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## ENVIRONMENT, DEAFNESS AND EDUCATIONAL INCLUSION: CREATION OF SIGNS IN SIGN LANGUAGE LINKED TO THE THEME OF AFFORESTATION – GOIOERÊ (PR)

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**Abstract:** This article aims to systematize some knowledge about bilingual education linked to environmental education. The research arose from professional situations experienced with deaf students at a public school in the city of Goioerê (PR). Therefore, we will characterize, bibliographically, 1. the basic principles about deafness, Brazilian Sign Language and deafness; 2. the legal and historical foundations of the deaf and the educational proposal in the education of the deaf; and 3. environmental education, Brazilian environmental legislation and the topic of urban afforestation. After diagnostic research in the field with deaf students, we sought to produce a repository of words – an online dictionary – in Sign language related to the theme “urban afforestation”, with the respective signs researched on the proposed theme.

**Keywords:** deaf; environmental education; urban afforestation/urban forests.

## INTRODUCTION

The 1990s marked the deaf community in its reconfiguration as a social movement capable of putting pressure on legislators for the recognition of their linguistic and cultural differences, thus requesting inclusive public policies linked to the educational, political, economic, cultural and social insertion of the deaf, bilingual education emerges, involving two languages in the educational context: Sign language as the first language of deaf students and Portuguese in written form as the second. We highlight Sign language in accordance with Article 1 of Law Number 10,436 of April 24, 2002:

Brazilian Sign Language is understood as the form of communication and expression, in which the linguistic system of a visual-motor nature, with its own grammatical structure,

constitutes a linguistic system for transmitting ideas and facts, originating from communities of people deaf people in Brazil<sup>1</sup>.

Therefore, sign language is conceived as visual-spatial and provides linguists with studies and analyzes relating to their respective linguistic elements, being marked by the struggle of a society based on democratic principles and the consolidation of human rights, having “its own grammar and is structured at all levels, like oral languages: phonological, morphological, syntactic and semantic<sup>2</sup>.”

Therefore, sign language is not universal. Linguistic variations are present within sign language as they occur in auditory oral language, due to nationality, regionality and culture: here reside the “regionalized” aspects that will be highlighted by us during the research. A clear example are the names given to *Manihot esculenta*. This plant, in the Brazilian Northeast, is called cassava; In the South and Southeast of Brazil, it is called cassava and, in the Center-West and North of the country, it is called cassava. In the same way that an edible plant protects this versatility in terms of nomenclature in the Portuguese language, the same can occur with the tree species from Goioerê (PR) in Sign language, which, in this region of Brazil, is named by the deaf (when these plants have a name).

In view of this, we propose an environmental education linked to the bilingual education of deaf students, providing opportunities, according to Article 225 of the Constitution of the Federative Republic of Brazil, that “everyone has the right to an ecologically balanced environment, a common good for the people and essential to healthy quality of life, imposing on public authorities and the community the duty to defend and preserve it for present and future generations<sup>3</sup>”.

1 Brazil, Law Number: 10,436, of April 24 de 2002.

2 A. Gesser, *Sign language? Que Língua é Essa? Crenças e Preconceitos em Torno da Língua de Sinais e da Realidade Surda*, 2009.

3 Brazil, *Constituição da República Federativa do Brasil*, 1988.

Challenge proposed so that in the future they can live in harmony on their Earth, identifying and knowing practices that contribute to minimizing local environmental problems and conserving the environment, compromising sustainable development. After all, you need to name what you want to conserve. In the case of deaf people, it is necessary to name, in Sign language, what they intend to preserve.

Along with this, we aim to identify theoretical-conceptual subsidies to think about this relationship between bilingual education and environmental education, linked to trees and basic concepts linked to environmental sciences. We know that urban afforestation performs numerous environmental and socio-environmental functions, including the maintenance and expansion of urban green areas, the protection of various fauna species, the well-being and quality of life of city populations; According to the Manual for Elaboration of the Municipal Urban Afforestation Plan, “[...] Urban Afforestation, also called Urban Forests, includes the various spaces in the urban fabric that can be worked with the tree element, such as: street afforestation, square, park, garden, median of streets and avenues and banks of bodies of water<sup>49</sup>”.

In this sense, we know that Sign language is the language used by deaf people; Therefore, it is worth asking: how can it be included in access to knowledge regarding existing afforestation in urban areas (a latent dimension of environmental education)? This question is pertinent to the search for possible solutions, and the idea for this research project arose as a result of pedagogical practice with deaf students from a public school in the city of Goioerê (PR), realizing that they had not assimilated the diversity of tree species existing in their municipality just like the hearing students.

This way, the activities linked to this project

4 A. Barcellos, ``Manual para Elaboração do Plano Municipal de Arborização Urbana``, 2012, p. 4

seek to help consolidate such benefits and build an inclusive environmental awareness, recognizing and respecting differences, thus giving Sign language a great role in communication in order to enable interaction and make students aforementioned participatory agents and transformers of their reality. Therefore, we propose the creation of signs in Sign language to name a group of trees in the municipality of Goioerê that do not yet have a formal or regionalized sign.

However, the operationalization of this study is linked to different processes and stages, namely: delimitation of a bibliographic reference; delimitation of research objectives; construction of a research methodology and creation of an educational product. This master's study is linked to the structuring axis: environment and society – (i) epistemologies, diversities and human formation and (ii) sustainable schools. Furthermore, it is correlated to the following Sustainable Development Goals (SDGs):

- SDG 4: 4.1 – By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education that leads to relevant and effective learning outcomes; 4.2 – By 2030, ensure that all girls and boys have access to quality early childhood development, care and pre-school education so that they are ready for primary education; 4.7 – By 2030, ensure that all students acquire the knowledge and skills necessary to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and the contribution of culture to sustainable development.

- SDG 10: 10.2 – By 2030, empower and promote the social, economic and political inclusion of all, regardless of age, gender, disability, race, ethnicity, origin, religion, economic or other condition; 10.3 – Ensure equal opportunities and reduce inequalities in results, including through the elimination of discriminatory laws, policies and practices and the promotion of appropriate legislation, policies and actions in this regard.
- SDG 13: 13.2 – Integrate climate change measures into national policies, strategies and planning.
- SDG 15: 15.2 – By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally.
- SDG 16: 16.b – Promote and enforce non-discriminatory laws and policies for sustainable development.

We argue that the establishment of an inclusive environmental education within the deaf community, to be effective, needs to consider regional aspects, educational methodologies and practices based on visualized and specialized processes and, finally, an active participation of the deaf student in the teaching process. -learning.

## GOALS

General objective: to identify deaf students from Goiás and, together with them, undertake bilingual environmental education capable of constructing signs in Sign language related to afforestation in the municipality, thus creating a repository of words interested in the denomination, in spatial-visual language, of tree species -urban areas located in the region (educational product). Specific objectives: recognize deaf students from Goioerê, in order

to identify their particularities and knowledge about content linked to urban afforestation within an environmental context; create signs in Sign language of the types of trees found that do not have an existing or regionalized denomination; develop a repository (digital resource) capable of concentrating the research results, that is, the words/denominations in Sign language constructed together with the deaf students from Goiás participating in this research.

## METHODOLOGY

The work has been developed since March 2020, within the scope of the activities of ProfCiAmb – Associate UEM. An active action between the hearing bilingual teacher (researcher and teacher of the students collaborating in this research), the deaf bilingual teacher from the participating school institution and the deaf students in the final years of Elementary and High School, in a cooperative and participatory manner, aiming at verification and promotion of knowledge linked to urban afforestation and arboreal aspects linked to cities. In view of this, a semi-structured interview was carried out with the students already appointed to collect data in line with the completion of the construction of our actions, thus favoring correlations between theory and practice seen in the field.

Due to the period experienced, given by the Covid-19 pandemic and the suspension of in-person classes in educational institutions in the state system of Paraná, the applied part of our research involved data collection stages through semi-structured interviews using the Google platform Meet. It is worth highlighting that, as a researcher and bilingual teacher of students immersed in deafness, we are certified by the Sign language Proficiency Examining Board, that is, this activity was undertaken because we are duly able to act as a translator and interpreter of

Brazilian Sign Language. With this in mind, we held “bilingual workshops” from April to June 2021, during the opening hours of the Multifunctional Resource Room – Deafness, in the afternoon – online and on the platforms already mentioned here. The classes were recorded and screen prints were taken to legitimize the actions involving the researchers mentioned.

The educational product is a material constructed with the aim of providing social, cultural, environmental and school inclusion, in particular, the education of the deaf, respecting their linguistic-cultural richness. Added to this, this construct aims to promote the idea of bilingual education with knowledge of environmental sciences. This way, in this research project we propose an educational product that is the set of expressions that make up the Sign language lexicon; a resource that aims to provide additional support to the teaching-learning processes, enabling these deaf students to assimilate and develop their ability to manipulate the knowledge acquired, and, at the same time, provide support to deaf and hearing teachers and to professional Sign language translators and interpreters.

Our proposal aimed to build an online dictionary, Urban Afforestation em Sign language, with the lexical references to tree species in the municipality of Goioerê, bringing entries corresponding to the signs, listed alphabetically. We highlight that the dictionary will be made available through a link on the Google website, with free access, thus offering convenience to deaf and hearing people, not needing to take up space as an application on the cell phone, contributing to greater linguistic inclusion of Sign language (providing regional signals researched or created and environmental concepts with their characteristics and importance, that is, information about environmental issues and their illustrations).

## RESULTS AND DISCUSSIONS

The results obtained with the application of our semi-structured interview detected the lack of knowledge in Sign language of the tree species presented, as shown in figure 1, according to the explanations of the interviewees.

We then applied “bilingual workshops”, with our educational strategy being to work on the notions of sustainability, selective collection, water resources and vegetation. We emphasize that, in the selective collection workshop, we presented the usefulness of colored recyclable bins and how each of them indicates where to place each object: 1. blue: paper and cardboard; 2. yellow: metal; 3. red: plastic; 4. green: glass.

We noticed that the students were familiar with the aforementioned trash cans, but they had many doubts and lack of knowledge about the trash, whose improper disposal can cause harm to their health, as in the case of electronic waste.

We justify that, at the end of the aforementioned workshops, we raised awareness about the creation of the sign of the Postgraduate Program in the National Network for Teaching Environmental Sciences in Sign language in this municipality associated with the research.

## FINAL CONSIDERATIONS

Considering the entire trajectory presented, our research project is important for providing deaf people with access to knowledge of environmental sciences. We know that accessibility is supported by Law Number 13,146, of July 6, 2015, in its Article 3, item I:

I –accessibility: possibility and condition of reach for use, with safety and autonomy, of spaces, furniture, urban equipment, buildings, information and communication transport, including their systems and technologies, as



Figure 1: Knowledge of deaf respondents about tree species presented in Sign language

Source: prepared by the authors, 2021.



Figure 2: Recycling

Source: prepared by the authors, 2021.



Figure 3: ProfCiAmb signal in Sign language in the municipality of Goioerê (PR)

Source: ProfCiAmb, 2021. Authors' collection.

well as other services and facilities open to the public, for public use or deprived of collective use, both in urban and rural areas, by people with disabilities or reduced mobility<sup>5</sup>.

In view of the above, it is clear that the communication used by the research proponents is also necessary due to the use of technologies that corroborate different possibilities of social insertion, achieving a breadth of interaction between the deaf and hearing linguistic community and educational inclusion with teaching and learning more dynamic and creative. This gives deaf students the opportunity to disseminate Sign language by studying existing or regionalized signs, with the focus of this research being urban afforestation. We know that technological resources provide all professionals in the field of deafness with the use of differentiated and visual methodological strategies, based on the curricular pedagogical proposal, using Brazilian Sign Language and Portuguese in written form. Furthermore, technology provides people with disabilities with information and promotes personal and social independence, in accordance with Decree Number 10,502, of September 30, 2020, in Article 2, Item V, which establishes the National Special Education Policy: Equitable, Inclusive and Lifelong Learning:

v –education policy with lifelong learning – set of measures planned and implemented to guarantee opportunities for development and learning throughout the student’s existence, with the perception that education does not only happen at school, and that learning can occur at other times and contexts, formal or informal, planned or casual, in an uninterrupted process<sup>6</sup>.

We know that deaf communities reside in geographically different locations; Thus, the use of technologies provides “communicative

insertion in many previously inaccessible daily life activities, as distance and time are shortened by the internet and new ways of relating have emerged”<sup>7</sup>. We note that, for environmental sciences and their curricular components to be assimilated by deaf subjects, communication and integration into society occurring, technologies must be visually accessible and the school environment must seek technological alternatives that favor their learning. For the region, the effect of this research project and the construction of the educational product will provide a localist impact, by eliminating communicability impediments on the part of the hearing and deaf linguistic community, referring to an in-depth study of signs in Sign language that involve linked environmental education to bilingual education – especially in the identification and naming of local tree species that did not have regionalized identifying signs. Knowing that there was respect for regionalism, covering the particularity of deaf students in the municipality of Goioerê, with their involved local culture and their own dialects.

In view of the above, the objectives proposed for this research achieved the expected results, with the student in question being able to access knowledge of environmental education through pedagogical and technological resources in Sign language. We emphasize that the methodological processes made it possible to verify, during the interview, the conception of the problem, which is the non-identification of the nomenclatures and characteristics of trees and the absence or little existence of signs in Sign language about urban afforestation. The bilingual workshops with themes focused on environmental sciences enabled discussions and analyzes of environmental problems and possible

5 Brazil, Law Number: 13,146, of July 6, 2015.

6 Brazil, Decree Number: 10,502, of September 30, 2020.

7 M. R. Stumpf, ``Educação de Surdos e Novas Tecnologias``, 2010.

solutions for environmental conservation in Sign language.

To fill these gaps, we proposed a methodology using visual resources to better understand environmental education awareness. We emphasize that the outcome of this research met the proposed general objective, however, the study had some difficulties, such as: 1. we were unable to carry out an on-site visit to have contact with the trees studied; 2. the distance with deaf students, due to the biosafety protocol, made it impossible in practice to show the cataloged trees mentioned. We emphasize that, upon returning from in-person classes, we experienced the observation of some tree species linked to this research outside the institution.

However, it was noticeable during the interview that there was no linguistic accessibility regarding arboreal aspects in the education of deaf students; In the bilingual workshops, the awareness and care necessary for sustainable development were clear. We highlight the “Bilingual Workshop – Vegetation”, which constituted a pedagogical tool for environmental education for both the deaf and hearing linguistic community on the usefulness of each mapped species. In view of the arguments presented, it is essential to be aware that the creation of an inclusive environmental education within the deaf linguistic community, to be effective, needs to consider regional aspects, curricular differentiation and, finally, promote environmental knowledge of the most persistent urban afforestation, because the deaf student is an active agent in the educational process in our society, which is currently suffering from environmental impacts of the most varied types.

The result obtained from the application of the mentioned bilingual workshops

guided us to prepare the educational product, the Sign language Urban Afforestation – Goioerê-PR dictionary, a repository of various signs in Sign language of the tree species cataloged in the aforementioned municipality and some related to environmental sciences. The development of the educational product was due to the lack of pedagogical and technological resources for the sign language under study and will greatly contribute to the teaching-learning of the students in question. The completion of this online dictionary – the construction of the website/educational product on which it will be displayed – occurs simultaneously with the writing of this article, together with the experts – programmer and digital developer – who offer technical support for its development. In fact, it is worth highlighting that the defense of the dissertation linked to the research described here took place at the beginning of October 2022.

We emphasize that, for deaf students and their teachers, our work, carried out through the Postgraduate Program in the National Network for the Teaching of Environmental Sciences at “*Universidade Estadual de Maringá*” (ProfCiAmb – Associated UEM), provided learning about the issues environmental factors necessary to reflect on how professionals in the educational field – especially those in bilingual education – deal with this issue, leading us to rethink our pedagogical practices and the importance of treating this problem with greater attention and dedication <sup>8</sup>. We know the importance of implementing public policies and specific curricular adjustments in the education of deaf people from the perspective of inclusive education, that is, actions that must be articulated and implemented to recognize their bilingual characteristics. It is in this direction that our work is directed.

8 A. A. dos S. Lustosa, Urban Afforestation as an Instrument for Environmental Education in the Continuing Training of Youth and Adult Education Teachers in the Special Modality, 2020.



Knowing that there are still challenges in relation to respect for differences, acceptance as a distinct cultural group and the elimination of communication barriers between the deaf and hearing worlds, we carried out this research in order to develop mitigation aspects linked to the process of cultural insertion, social, environmental and educational of deaf students. In other words, we hope that this research can open paths for the socio-environmental insertion of the deaf community, as well as for future research concerned with connecting and interacting between the different specificities of the deaf linguistic communities immersed in our country.

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