PRÁTICAS EDUCATIVAS, MEMÓRIAS E ORALIDADES

Rev.Pemo – Revista do PEMO

Appropriation of scientific knowledge of deaf students in higher education during the covid-19 pandemic

ARTICLE

Elisiane Alves Dias[i]
Universidade Regional do Cariri, Crato, CE, Brasil
George Pimentel Fernandes[ii]
Universidade Regional do Cariri, Crato, CE, Brasil
Arlane Markely dos Santos Freire[iii]
Secretaria Municipal de Educação, Crato, CE, Brasil

Abstract
This research is part of a master's work developed at Universidade Regional do Cariri, which set out to investigate the process of inclusion and appropriation of knowledge by a deaf student at the HEI. We interviewed teachers, Libras interpreter translators and a deaf student. As a general objective, we seek to understand the process of appropriating the scientific knowledge of a deaf student during the pandemic. The research was characterized as a case study, in which it was possible to learn about the routine experienced in the pandemic, specifically classes for deaf students, and their process of appropriating scientific knowledge took place. As a result, we found that the classes, because they took place remotely, caused certain blockages in the teaching and learning process, and the non-mastery of Libras by teachers and hearing students showed an impediment in communication. Therefore, the process of appropriation of scientific knowledge by the deaf student presented shortcomings.
Keywords: Inclusive Education. Deaf. University Education.

Apropriação do conhecimento científico do aluno surdo no ensino superior durante a pandemia da covid-19

Resumo
A presente pesquisa é um recorte de um trabalho de mestrado desenvolvido na Universidade Regional do Cariri, que se propôs a investigar o processo de inclusão e apropriação de conhecimentos por um aluno surdo na IES. Entrevistamos professores, tradutores-intérpretes de Libras e um aluno surdo. Como objetivo geral, buscamos compreender o processo de apropriação do conhecimento científico de um aluno surdo durante a pandemia. A pesquisa se caracterizou um estudo de caso, no qual foi possível conhecer a rotina vivenciada na pandemia e como ocorreram as aulas, especificamente para o aluno surdo e seu processo de apropriação dos conhecimentos científicos. Como resultados, verificamos que as aulas, por terem acontecido de forma remota, causaram determinados bloqueios no processo de ensino e aprendizagem, e o não domínio da Libras pelos docentes e alunos ouvintes mostrou-se como um impedimento na comunicação. Portanto,

DOI: https://doi.org/10.47149/pemo.v6.e10814
https://revistas.uece.br/index.php/revpemo
ISSN: 2675-519X

o processo de apropriação dos conhecimentos científicos pelo aluno surdo apresentou fragilidades.
Palavras-chave: Educação Inclusiva. Surdo. Ensino Superior.

1 Introduction

Studies on the deaf are part of inclusive education, which in recent decades has been the highlight of themes and publications in the educational field. The focus on this topic contributes to expanding knowledge and clarifying particular issues in education. In this sense, educational institutions indicate a way of laying out the educational system that meets the needs of all students (Mantoan, 2003). Each student has particularities in their development that must be taken into account and addressed by educational institutions in the interests of inclusive education.

Debates regarding deafness and the Brazilian Sign Language (Libras) have been expanded in recent years by students, professionals and the deaf community itself involved in deaf education, a specific area in the discussions held in the inclusive educational context.

The deaf can be described in different ways in the literature. Quadros (2004) stated that deaf people are those who identify themselves as deaf and who understand the different situations around them through visual experiences, as well as having the right and possibility to acquire Libras and Portuguese in written form.

In Brazil, Libras is recognized through the enactment of Law No. 10.436, of April 24, 2002, which certifies it as a legal means of communication and expression, as a grammatical and linguistic system proper to a language, and Decree No. 5.626/2005, which regulates it. With the implementation of this legislation, changes have been made to deaf education. However, there are still barriers to communication between deaf and hearing people in different segments of society, and particularly at university.

Lima (2018) points out that the growing demand for deaf undergraduates entering higher education results in reflections on the teaching strategies developed at these

DOI: https://doi.org/10.47149/pemo.v6.e10814
https://revistas.uece.br/index.php/revpemo
ISSN: 2675-519X

institutions. As a result, it contributes to students' success in higher education. In this way, the academic training process undergoes changes and adaptations.

Moura and Harrison (2010) argue that the inclusion of deaf undergraduates in higher education makes it necessary for teachers and interpreters of Libras to have knowledge of the linguistic particularities that involve language in the form of expression to communication and in written form. Considering this scenario, by being aware of these specific characteristics of sign language and writing, these professionals contribute to an inclusive and equitable environment.

Throughout the cultural development of individuals, they come into contact with different types of knowledge, including scientific knowledge, which enables them to expand their higher psychic functions. Facci (2004) emphasizes that teachers need to be aware of the peculiarities of psychological development at different stages of evolution, so that they can define strategies to enable the appropriation of scientific knowledge.

Martins (1997) points out that in the interactions between children themselves and adults, the negotiation of meanings favors the transition from spontaneous knowledge to scientific knowledge, thus enabling students to appropriate the cultural legacy as a means of favoring the construction of higher psychic functions. This certainly includes the appropriation of Libras, which favors psychological transformation and, consequently, learning.

All these considerations about Libras are immersed within a broader educational context, which also includes Bilingual Education and Inclusive Education. Having made these points, this paper investigates the process of inclusion within an atypical context, which in 2020 led to the suspension of face-to-face activities at Higher Education Institutions (HEIs) and basic education schools in several countries. This was due to the Covid-19 pandemic caused by the Severe Acute Respiratory Syndrome CoV-2 (SARS-CoV-2) coronavirus. In Brazil, the Ministry of Education (MEC) initially authorized the replacement of face-to-face classes with digital classes for HEIs that are part of the federal education system, through Ordinance No. 343. In this scenario, the measures ended up being extended several times, considering the increasing number of cases. Following the

DOI: https://doi.org/10.47149/pemo.v6.e10814
https://revistas.uece.br/index.php/revpemo
ISSN: 2675-519X

health emergency, similar measures were taken by states and municipalities, and education departments began to formulate specific regulations in order to comply with the school calendar, and educators were instructed, with the help of technological resources, to use remote activities to comply with their study programs (Valdevino; Costa; Freire, 2021).

Students have had to adapt to remote classes in times of pandemic in order to continue their studies, and for many deaf undergraduates this moment is more difficult due to the lack of interpreters in online classes. These professionals, as Lacerda (2012, p. 255) states, "help a message to cross the language barrier between two communities". Therefore, the absence of this professional in classes interferes with the mediation of content, understanding and learning of deaf undergraduates, as well as their right to formal access to scientific knowledge.

During the pandemic, digital platforms were used to hold remote classes, such as Google Meet, Zoom, WhatsApp and Cisco Webex. These are examples of channels that allow you to connect with several people at the same time, although some issues can interfere with communication. As highlighted by Shimazaki; Menegassi and Fellini (2020), for deaf undergraduates the way in which statements are signaled or translated using Libras or written Portuguese is a factor to be taken into account in the process of understanding remote classes, as well as the lack of mastery of Libras by the student or teacher.

As a result of these reflections, some questions emerged to guide this study: how does the process of acquiring scientific knowledge occur for deaf students in higher education during the pandemic? What strategies do teachers use with deaf students in class? What strategies do Libras interpreters use to mediate with deaf students? What are the learning needs of deaf students?

In view of the questions raised, by looking at the educational context in the pandemic period, which began in Brazil in March 2020, and within the scope of the research that was developed during the Professional Master's Degree in Education, this article aims to understand the process of appropriation of scientific knowledge by a deaf student in

Rev.Pemo, Fortaleza, v. 6, e10814, 2024
DOI: https://doi.org/10.47149/pemo.v6.e10814
https://revistas.uece.br/index.php/revpemo
ISSN: 2675-519X

higher education during the Covid-19 Pandemic. The locus of the study is a state public university in the Metropolitan Region of Cariri Cearense, whose central campus is located around 600 km from the capital, Fortaleza, in the south of the state of Ceará.

2 Methodology

2.1 Ethical criteria

This research was approved by the Human Research Ethics Committee of the Universidade Regional do Cariri (URCA), opinion no. 3.895.917. The participants received explanations about the purpose of the research and the objectives, as well as the voluntary nature of the study. The Informed Consent Form (ICF) was sent to the participants for them to read and, after reading the information described, they signed the Post-Consent Form, authorizing the start of the observations and interviews, according to resolution 466/12 of the National Health Council.

The deaf participants were informed about the ICF in Libras, respecting their first language, and all stages of the research were mediated by Libras translators.

2.2 Participants

We carefully analyzed the case of a deaf undergraduate entering a public university. We opted for a semi-structured interview as a data collection tool, as it allows direct contact with the research participants, enabling interaction between the interviewer and the interviewees (Pabis, 2012).

The research is characterized as a case study, which aims to "gather relevant data on the object of study and thus achieve a broader understanding of that object" (Chizzotti, 2006, p. 136). The investigation took place at the Universidade Regional do Cariri, in the Pedagogy course, involving four teachers, two Libras interpreters and a deaf student as key participants in this study.

DOI: https://doi.org/10.47149/pemo.v6.e10814
https://revistas.uece.br/index.php/revpemo
ISSN: 2675-519X

The student participant was 23 years old and in his fourth semester of the Pedagogy course at URCA, located on the central campus in the municipality of Crato. He came from a hearing family of five - two sisters, his mother and father - and was born deaf, thus congenitally deaf. He went through several obstacles to continue his studies until he was admitted to a public university.

2.3 Instruments and procedures

A semi-structured interview was used, which allowed the researchers to ask certain questions related to the objectives under investigation and the appropriate strategies to instigate the interviewees, leaving them free to answer the questions and maintaining a direct relationship with them.

> In general, a semi-structured interview is one that starts with certain basic questions, based on theories and hypotheses that are of interest to the research, and then offers a wide range of questions, the fruit of new hypotheses that emerge as the informant's answers are received (Triviños, 1987, p. 146).

The interview took place online using the Google Meet digital platform. Through it, it was possible to talk virtually with the participants and find out their opinions and suggestions about the learning process of deaf undergraduates and, above all, find out from the undergraduates themselves about their difficulties, desires and suggestions for contributing to their learning. This procedure was taken by decision of the authors, given that at the time of data collection the country was still in social isolation due to the Covid-19 pandemic, so the academic activities of the HEIs were taking place virtually.

Based on historical and dialectical materialism, for Marx (2004), the human being is a natural being, that is, a living being endowed with natural and vital forces, an active natural being. And these forces that exist and act in the human being are possibilities and capacities that develop in society. However, man is not just a natural being; he is a human natural being, that is, a being existing for himself.

Rev.Pemo, Fortaleza, v. 6, e10814, 2024
DOI: https://doi.org/10.47149/pemo.v6.e10814
https://revistas.uece.br/index.php/revpemo
ISSN: 2675-519X

Therefore, the deaf are human beings, active beings and, like the rest of us, have capacities and possibilities for development and learning in society, as long as they are offered resources and means that contribute to this evolutionary process. This goes against the exclusionary teaching that prevails in capitalist society, excluding deaf people from the various segments of society. As Perlin (1998, p. 80) reveals, "the deaf narratives that are constantly in the light of day are full of exclusion, oppression and stereotypes". We therefore sought to analyze the interviewees' responses carefully.

3 Results and Discussion

After the interviews with the participants, two categories emerged which guided the analysis of the data: "Communication established between the participants in the classroom" and "Learning for deaf undergraduates in the academic environment: reflections and suggestions". In order to present the results of these analyses and achieve the objectives set by the work, we have divided this section into four parts. In the first, we look at the profile of the research participants; then we discuss remote teaching. In the third part, we discuss how communication took place during this period and, finally, we present reflections on the learning of deaf students.

3.1 Participants in the research

In the interview stage, the participants were four teachers, two Libras translators who accompanied the deaf student and the student himself, totaling seven participants, referred to in this study as: Pedagogy course teachers (P1), (P2), (P3), (P4), Deaf student (A1), Libras interpreters (L1) and (L2). To understand the participants' point of view is to look for clues to understanding the problem presented and the central theme of this research.

The selection criteria were deaf undergraduates enrolled in the Pedagogy course at the Universidade Regional do Cariri. We included a student enrolled in the course during the research period, teachers who worked in higher education, specifically in the Pedagogy

DOI: https://doi.org/10.47149/pemo.v6.e10814
https://revistas.uece.br/index.php/revpemo
ISSN: 2675-519X

course in the semester in which the deaf student was enrolled during the research, and the Libras interpreters who mediated the classes for the deaf student.

Table 1 below gives details of the duration of the interviews conducted with the research participants, who consented to take part in the investigation.

Table 1 - Information from the interviews

Participant	Role	Time	Duração da entrevista
A1	Deaf Student	Afternoon	00:50:54
L1	Libras Interpreter	Afternoon	00:51:53
L2	Libras Interpreter	Evening	00:54:37
P1	Teacher	Evening	00:23:36
P2	Teacher	Evening	00:36:59
P3	Teacher	Morning	00:31:58
P4	Teacher	Afternoon	00:35:08

Source: Data obtained from the interviews.

The interviews took place on alternate days, respecting the duties of each participant, during 2021, after the observation period. During the development of the research, we had some challenges, such as carrying out the observations remotely, the availability to schedule the interviews, as there were participants who did not respond, making it difficult to carry out interviews with everyone.

In practice, scheduling the days and times of the interviews took time and dialogue, due to the daily duties of each participant, but we managed to complete this stage.

3.2 Remote observations in higher education

Class observations in the Pedagogy course, in the fourth semester, took place remotely due to the spread of Covid-19, during the months of November and December 2021.

DOI: https://doi.org/10.47149/pemo.v6.e10814
https://revistas.uece.br/index.php/revpemo
ISSN: 2675-519X

The technological resource used in the classes by the teachers of the integrating core[1] was the Google Meet digital platform. During the lessons, visual records were made using Print Screen[2], which consists of capturing the computer screen in real time.

The platform allows screen sharing, so the teachers used this function to show the slides with the content related to the themes, but when using this function, the teachers could not see all the undergraduates in the class, which made it difficult to observe the facial expressions of each one.

On the platform used, there was an option to turn on the camera and microphone, allowing students and teachers to express themselves and show their faces to the class. However, during the remote classes, few undergraduates turned on the camera and often only spoke via microphone when some teachers asked the class to participate on the topic discussed in class. Rarely, did some of the listening undergraduates turn on their cameras so that the others could see their faces and expressions. However, when asked for a photo of the class to register the lesson, most of the undergraduates agreed to take the picture.

The deaf student, the teachers and the Libras interpreters often had the camera on in class, showing their faces and allowing the other undergraduates to get to know a private space in their homes. The deaf student had the support of two professionals, Libras Translators-Interpreters (TILS), who accompanied him during the semester and took part in the online classes, mediating the content and dialogues experienced in class.

Throughout the classes, it was noticeable how the undergraduates hid behind the cameras, showing only initial letters, names or images displayed on the platform. As a result, it was difficult to see the real image of each student during the lessons.

The deaf student's camera stayed on to view the teacher, the interpreters and the slides dealing with the content taught in class. This was especially important so that the

[1] A proposal adopted by the teachers in times of pandemic, which consisted of articulating an interdisciplinary approach that integrated the contents of the subjects with themes discussed by the teachers responsible for the topics defined in the semester analyzed.

[2] To do this, simply use the "PrtScr" key, which is usually located between the "F12" and "Insert" keys on the keyboard, usually at the top. Available at: <https://www.zoom.com.br/notebook/deumzoom/como-tirar-print-da-tela-do-notebook>. Accessed on: July 27, 2021.

Rev.Pemo, Fortaleza, v. 6, e10814, 2024
DOI: https://doi.org/10.47149/pemo.v6.e10814
https://revistas.uece.br/index.php/revpemo
ISSN: 2675-519X

interpreters could see the student and, if they had any questions and/or comments, they could pass them on to the teachers. The visual aspect is of fundamental importance for deaf undergraduates in the educational process, because "the visual field is not just about looking, but more than that, it is the acquisition of language linked to knowledge in the teaching-learning process" (Cunha Junior, 2020, p. 47). In an academic environment surrounded by dialogic relationships, visual perception for deaf undergraduates is essential for visualizing signage in Libras and expressing ideas in a spatial-visual modality.

It's important to note that the deaf student's internet connection to the platform used in class was unstable, so most of the time the student didn't stay until the end of the class, compromising explanations of content and work to be done with the class. Therefore, the deaf student faced difficulties with remote teaching.

3.3 Communication between participants in the classroom

Regarding communication, Emiliano and Tomás (2015) emphasize that language is the main mediator in the construction of higher psychological functions, as it has two fundamental characteristics: communication and the construction of thought. According to Martins (2011), language makes it possible to construct and generalize knowledge, and its main function is communication. It has many possibilities as a means of existence, transmission and assimilation of social-historical experience.

Thinking about the communication that took place during the semester in remote classes between the deaf student, the teachers, the interpreters and his classmates, the interviewer asked how communication was between them and the deaf student. The first teacher replied as follows:

> There was communication via WhatsApp, sometimes he would send me individual messages just for me. But usually it was about the subject, about some work he hadn't understood or some work he hadn't handed in, if he could still send it. And I also know a little bit of Libras, I have a brother who is deaf, because I lived with him I learned some words, some signs in Libras, I always tried to say good morning, to talk (P2).

DOI: https://doi.org/10.47149/pemo.v6.e10814
https://revistas.uece.br/index.php/revpemo
ISSN: 2675-519X

In the remote classes, communication between the deaf undergraduate and the teacher took place in moments of questions via social networks, revealing minimal interaction during the classes using basic Libras signs. Therefore, the use of social networks broadened communication between people and favored dialogue when they shared the same language.

Through technology, deaf students can have contact with multimodal texts, and thus, with more attractive and accessible materials, construct their own texts, using multiple languages (Martins; Lins; 2015). Also based on the authors:

> ICT represented incalculable advances in communication possibilities for deaf people before they entered school. Access to social networks, video calls, instant messaging and online translators ensured that deaf people were able to communicate in ways that had previously been unthinkable, resulting in a great deal of interest and demand for the acquisition of these services and technological devices (Martins; Lins, 2015, p. 202).

The teachers asked about communication in class replied:

> It seemed that it was a group that had been welcoming since previous semesters, but in general, the perception I had was that the class had difficulty communicating and because of this difficulty it was as if they had a certain fear (P2).
>
> I don't know Libras and that's a huge impediment, a teacher not knowing Libras. I think Libras should be a compulsory subject for all teachers. So I don't know Libras and that's a deficiency in my training, I know precisely that I need to learn Libras (P3).

The difficulty in establishing communication links with the deaf student was due to the lack of a common language practiced by the teachers and hearing students. In this sense, the hearing undergraduates, as well as the teachers, did not master the linguistic structure of Libras, with the exception of one teacher who knew some basic Libras signs. Therefore, not mastering Libras causes blockages in communication and interaction with everyone, which consequently interferes with the learning process.

Decree No. 5.626 of 2005, in Article 3, emphasizes that Libras should be included as a compulsory curricular component, a required subject in teacher training courses for

teaching and speech therapy practice. With this decree, new professionals will leave university with knowledge of concepts about deafness, the deaf and, fundamentally, sign language, Libras.

It would be interesting to make the subject of Libras compulsory at all stages of basic education, so that students can learn basic concepts about deafness from a young age through systematized teaching with scientific knowledge. This would help to eradicate prejudices against deaf people in all segments of society.

Corrêa, Sander and Martins (2017) emphasize that deaf people need to live with academics who are proficient in sign language, because the way hearing undergraduates relate to deaf people and the lack of information about them can complicate the training process in higher education.

It was observed that the hearing undergraduates turned off the cameras during most of the classes, making it difficult for the deaf undergraduates to see their colleagues' facial expressions and try to establish some kind of communication exchange. As well as the hearing undergraduates not turning on the camera, they didn't master Libras and didn't ask the Libras interpreters for help in establishing a dialogue with the deaf undergraduate, which showed that there was no effective communication.

The hearing teachers communicated through the Libras interpreters during classes, as most of them did not fully master sign language, which made it difficult to communicate directly with the deaf student. This revealed a dependence on the interpreters to mediate communication with the deaf student.

A few more reports from the teachers:

> I'm very dependent on the interpreter, not least because I don't know Libras, so without the interpreter I can't talk (P1).
>
> Communication took place in this way, my communication was through the translators or when he introduced himself and I was attentive to these issues (P4).

The inclusion of Libras translators and interpreters at the university proved to be more than necessary, as communication was carried out through these professionals who

DOI: https://doi.org/10.47149/pemo.v6.e10814
https://revistas.uece.br/index.php/revpemo
ISSN: 2675-519X

master the linguistic structure of sign language. When there are no people fluent[3] in this language, there will be difficulties in dialoguing with deaf undergraduates entering the academic space.

In a study carried out by Dorziat and Araújo (2012) on sign language interpreters in the context of inclusive education, they found that:

> Even though the reality of the schools and the attitudes of the teachers with whom the interpreters work vary, there seems to be a regularity around the total dependence on the presence of the TILS in the interactions established with deaf people in the classroom in so-called inclusive schools. The lack of minimum knowledge on the part of the teachers makes the interpreter an indispensable professional in every educational process in the classroom (Dorziat; Araújo, 2012, p. 403-404).

The work of these professionals in the classroom is one of the elements that guarantees inclusion, as well as being the only way for deaf students to communicate with other students and teachers. Consider the opinion of the Libras interpreters:

> We're always on the same page, we have to keep communicating so that we can help (I1).
>
> Yes, there has to be. In fact, I'm the bridge to the teachers, because last semester there was only one teacher who has a deaf relative and already knows a bit of Libras, she's not very fluent, but she understands, so it's easier (I2).

The interpreters' experience in higher education demonstrated the harmony that existed between them and the deaf student, as well as the effective communication because they shared the same language. They were the only means, the bridge, for the teachers in the classroom and at the various times when their services were needed.

The interaction between deaf undergraduates and their classmates and teachers should be connected, because when the translator-interpreter is in class, they are carrying out their profession, mediating, bridging the gap between the deaf and the others in class.

[3] "The absence of TILS means that deaf undergraduates are at a disadvantage when it comes to obtaining information because the teachers don't speak sign language". (Gurgel, 2010, p. 36)

Rev.Pemo, Fortaleza, v. 6, e10814, 2024
DOI: https://doi.org/10.47149/pemo.v6.e10814
https://revistas.uece.br/index.php/revpemo
ISSN: 2675-519X

However, it is important to reflect on what the interaction between everyone will be like when this professional is not in class (Almeida; Volpe; Frasson, 2018).

With regard to the deaf student's perspective on the communication established in class, it consists of:

> Some undergraduates manage to communicate with me, some have tried to learn at least something or make gestures, they come up with their own strategies to be able to communicate with me. Sometimes I don't understand the gestures, but there are some students who make an effort to communicate with me. Some teachers show a lot of interest, so sometimes they ask about signs or make gestures to try to explain. I know you have to be patient, so what I don't lack in communication is the Libras interpreter, because the interpreter really knows Libras, so it's easy with him. The others don't know Libras, they have difficulty communicating (A1).

Through his experience in higher education with his teachers, classmates and interpreters, the deaf student described how he communicated with others, reporting an attempt by listeners to communicate with him using gestures, which proved to be ineffective. Regarding the use of gestures in communication, the author Gesser (2009) says that signs are not gestures, because people who communicate through sign languages show feelings, emotions, scientific and abstract concepts.

Thinking about this communication in class, the deaf undergraduate reported his suggestion to contribute to the process of dialog between everyone.

> One thing that's essential but that's missing is in relation to my fellow listeners, the use of Libras, they don't know, so we often drift apart because they don't know, but most of them I can interact well with, but what I really miss is the class learning Libras (A1).

Based on his day-to-day experience with his hearing colleagues and teachers in the academic space, the deaf student revealed an important desire for him, which will intensely change interaction and, above all, communication with everyone, being the 'key' to opening up possibilities that will contribute profoundly to the process of inclusion and learning.

DOI: https://doi.org/10.47149/pemo.v6.e10814
https://revistas.uece.br/index.php/revpemo
ISSN: 2675-519X

3.4 Learning for deaf undergraduates in academia: reflections and suggestions

Vygotsky (2009) says that learning is ahead of development, and the child acquires appropriate habits and skills in a specific area before learning to apply them consciously in society. In this context, learning permanently promotes and stimulates the development of a series of functions that were in the process of maturing. Learning and development do not correspond entirely, but they are two interrelated processes.

Vygotsky (2009, p. 303) points out that "one step of learning can mean a hundred steps of development". Learning is involved in the development of human beings and, consequently, of deaf undergraduates within formal institutions that provide cognitive expansion and access to scientific knowledge. With regard to learning for the deaf, bilingual education aims to enable people with deafness to use two languages in their daily education and social life, providing appropriate development for the deaf.

We tried to identify the deaf student's learning needs, so the student was asked what could be done to contribute to his learning of scientific content in higher education. Take a look at the report:

> I feel that there is a lack of materials being adapted for Libras, some kind of support in the Portuguese language and the lack of acquisition of the Portuguese language makes me fail to learn many subjects in the pedagogy course. If there was anything that could help me acquire Portuguese, it would help, because I feel this difficulty. If I had extra classes in Portuguese, that would be great (A1).

For the deaf undergraduate student, what would really contribute to his learning would be adapted materials in Libras and support in the process of acquiring written Portuguese, as he has difficulties in this process.

The teaching and learning process involves undergraduates, teachers and other people who are involved in this learning process. Regarding the learning of deaf undergraduates, authors Cruz and Dias (2009) report that learning must take place in a context of contact, interrelationship and dialog. In the interrelationship, the meaning of the content for the lives of the undergraduates is built, so the learning process becomes

Rev.Pemo, Fortaleza, v. 6, e10814, 2024
DOI: https://doi.org/10.47149/pemo.v6.e10814
https://revistas.uece.br/index.php/revpemo
ISSN: 2675-519X

effective and these dialogues are only possible when there is a shared language with everyone.

The process of appropriation of scientific knowledge by deaf students in higher education during the pandemic took place through their participation in the integrative nucleus and their relationship with teachers, hearing students and Libras translators, who together attended a semester remotely. Due to the pandemic, face-to-face contact was limited between everyone, and the semester, because it was remote, resulted in obstacles in the teaching and learning processes. Thus, the process of learning scientific knowledge by the undergraduate presented weaknesses.

In the course of the research, during the observations made, the didactic resource used by most of the teachers was the use of slides, some with images and the indication of a video to enrich the dialogue built up in class with the class, and these videos included screens in Libras.

The content was accessible to the deaf undergraduate present at the course and, due to the context of remote classes, there were limitations in the use of other resources to be used with the class. Therefore, it is up to the teacher to research and use creativity to adapt the content for undergraduates, including deaf undergraduates, who are visual learners.

Santos and Belmino (2013) point out that didactic teaching resources are components that are part of the educational space and that stimulate undergraduates, thus promoting the teaching and learning process, as long as they are used appropriately. According to Souza (2007, p. 111), a teaching resource "is any material used as an aid in the teaching and learning of the content proposed to be applied by the teacher to their students". The use of didactic resources in classes can make the teaching and learning process more interesting for undergraduates, so the teacher must be attentive if there are undergraduates with specific needs, often requiring adaptations, especially in the case of deaf undergraduates.

In addition to the teaching resources used in the classes, it was possible to understand which strategies the teachers used specifically for deaf students. Most of the

DOI: https://doi.org/10.47149/pemo.v6.e10814
https://revistas.uece.br/index.php/revpemo
ISSN: 2675-519X

teachers used images on the slides as a strategy, as suggested by the Libras interpreters who accompanied the students. They used images that were related to the content discussed in class, accompanied by a textual part with the concepts.

The Libras interpreters used everyday objects as a strategy to mediate with the deaf student. One of the professionals used this strategy to explain the content being explained by the teacher, in order to make the subject accessible to the student, who expressed difficulties in understanding the subject discussed in class.

4 Conclusions

Reflecting on inclusion in public higher education instigates reflections and concerns, especially when we talk about the admission of deaf undergraduates to higher education, a group of people from a historical context marked by oppression and struggles.

Therefore, getting to know this reality and how the process of inclusion of deaf undergraduates in higher education took place was one of the objectives described in this study. Therefore, promoting inclusive education requires reflection on teaching practice, the provision of Libras interpreters at university and the commitment of everyone to enhance inclusive educational practices within the university.

During the course of the research, we faced challenges that changed some of the steps. Due to the pandemic caused by Covid-19, the class observations and interviews took place remotely, with the participants involved in this research, respecting social distancing.

No decorrer do estudo, atingimos aos objetivos propostos, no qual o processo de apropriação do conhecimento científico pelo aluno surdo no ensino superior durante a pandemia aconteceu por meio de sua inserção no núcleo integrador, proposta adquirida pelos professores para possibilitar o encerramento do semestre, tendo a relação com os professores, alunos ouvintes e as tradutoras intérpretes de Libras que juntos vivenciaram aulas de forma remota.

Rev.Pemo, Fortaleza, v. 6, e10814, 2024
DOI: https://doi.org/10.47149/pemo.v6.e10814
https://revistas.uece.br/index.php/revpemo
ISSN: 2675-519X

In the course of the study, we achieved our objectives. We observed that the process of appropriation of scientific knowledge by deaf students in higher education during the pandemic took place through their inclusion in the integrative nucleus, an initiative of the teachers to guarantee the end of the semester. During this period, the deaf student interacted with teachers, hearing students and Libras interpreters, who together experienced classes remotely.

With regard to the strategies that the teachers used, specifically for the deaf student, we highlight the use of images in the slides, which were related to the content discussed in class, a strategy that met the specificity of the deaf student, the visual aspect.

The Libras interpreters used everyday objects as a strategy in the classes to mediate the content for the deaf student, an alternative they found that contributed to the student's understanding.

The deaf student reported what would be necessary for his learning, saying that materials adapted in Libras and support in the process of acquiring written Portuguese would really contribute to this process, as he had great difficulty with the language.

Regarding the deaf student's learning, the teachers reported that this process was weakened, as they noticed great difficulty with written Portuguese, as it blocked them from carrying out some activities and understanding the content.

Therefore, due to the pandemic period in which the semester took place remotely, we faced challenges in the teaching and learning processes in higher education. The process of appropriation of scientific knowledge by the deaf undergraduate presented weaknesses, and the lack of mastery of Libras by teachers and hearing students, which made direct communication with the deaf student difficult.

Thus, in order to offer inclusive teaching and adapt classes with deaf students in mind, it is urgent and necessary to offer pedagogical training for teachers and the academic community that deals with deaf students at the university. It is essential to have the support of specialized professionals who study and know the specificities of the deaf and, possibly, the deaf themselves, allowing them to express themselves and also contribute to the learning process.

References

Rev.Pemo, Fortaleza, v. 6, e10814, 2024
DOI: https://doi.org/10.47149/pemo.v6.e10814
https://revistas.uece.br/index.php/revpemo
ISSN: 2675-519X

ALMEIDA, Teresinha Fátima; VOLPE, Bruna Braga; FRASSON, Antônio Carlos. **Materiais didáticos elaborados como objetos de aprendizagem:** produtos educacionais para estudantes surdos no ensino regular. Revista do Programa de Pós-Graduação em Ensino, Universidade Estadual do Norte do Paraná Cornélio Procópio, v. 2, n. 2, p. 135-148, 2018.

BRASIL. Lei n° 10.436 de 2002. **Dispõe sobre a Língua Brasileira de Sinais - Libras e dá outras providências.** Legislação pela coordenação de estudos legislativos – CEDI, **Diário Oficial da União**, 2002.

BRASIL. Decreto nº 5.626, de 22 de dezembro de 2005. Regulamenta a Lei no 10.436, de 24 de abril de 2002, que dispõe sobre a Língua Brasileira de Sinais - Libras, e o art. 18 da Lei no 10.098, de 19 de dezembro de 2000. **Diário Oficial da União**, Brasília, DF, 2005.

CORRÊA, Jessica Roberta da Silva.; SANDER, Ricardo Ernani.; MARTINS, Sandra Eli Sartoreto de Oliveira. A percepção de universitários sobre a atuação do intérprete de Libras no ensino superior. **Revista Educação Especial**, p. 529-540, 2017.

CUNHA JUNIOR, Elias Paulino. Desafios linguísticos no ensino escolar e superior de surdos paulistanos em tempo de coronavírus. In. LIBERALI, F. C et al. (Org). **Educação em tempos de pandemia:** brincando com um mundo possível. 1. ed.– Campinas, SP: Pontes Editores, 2020.

CHIZZOTTI, Antônio. **Pesquisa em ciências humanas e sociais.** 8. ed. São Paulo: Cortez, 2006.

CRUZ, José Ildon. Gonçalves da; DIAS, Tárcia Regina da Silveira. Trajetória escolar do surdo no ensino superior: condições e possibilidades. **Revista Brasileira de Educação Especial**, v.15, n.1, p.65-80, 2009.

DORZIAT, Ana; ARAÚJO, Joelma Remígio. O Intérprete de Língua de Sinais no Contexto da Educação Inclusiva: o Pronunciado e o Executado. **Revista Brasileira de Educação Especial**, Marília, v. 18, n. 3, p. 391-410, 2012.

EMILIANO, Joyce Monteiro; TOMÁS, Débora Nogueira. Vigotski: a relação entre afetividade, desenvolvimento e aprendizagem e suas implicações na prática docente. **Revista Cadernos de Educação:** Ensino e Sociedade, Bebedouro, SP, 2015.

FACCI, Marilda Gonçalves Dias. A Periodização do desenvolvimento psicológico individual na perspectiva de Leontiev, Elkonin e Vigotski. **Revista Cadernos Cedes**, Campinas. vol. 24 n° 62, 2004.

Rev.Pemo, Fortaleza, v. 6, e10814, 2024
DOI: https://doi.org/10.47149/pemo.v6.e10814
https://revistas.uece.br/index.php/revpemo
ISSN: 2675-519X

GESSER, Audrei. Libras? **Que língua é essa:** crenças e preconceitos em torno da língua de sinais e da comunidade surda. São Paulo: Parábola Editora, 2009.

GURGEL, Taís Margutti do Amaral. **Práticas e formação de tradutores intérpretes de língua brasileira de sinais no ensino superior**. Tese (Doutorado) - Universidade Metodista de Piracicaba, São Paulo, 2010.

LACERDA, Cristina Broglia Feitosa. O intérprete de Língua Brasileira de Sinais (ILS). In: LODI, A. C. B.; MÉLO, A. D. B.; FERNANDES, E. (Org.). **Letramento, bilinguismo e educação de surdos.** Porto Alegre: Mediação, p. 373-391, 2012.

LIMA. Juliana Corrêa de. **Estratégias de ensino para acadêmicos surdos na educação superior.** Dissertação (Mestrado) – Universidade Federal de Santa Maria, Centro de Educação, Santa Maria, 2018.

MANTOAN, Maria Teresa Eglér. **Inclusão escolar:** o que é? por quê? como fazer? São Paulo: Moderna, 2003.

MARTINS, João Carlos. **Vygotsky e o Papel das Interações Sociais na Sala de Aula:** Reconhecer e Desvendar o Mundo. Série Idéias, São Paulo, n.28, 1997.

MARTINS, Lígia Márcia. **O desenvolvimento do psiquismo e a educação escolar: contribuições à luz da psicologia histórico cultural e da pedagogia histórico-crítica.** Tese (Doutorado) - Universidade Estadual Paulista Júlio de Mesquita Filho: Psicologia da Educação, São Paulo, 2011.

MARTINS, Lívia Maria Nince; LINS, Heloísa Andreia de Matos. Tecnologia e educação de surdos: possibilidades de intervenção. **Nuances:** estudos sobre Educação, Presidente Prudente - SP, v. 26, n. 2, 2015.

MARX, Karl. **Manuscrito econômicos-filosóficos**. São Paulo: Boitempo, 2004.

MOURA, Maria Cecilia; HARRISON, Kathryn M. Pacheco. A inclusão do surdo na universidade-mito ou realidade? **Revista Cadernos de tradução**, Florianópolis, v. 2, n. 26, 2010.

PABIS, Nelsi Antônia. **Metodologia da Pesquisa em Ciências da Educação II.** Guarapuava: Unicentro, 2012.

PERLIN, Gladis. Identidades surdas. In. SKLIAR, C. (Org.). **A Surdez: um olhar sobre as diferenças**. Porto Alegre: Editora Mediação, 1998.

Rev.Pemo, Fortaleza, v. 6, e10814, 2024
DOI: https://doi.org/10.47149/pemo.v6.e10814
https://revistas.uece.br/index.php/revpemo
ISSN: 2675-519X

QUADROS, Ronice Müller de. **O tradutor e intérprete de língua brasileira de sinais e língua portuguesa**. Brasília: MEC; SEESP, 2004.

SANTOS, Ovídia Kaliandra Costa; BELMINO, José Franscidavid Barbosa. **Recursos didáticos: uma melhoria na qualidade da aprendizagem**. In: Fórum internacional de pedagogia, Vitória da Conquista, 2013. Anais do V FIPED, 2013.

SOUZA, Salete Eduardo. **O uso de recursos didáticos no ensino escolar**. I Encontro de Pesquisa em Educação, IV Jornada de Prática de Ensino, 2017.

SHIMAZAKI, Elsa Midori; MENEGASSI, Renilson José; FELLINI, Dinéia, Ghizzo Neto. **Ensino remoto para graduandos surdos em tempos de pandemia.** Práxis Educativa, Ponta Grossa, v. 15, p. 1-17, 2020.

TRIVIÑOS, Augusto Nibaldo Silva. **Introdução à pesquisa em ciências sociais**: a pesquisa qualitativa em educação. São Paulo: Atlas, 1987.

VALDEVINO, Felippe Gonçalves; COSTA, Anderson Gonçalves; FREIRE, Arlane Markely dos Santos. Novos cenários e velhas disputas na educação básica no contexto da Covid-19. In. **Redes de resistência das comunidades educativas no contexto de pandemia**. Karlane Holanda Araújo; Anderson Gonçalves Costa (Orgs.), Porto Alegre, RS: Editora Fi, 2021.

VYGOTSKI, Lev Semenovich. **A construção do pensamento e da linguagem**. São Paulo: Martins Fontes, 2009.

[i] **Elisiane Alves Dias,** ORCID: https://orcid.org/0000-0001-5174-3419
Universidade Regional do Cariri (URCA)
Graduada em Pedagogia (URCA), Mestra em Educação pela Universidade Regional do Cariri (URCA), Especialista em Língua Brasileira de Sinais (FIP), e Membro do Grupo de Estudos e Pesquisas sobre Inclusão e Ensino Superior (GEPEIES).
Authorship contribution: data collection and writing.
Lattes: http://lattes.cnpq.br/1255813829980294
E-mail: elisianealves64@gmail.com

[ii] George Pimentel Fernandes**,** ORCID: https://orcid.org/0000-0003-3092-6800
Universidade Regional do Cariri (URCA)
Licenciatura em Pedagogia (UECE), Mestre em Educação pela Universidade Federal da Paraíba e Doutor em Educação pela Universidade Federal do Rio Grande do Norte. Professor do Mestrado Profissional em Educação (MPEDU) e do Mestrado Profissional Ensino de Física (SBF/URCA).
Authorship contribution: guidance and review.
Lattes: http://lattes.cnpq.br/0305242796710721
E-mail: pimentelcrato@gmail.com

Rev.Pemo, Fortaleza, v. 6, e10814, 2024
DOI: https://doi.org/10.47149/pemo.v6.e10814
https://revistas.uece.br/index.php/revpemo
ISSN: 2675-519X

[iii] Arlane Markely dos Santos Freire, ORCID: https://orcid.org/0000-0003-3929-1629
Secretaria Municipal de Educação SME/Crato-CE
Mestra em Educação pelo Programa de Pós Graduação em Educação da Universidade Federal de Campina Grande (PPGEd/UFCG). Professora da rede pública do município de Crato/CE, e Membro do Grupo de Pesquisa em Política e Gestão Educacional do Laboratório de Pesquisa em Política Educacional (LEPPE).
Authorship contribution: writing and proofreading.
Lattes: http://lattes.cnpq.br/8569031351213140
E-mail: arlanemarkely@yahoo.com.br

Responsible publisher: Genifer Andrade

***Ad hoc* expert:** Carlos Rafael Vieira Caxile and Aldemar Costa

How to cite this article (ABNT):
DIAS, Elisiane Alves; FERNADES, George Pimentel; FREITAS, Arlane Markely dos Santos. Apropriação do conhecimento científico do aluno surdo no ensino superior durante a pandemia da covid-19. **Rev. Pemo**, Fortaleza, v. 6, e10814, 2024. Available at: https://revistas.uece.br/index.php/revpemo/article/view/10814/version/9811

Received on June 5, 2023.
Accepted on February 2, 2024.
Published on May 2, 2024