the teaching of science to the deaf should be done through the contextualization of the content, through linguistic interaction using written Portuguese, Libras, pantomime, models, digital and technological resources, visual memory, etc (Queiroz et al., 2012).

## **Conclusion**

The aim of this study was to understand how the interaction between a teacher and a deaf student takes place in a class in the first years of elementary school in a Brazilian context. It was clear that the research participants have a good relationship and interact satisfactorily in class. In this respect, it can be said that the inclusion process of the deaf student in the regular classroom is not limited to communication only through the interpreter; on the contrary, it was found that the presence of the deaf student in the classroom stimulated the learning of sign language by the hearing students and the teacher.

In general, the data show that there is good interaction between the teacher and the deaf student, as well as between the deaf student and his classmates. Despite her poor command of Libras, the teacher showed interest and effort to maintain a good interpersonal relationship with the deaf student, sometimes communicating through gestures and pantomime.

In several classes we noticed the active participation of the deaf student and this allows us to conclude that the social space: school, for this student, is a space that mobilizes learning from his good linguistic communication, the articulations between scientific knowledge and everyday life that he establishes, the interest and motivation in participating in classes using Libras and the good interaction established with his peers.

The sense of understanding that the deaf student shows in his speeches during the lessons confirms the development of curricular skills and competences, as well as socio-emotional ones, which are trivial characteristics of the inclusive education.

## **References**

- Alves, M., Souza, J., Grenier, M., & Lieberman, L. (2024). The invisible student in physical education classes: Voices from deaf and hard of hearing students on inclusion. *International Journal of Inclusive Education*, 28(3), 231-246. <https://doi.org/10.1080/13603116.2021.1931718>
- Ausubel, D. P. (2000). *The acquisition and retention of knowledge*. Kluwer academic publishers.
- Bargalló, D. M. (2005). Learning science through language. *Educar*, 33, 27-38.

- Bogdan R., & Biklen S. (1994). *Qualitative research in education: An introduction to theory and methods*. Porto Editora.
- Capovilla, A. G. S., & Capovilla, F. C. (2002). Intervenção em dificuldades de leitura e escrita de consciência fonológica. In A.G.S. Capovilla & F.C. Capovilla, *Distúrbios de leitura e escrita: teoria e prática* (p. 5-15). Manole.
- Carminatti, B. (2018). *The teacher-student relationship and its influence on science teaching and learning processes in high school*. PhD thesis (postgraduate program in science education) - Federal University of Rio Grande do Sul, Porto Alegre, Brasil.
- Chassot, A. (2000). *Scientific literacy: Issues and challenges for education*. Editora Unijuí.
- Critelli, B. A. (2017). *Learning to listen to those who do not hear: The challenge for science teachers in working with scientific language with deaf students*. Master's thesis (Faculty of Education) - University of São Paulo, São Paulo, Brasil.
- Custódio Filho, J. F. (2007). *Explaining explanations in science education: Cognitive domain, affective status and feeling of understanding*. PhD Thesis (Postgraduate Program in Scientific and Technological Education) - Universidade Federal de Santa Catarina, Florianópolis, Brasil.
- Franco, E. (2016). Inclusive education: The importance of interaction between teachers and deaf students. *Nuances: Estudos sobre Educação*, 27(1), 247-263.
- Lorenzetti, L. (2000). *Scientific literacy in the context of the early grades*. Dissertation (master's degree in education) - Federal University of Santa Catarina, Florianópolis, Brasil.
- Magalhães, A. P. C., Villagrà, J. M., & Greca, I. M. (2022). *Literature review on teaching and learning in the context of the early years of elementary school*. *Investigações em Ensino de Ciências*, 27(1), 85-107.
- Mastropieri, A., Scruggs, T. E., & Regan, K. (2024). *The inclusive classroom: strategies for effective differentiated instruction*. Pearson.
- Melro, J. (2025). Inclusive education: Teacher training in focus. *Revista Saber Incluir*, 2(3), 1-24.
- Monteiro, I. C. C., & Gaspar, A. (2007). A study on emotions in the context of social interactions in the classroom. *Investigações em Ensino de Ciências*, 12, p. 1.
- Moreira, M. A., & Masini, E. A. F. S. (2009). *Meaningful learning: David Ausubel's theory*. Centauro.
- Oliveira, W. D. & Benite, A. M. C. (2015). Studies on the relationship between the sign language interpreter and the teacher: Implications for science teaching. *Revista Brasileira de Pesquisa em Educação em Ciências*, 15(3), 597-626.
- Pimentel, R., Lucas, L., & Luccas, S. (2018). Teaching Sciences and Biology for deaf individuals: Investigating the context of teaching practice in regular

- classrooms of a municipality in Paraná. *Revista Tempos e Espaços na educação*, 11(26), 201-218.
- Queiroz, T. G. B., Silva, D., & Macedo, K. (2012). Science/chemistry teaching and deafness: The right to be different at school. In W., Vilela-Ribeiro, & A.M.C., Benite, *Themes in inclusive education: foundations for the science classroom* (pp. 119-130). Editorial Academica Española.
- Sá, C. P. (2011). Social Representations: Central Core Theory and Research. *Themes in Psychology*, 4(3), 19-33. <https://pepsic.bvsalud.org/pdf/tp/v4n3/v4n3a02.pdf>
- Sacristán, J. G. (1998). *Curriculum: A reflection on practice*. Artes médicas.
- Saltini, C. J. P. (2022). *Affectivity and intelligence*. Wak.
- Sanches I. R., & Silva, P. B. (2019). The inclusion of deaf students in higher education in brazil: The case of a pedagogy course. *Portuguese Journal of Education*, 32(1), 155-172.
- Sasseron, L. H., & Carvalho, A. M. P. (2008). Aiming for scientific literacy in elementary school: Proposing and searching for process indicators. *Investigações em Ensino de Ciências*, 13(3), 333-352.
- Scruggs, T. E., & Mastropieri, M. A. (2007). Scientific learning in special education: The case for constructed versus instructed learning. *Exceptionality*, 15, 57-74. <https://doi.org/10.1080/09362830701294144>
- Silva, A., & Pereira, M. (2003). The image that regular school teachers have in relation to the learning of deaf students. *Revista Estudos de Psicologia*, 20(2), 5-13.
- Silva, M. (2009). *Identity and deafness: The work of a deaf teacher with hearing students*. Plexus.
- Silva, V. R., & Lorenzetti, L. (2020). Scientific literacy in the early years: The indicators evidenced through a didactic sequence. *Educação e Pesquisa*, 46 (e22995), 45-46.
- Skliar, C. (1998). *Deafness: A look at the differences*. Mediação.
- Skliar, C. (2003). Education and the question of others: Difference, alterity, diversity and the other "others", *Ponto de Vista*, 5, 37-49.
- Strobel, K. L. (2008). History of the deaf: "masked" representations of deaf identities. In Quadros, R. M., & Perlin, G. (org.), *Estudos Surdos II*. Arara Azul.
- Tassoni, E. C. M. (2000). *Affectivity and learning: The teacher-student relationship*. In XXIII Annual Meeting of ANPed. Caxambu, MG.
- Vygotsky, L. S. (2000). *The construction of thought and language*. Martins Fontes.

## **Funding**

This work was carried out with the support of the Coordination for the Improvement of Higher Education Personnel - Brazil (CAPES) - Funding Code 001 during the first author's PhD and financially supported by Portuguese national funds through the FCT (Foundation for Science and Technology) within the framework of the CIEC (Research Centre on Child Studies of the University of Minho) project under the reference UID/00317: Research Centre on Child Studies.

## **Bionotes**

Maíra Souza Machado, (PhD student) at State University of Southwest Bahia-Brazil/ Research Centre on Child Studies (CIEC), Institute of Education, University of Minho, Braga, Portugal.

E-mail: [maira.machado1@hotmail.com](mailto:maira.machado1@hotmail.com)

ORCID: <https://orcid.org/0000-0003-1219-7026>

Anabela Cruz-Santos (PhD), Assistant Professor, Department of Educational Psychology and Special Education, Research Centre on Child Studies (CIEC), Institute of Education, University of Minho, Braga, Portugal.

E-mail: [acs@ie.uminho.pt](mailto:acs@ie.uminho.pt)

ORCID: <https://orcid.org/0000-0002-9985-8466>

Ana Cristina Santos Duarte (PhD), Professor in the Department of Biological Sciences at the State University of Southwest Bahia, Brazil.

E-mail: [tinaduarte2@gmail.com](mailto:tinaduarte2@gmail.com)

ORCID: <https://orcid.org/0000-0002-3537-9095>

Received: March 2025

Published: August 2025