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RESEARCH PRACTICE IN EAD: DEVELOPMENT OF INCLUSION PROJECT

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ABSTRACT

The article addresses the growing demand for distance education (EAD), aiming to highlight its importance in promoting inclusion and universal access to quality education. It discusses its role in transforming the educational paradigm, encouraging pedagogical innovation and personalized learning. The relevance of scientific initiation (SI) and future literacy (UNESCO, 2022) is emphasized, involving the development of skills to identify, analyze, and create different possible futures, allowing individuals and organizations to better adapt to uncertainties and changes as an essential part of academic training, offering students opportunities to engage in original research and prepare for contemporary challenges. Additionally, a reflection on the development of SI in the EAD modality is presented, highlighting its importance in teacher training and knowledge production, through the investigation of theoretical frameworks to support action research conducted in a bilingual elementary school for the deaf in the port city of Paranaguá, on the coast of Paraná. This reflection underscores the importance of scientific initiation with field research activities for EAD by providing opportunities for: development of research skills, integration of theory and practice, engagement and motivation, construction of professional networks, contribution to society, and strengthening of autonomy and self-management.

Keywords: Distance learning, Scientific research, Future literacy.

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A PRÁTICA DE PESQUISA NA EAD: DESENVOLVIMENTO DE PROJETO DE INCLUSÃO INOVADOR

RESUMO

O artigo aborda a crescente demanda por educação a distância (EAD), com o objetivo de destacar sua importância na promoção da inclusão e do acesso universal à educação de qualidade. Discute-se o seu papel na transformação do paradigma educacional, incentivando a inovação pedagógica e a personalização da aprendizagem. Destaca-se a relevância da iniciação científica (IC) e do letramento de futuros (UNESCO, 2022), que envolve o desenvolvimento de habilidades para identificar, analisar e criar diferentes futuros possíveis, permitindo aos indivíduos e organizações adaptarem-se melhor às incertezas e mudanças, como parte essencial da formação acadêmica, oferecendo aos estudantes oportunidades para se envolverem em pesquisas originais e para se prepararem para os desafios contemporâneos. Além disso, apresenta-se uma reflexão sobre o desenvolvimento da IC na modalidade EAD, evidenciando sua importância na formação de professores e na produção de conhecimento, por meio da investigação do referencial teórico para subsidiar a pesquisa-ação realizada em uma escola da Educação Básica Bilíngue para surdos na cidade portuária de Paranaguá, litoral do Paraná. Percebe-se com esta reflexão, a importância da iniciação científica com atividades de pesquisa em campo para a EAD por oportunizar: desenvolvimento de competências de pesquisa, integração da teoria e prática, engajamento e motivação, construção de redes profissionais, contribuição para a sociedade e o fortalecimento da autonomia e da autogestão.

Palavras-chave: Ensino a Distância; Pesquisa Científica; Letramento de Futuros.

LA PRÁCTICA DE INVESTIGACIÓN EN LA EAD: DESARROLLO DE UN PROYECTO DE INCLUSIÓN INNOVADOR

RESUMEN

El artículo aborda la creciente demanda por educación a distancia (EAD), con el objetivo de destacar su importancia en la promoción de la inclusión y el acceso universal a una educación de calidad. Se discute su papel en la transformación del paradigma educativo, fomentando la innovación pedagógica y la personalización del aprendizaje. Se destaca la relevancia de la iniciación científica (IC) y del alfabetismo de futuros (UNESCO, 2022), que implica el desarrollo de habilidades para identificar, analizar y crear diferentes futuros posibles, permitiendo que individuos y organizaciones se adapten mejor a las incertidumbres y cambios, como parte esencial de la formación académica. Esto ofrece a los estudiantes oportunidades para involucrarse en investigaciones originales y prepararse para los desafíos contemporáneos. Además, se presenta una reflexión sobre el desarrollo de la IC en

la modalidad EAD, evidenciando su importancia en la formación de docentes y en la producción de conocimiento, mediante la investigación del marco teórico para apoyar la investigación-acción realizada en una escuela de Educación Básica Bilingüe para sordos en la ciudad portuaria de Paranaguá, litoral de Paraná. Esta reflexión revela la importancia de la iniciación científica con actividades de investigación de campo para la EAD al proporcionar: desarrollo de competencias de investigación, integración de teoría y práctica, compromiso y motivación, construcción de redes profesionales, contribución a la sociedad y fortalecimiento de la autonomía y la autogestión.

Palabras clave: Educación a Distancia; Investigación Científica; Alfabetismo de Futuros.

1. Introduction

The growing demand for distance education reflects not only the pursuit of convenience but also the need for inclusion and universal access to quality education. The distance learning modality offers a unique opportunity to expand educational horizons, reaching students in remote areas, full-time workers, and other groups facing barriers to attending in-person educational institutions. Furthermore, distance education challenges the traditional teaching paradigm, encouraging pedagogical innovation and the adoption of more interactive and personalized learning approaches, which can be tailored to the individual needs of students.

In 2021, more than 3.7 million students were enrolled in distance education courses. This figure represents 41.4% of the total. In the historical series highlighted by the research (2011 to 2021), the percentage of distance education enrollments increased by 274.3%, while in-person enrollments saw a decrease of 8.3%.

Distance Education (EAD) in Brazil has solidified its position as a significant modality within the educational landscape, providing access to education in a country of continental dimensions. According to Patrícia Lupion Torres (2009), distance education in Brazil is not merely a matter of technology, but of inclusion and the democratization of education, enabling students from diverse socioeconomic backgrounds to access quality education. The author emphasizes that distance education must be conceived beyond the simple transfer of knowledge; it should be understood as a form of pedagogical interaction and collective knowledge construction.

Decree No. 5,773, dated May 9, 2006, addresses the regulation, supervision, and evaluation of higher education institutions, undergraduate programs, and sequential courses within the federal education system.

However, despite the clear advantages of distance education, questions arise regarding how to ensure a complete and enriching educational experience, particularly concerning research and scientific initiation. The practice of scientific initiation plays a fundamental role in academic training, providing students with the opportunity to engage in original research and contribute to the advancement of knowledge in their fields of study. Therefore, it is crucial to explore effective

strategies to promote student engagement in research activities within the context of digital education, ensuring that all students have access not only to theoretical knowledge but also to scientific practice and academic investigation.

In light of contemporary challenges, it is essential to reflect on the impact of education and educational thought in building a society that promotes learning in a sustainable, just, and equitable manner. Currently, we are immersed in the development of a global digital technological society, characterized by its dynamism and intense communication, resulting in the emergence of new languages, codes, behaviors, traditions, and values. Considering these factors, education faces a series of challenges in a constantly changing world, requiring a reevaluation of society's needs concerning the redesign of learning and training.

One of the educational alternatives that seeks to promote an equitable distribution of educational opportunities is, undoubtedly, the distance education (EAD) modality. Due to its flexibility, which can accommodate the fluidity demanded by contemporary life, this educational modality experienced a 474% increase in enrollments compared to in-person education between 2011 and 2021, as highlighted by the Anísio Teixeira National Institute for Educational Studies and Research (Inep).

UNESCO (2002, p. 5) emphasizes, through the Sustainable Development Goals (SDGs), particularly Goal 4, the importance of education in today's society as a force that can contribute to social and economic development. One of the most common arguments in the literature on distance education highlights the advantages this modality offers in terms of cost-benefit analysis and its relevance as a "compensatory" educational alternative for individuals who, for various reasons, do not have access to an in-person educational system, but do not want to miss out on opportunities that higher education offers, such as scientific initiation (IC).

The practice of scientific initiation (IC) has long been firmly established within the Brazilian university system, being considered a crucial stage in a student's academic development. This is because it allows students to engage with a broad field of discovery and knowledge, and many of these students begin their academic careers through IC. This happens because the research they initiate often continues in **stricto sensu** graduate programs, such as master's and doctoral programs, leading to the formation of professors and researchers. Conducting research or engaging in scientific inquiry involves being open to deeply exploring what is often "unknown." In this sense, it is important to highlight IC as a fundamental component of higher education, as it encourages students to engage in research, serving as a formative experience for the present and fostering a broader, more meaningful future perspective.

In the context of distance education (EAD), promoting student engagement in research is crucial, as it expands their opportunities to acquire comprehensive knowledge and challenge their hard skills (technical competencies and abilities). It is worth noting that Decree No. 5,622, dated December 19, 2005, establishes the guidelines for EAD, where the didactic-pedagogical mediation in teaching and learning processes occurs through information and communication technologies, allowing educational activities to take place in various locations and at different times (BRASIL, 2005).

When reflecting on the concept of "mediation," it is often associated with the idea of "serving as an intermediary between people or groups" or, more directly, with "intervention" (HOUAISS, 2009).

Vianney (2008) highlights that the expansion of distance education (EAD) in Brazil is closely tied to public policies that promote this modality, as well as to the growing demand for higher education, especially in regions where the availability of in-person courses is limited. He notes that although this modality has democratized access to education, it still faces significant challenges, such as the need for adequate technological infrastructure and teacher training.

Von Staa (2009), in turn, contributes to the discussion by emphasizing the importance of assessment and quality in distance education. She argues that to ensure the effectiveness of distance learning, it is essential to establish rigorous evaluation criteria for both teaching processes and student learning. Von Staa also stresses the need for constant innovation in the pedagogical methodologies used in distance education, adapting to students' needs and technological changes.

Edméa Santos (2014) addresses distance education (EAD) from the perspective of pedagogical practices mediated by digital technologies, highlighting the importance of interaction and collaborative knowledge construction. Santos argues that EAD should foster a learning environment that goes beyond static content, engaging students in active and participatory practices. However, she cautions that EAD in Brazil still faces challenges related to digital inclusion, especially in contexts of social inequality where access to technology is limited.

According to Aretio (2020), EAD has evolved considerably in recent years, especially during the COVID-19 pandemic, when it became the primary means of ensuring educational continuity in many countries, including Brazil. He argues that this modality not only expanded access to education but also fostered pedagogical innovations that could benefit in-person education in the future. Aretio emphasizes the need for educational policies that ensure quality and equity in access to distance education, stressing the importance of investments in technological infrastructure and teacher training.

A recent study by Valente (2021) discusses the integration of digital technologies in distance education (EAD) and the impact of these tools on student learning. Valente argues that the pandemic accelerated the adoption of emerging technologies, such as artificial intelligence and augmented reality, in the pedagogical practices of EAD. However, he warns of the challenges related to digital inclusion, highlighting that unequal access to the internet and technological devices remains a significant obstacle, particularly in poorer regions of Brazil.

An author who has extensive experience with EAD, Garrido (2022), offers an analysis of the importance of psychopedagogical support in this modality, especially during times of crisis. She notes that the social isolation imposed by the pandemic underscored the need for more robust emotional and psychological support for EAD students. Garrido emphasizes that educational institutions must adopt more integrated approaches, considering student well-being in addition to providing quality education.

Researcher Rodrigues (2023) discusses the digital transformation in higher education and the role of distance education (EAD) in this process. He points out that EAD has been a catalyst for profound changes in the way knowledge is transmitted and assimilated. Rodrigues highlights that distance education in Brazil is moving towards a more hybrid model, where online and in-person teaching coexist and complement each other, providing a more flexible and personalized education.

It is evident that these authors offer an updated perspective on distance education in Brazil, emphasizing the impacts of the pandemic, technological evolution, and the challenges that still need to be overcome for this educational modality to continue expanding and improving its quality and inclusiveness.

In this context, it is crucial to dedicate special attention to scientific initiation (IC) in digital education, considering the significant growth of this modality in recent years, as it ensures that university students have access not only to quality education but also to all the opportunities for academic, scientific, and professional development available in in-person environments. However, an interesting reflection arises: How can we facilitate student engagement in research activities for a theoretical and scientific education within digital education proposals?

From this perspective, this article presents, in a descriptive manner, the process of developing scientific initiation conducted in the Pedagogy course in the distance education modality at the Pontifical Catholic University of Paraná. Within this approach, the aim is also to expand understanding and explore IC in the context of inclusion.

2. The Promotion and Encouragement of Research in Distance Education (EAD)

To stimulate research in Brazil, the Brazilian Society for the Progress of Science (SBPC) was established in 1948, followed by the Brazilian Center for Physical Research (CBPF), which functions as a national laboratory, in 1949. Subsequently, two important funding agencies for research were created: the National Council for Scientific and Technological Development (CNPq), founded in 1951 under Law No. 1,310, dated January 15, 1951 (BRASIL, 1951). Therefore, the objectives of the Institutional Program for Scientific Initiation Scholarships (PIBIC) under the CNPq are to "identify new talents in all areas of knowledge" (CNPq, 2010). In addition to seeking a comprehensive education, this initiative aims to contribute to the holistic development of undergraduate students and ensure their integration into the fields of teaching, research, and outreach.

Scientific Initiation (IC) is a program developed in higher education institutions (IES) that allows undergraduate students to engage in scientific research, providing technical and methodological support to their training. Upon entering the IC program, students experience activities linked to a research project, which is designed and developed under the guidance of a faculty member (SIMÃO et al., 1996).

Scientific Initiation (IC) plays an essential role in introducing undergraduate students to the foundations of academic research, embedding them within the broad and complex web of university

studies that contribute daily with new solutions and discoveries for society. Typically, this is the first experience students have with scientific research, having previously focused more on teacher-directed educational activities, such as reading, research, analysis, and presentation of assignments, as well as written exams to evaluate the knowledge acquired in their courses.

Therefore, the process of scientific initiation develops:

> [...] (a) the identification of a question or doubt that does not yet have an answer; (b) the recognition that existing knowledge is insufficient or inadequate to clarify this doubt; (c) the necessity to construct an answer to this doubt; and (d) the requirement that the answer provides evidence of security and reliability that justifies the belief that it is a good answer (preferably, that it is correct) (KOCHE, 2002, p. 30).

Another contribution of Scientific Initiation (IC) is the refinement of academic writing and reading skills, requiring students to engage in a deep and critical analysis of texts. Thus, it is understood that:

> Language is not used solely to convey information; that is, the denotative referential function of language is merely one among many. Among these, it occupies a central position in communicating to the listener the position that the speaker actually occupies or believes they occupy in the society in which they live (GNERRE, 1987, p. 3).

Scientific Initiation (IC) not only promotes study but also offers students the opportunity to develop as researchers. This involves detailed readings, field research, a deeper understanding of methodologies and textual structures, as well as the production and analysis of data and scientific dissemination:

> To the question of why we read, we will now associate a new element: it concerns how we read. If reading is a way of living, and if reading the world and reading words are intrinsically linked, each complementing the other, then how we do so is a way of ascribing meaning to life; or rather, of seeking meanings instead of accepting them as given (AMARAL; SEVERINO; PATROCINIO, 1994, p. 303).

Massi and Queiroz (2010) highlight that the activity of Scientific Initiation not only fosters the synergistic increase derived from student motivation but also from the experience of the supervising professor. This interaction and mutual cooperation ensure high-quality learning within the realm of scientific practice. Moreover, with the expansion of Distance Education (EAD), there is a growing need to promote the development and dissemination of scientific research across various fields of knowledge.

Given the importance and relevance of IC in the training of students, it is essential to structure the inclusion of EAD students (VEDOVATTE et al., 2019). To this end, the Pontifical Catholic University of Paraná (PUCPR), the institution where this research was conducted, offers

scientific initiation to all its students (both EAD and in-person). Thus, EAD students are not left out, as there is a specific Scientific Initiation Program for EAD students (PIC-EAD) aimed at promoting development and initiation into research, integrating students enrolled in online or hybrid courses into the research environment (PONTIFICAL CATHOLIC UNIVERSITY OF PARANÁ, 2024). Therefore, research in EAD creates a favorable environment for the development of innovative research, stimulates collaboration, and addresses the specific challenges of online education. Furthermore, it strengthens students' skills, provides a rich academic experience, and expands opportunities for contributions to scientific production (VEDOVATTE et al., 2019).

Therefore, Scientific Initiation (IC) provides pathways that contribute to curricular improvement. That is, it is through IC that the evaluation of course quality, teacher performance, and their academic programs can progress, allowing the IC student, even in a Distance Education (EAD) setting, to be an active collaborator in the ongoing advancement of distance education (OLIVEIRA; VERSOLATO, 2023).

3. Strengthening Bonds: Scientific Initiation in Distance Education

The university plays a fundamental role in the production and dissemination of science, culture, and technology. These pillars, represented by the activities of research, teaching, and extension, are essential for the structuring of the university. The quality of academic work, critical reflection, the theoretical development aligned with the practice of students, and the university's impact on the community are intrinsically related to the concept of inseparability, which represents the connection between Teaching, Research, and Extension.

Supporting Demo (2005), who highlights the importance of research in the teacher's formation process, it emphasizes its role in developing critical thinking and questioning abilities. The author further emphasizes that the presence of research in the teacher's daily life is fundamental for them to share it with their students. The author argues that the experience as a researcher during academic life provides future teachers with a broad worldview, contributing not only to the development of scientific knowledge but also to cognitive growth. Fostering research in distance education enhances and enriches the experience of the research supervisor and the student involved in this context. This interaction and mutual collaboration result in quality learning centered on scientific practice.

According to Suguimoto et al. (2017), despite the widespread dissemination of Scientific Initiation activities in Brazil, there are few studies addressing this theme, particularly regarding its development in the modality of Distance Education. In this regard, Decree No. 5,622 (BRAZIL, 2005) defines Distance Education as:

> [...] an educational modality in which the didactic-pedagogical mediation in the processes of teaching and learning occurs through the use of information and communication technologies, with students and teachers engaging in educational activities in various locations and times..

On one hand, Distance Education (EAD) relies on the student's willingness to study, research, and produce independently and with discipline; on the other hand, it strengthens collaborative learning through multiple activities. It aims to awaken in the individual the need to establish new modes of contact and expression with the world, no longer fitting in merely as a consumer of productions but rather as an author and producer (PARESCHI; MARTINI, 2017, p. 44).

> In this context, the role of the supervising professor is of fundamental importance as a guide and organizer of the necessary actions for the effectiveness of research. This involves discussing with the students the necessary pathways, acting as an agent in the construction of knowledge, and serving as a motivator in the pursuit of new knowledge and in addressing existing formal and textual gaps (DORSA & RECH, 2013).

In the context of Distance Education (EAD), the guidance of research does not follow the same standard as in a face-to-face environment, as contact occurs through various tools, mostly technological (such as virtual meetings and conversations on different applications), each presenting its own particularities. Although direct contact between the advisor and researcher is highly productive, the distance modality considerably expands the possibilities for investigation. This is due to the fact that geographical limitations are not an obstacle, allowing various regions of the country to participate and contribute simultaneously to data collection, thus broadening knowledge and breaking down barriers previously imposed by a lack of contact with the university.

When developing a project, students must demonstrate autonomy in the research process. This characteristic is crucial for the success of the project, encompassing its writing, production, execution, and presentation. However, this is a process where the individual assumes these responsibilities and is aware that even from a distance, the professor can assist them. Research offers students the opportunity to engage with the realities of the job market and social issues, establishing a connection between theory and practice. This factor can motivate students to explore new methods and procedures that will aid them in their future professional endeavors.

In this context, it is evident that Scientific Initiation (IC) in Distance Education (EAD) is recognized as an important opportunity; it serves as a connection between the society in which the student is situated and academia, representing a space for access to the field of research. Therefore, it is emphasized that establishing this connection is another step toward fulfilling the role of the university, both in terms of teaching and research.

Another relevant aspect of IC, as highlighted by Masseto (2003), is its contribution to improving the quality of undergraduate courses. This occurs by enabling the development of various learning skills, as well as fostering autonomy in the search for new information, documents, data, and strategies necessary for constructing scientific knowledge. IC, therefore, plays a significant role in the professional qualification of students, encouraging them to become new researchers.

Therefore, it is essential to develop pedagogical actions that allow students, even during their undergraduate studies in Distance Education (EAD), to access Scientific Initiation (IC), transitioning from the theoretical to the practical. To tackle this significant challenge, Valente's

(2003, p. 139) words encourage the use of "digital technological resources," as this will only be possible if everyone—students and teachers alike—are "open to innovations, in a constant state of learning" (KENSKI, 2012, p. 36).

4. Distance Education and Scientific Initiation: A Project for Inclusion

Living is a social endeavor, and it is in education that we observe the relevance of relationships, transforming the classroom into a teaching and learning environment understood as an ecosystem that encompasses individuals, resources, contexts, and the construction of knowledge, which occurs through interaction. Ultimately, the teaching/learning process involves those who teach, those who learn, and the relationship between them (FREIRE, 1996; Vygotsky, 1988).

Pedagogy emphasizes the significance of this relationship in the development of the individual and in the construction of the society to which they belong. Maturana and Varela (2005) reinforce this importance by stating that we can only create the world together with others and highlight that it is only through the acceptance of others alongside us that this mutual construction becomes possible. This construction of knowledge, from the university's perspective, is applied in research and, in this case, in scientific initiation.

The role of research involves interpreting the reality experienced by the community beyond the walls of the university. At this juncture, the focus of this article is on the implementation of research activities within the university through distance education. Moraes and Lima (2004) emphasize that scientific research encourages students to develop the habit of questioning and understanding their social reality, enabling them to construct arguments that guide their actions. This, in turn, leads them to share the results obtained, thus contributing to the democratization of knowledge. The process of knowledge construction largely occurs through research, allowing researchers to gain a deeper understanding of the reality in which they are embedded. Therefore:

> [...] scientific initiation contributes to discussions about research methods and serves as an important tool for articulating the relationship between research and teaching. [...] The scientific activities developed can facilitate the maturation of students, often providing them with improved academic performance (BRIDI, 2004, p. 26).

Future literacy and scientific initiation play complementary and essential roles in contemporary higher education. This literacy refers to students' ability to anticipate and adapt to the future demands of the ever-evolving workforce and society, preparing them to confront the complex challenges of the modern world. In this regard, promoting future literacy at the university involves not only the development of technical and cognitive skills but also the capacity for critical thinking, creative problem-solving, and effective communication in diverse environments.

Scientific initiation, in turn, provides students with the opportunity to engage in academic investigations and contribute to the production of knowledge in their areas of interest, fostering

intellectual curiosity, academic autonomy, and critical thinking. By combining future literacy with scientific initiation, universities can prepare students not only for the immediate challenges of the workforce but also to become engaged global citizens, capable of addressing the complex ethical, social, and environmental dilemmas of the 21st century.

This reflection presents an example of research currently underway in the city of Curitiba, Paraná, guided and executed (by the student researcher) in the city of Paranaguá, Paraná, with deaf students from a bilingual school. The project is titled "A Multidisciplinary and Interdisciplinary Approach: Education for Sustainable Development (ESD) with a Focus on Inclusion" and is linked to the CONNECT Project, which is based on the concepts of open schooling, open education, open educational resources and practices, and creative schooling.

Commencing in the second semester of 2023, the implementation process of the project encompassed a series of stages, as summarized below:

a. Development of the project proposal;

b. Preparation, execution, and evaluation of theoretical and practical activities;

c. Guidance from the professor through online meetings for reflection and collaborative construction;

d. Presentation of the project to the school's administration and teachers;

e. Implementation of the project (currently ongoing).

The project was developed in collaboration among the researcher, the advisor, and the lead teacher from the local school. The initial phase focused on the theoretical-practical construction and the search for Open Educational Resources (OER), as well as the development of adapted materials tailored to the school's context. In the second phase, the materials created were interpreted in Brazilian Sign Language (LIBRAS) to accommodate ten children aged 9 to 11, exploring the theme of water through the Sustainable Development Goals (SDGs) 6 and 14 of the 2030 Agenda, with activities involving both interdisciplinary and multidisciplinary approaches.

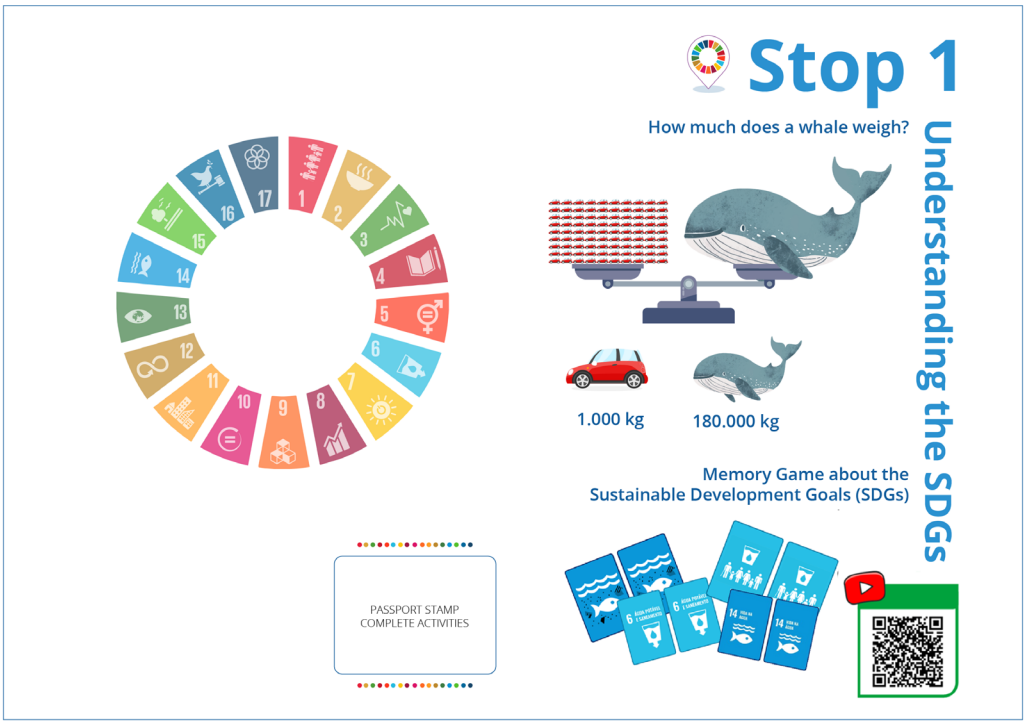
Thus, a resource was created for the teachers: an e-book (Figure 1) containing information about the SDGs and outlining the phases to be executed in the project. This material was distributed free of charge to the teachers and served as a significant support for the development and implementation of activities with the students.

Figure 1 – Understanding the SDGs (E-book in progress)

Source: The Authors, 2024.

To introduce the project's activities, a passport was created and distributed to the students. This material underwent various modifications before reaching its final product. One of these modifications addressed suggestions from the project's advisor, the lead teacher, and the students themselves, who actively voiced their opinions throughout the process. A practical example of this active listening on the part of the researcher occurred during the first meeting with the students when the question, "How do you measure a whale?" arose. This question was then adapted to be the first activity to be addressed in the project and included in the passport, as indicated in Figure 2.

Figure 2 – STOP 1 – Passport distributed to students for the activities



Source: The Authors, 2024.

It was noted that the necessary modifications to the activities not only addressed the suggestions made by the teachers (the advisor and the lead teacher) but also by the students. When education is restricted to the prescribed curriculum, it becomes an obstacle to achieving a democratic, participatory, and emancipatory transformation for the individuals involved. Therefore, it is essential to implement activities that align with students' experiences, allowing for a more comprehensive and enriching integration in the educational process (dos Reis, 2023). According to Boto (2019), active listening goes beyond the simple technical skill of hearing; it also involves an ethical and moral stance that values the individuality of others. The author argues that the practice of active listening should be continuously cultivated and refined, aiming to promote more just and respectful human relationships.

During the first semester of 2024, the effectiveness and feasibility of integrating Scientific Initiation into distance education (EAD) became evident. These contributions were previously discussed by Oliveira and Versolato (2023). The authors also elaborate on the development of quality research and the need for constant guidance as well as the autonomy granted to students in completing the predefined stages. Such factors have proven effective and demonstrate that mediation through the use of technology enables EAD students to participate in Scientific Initiation on an equal footing compared to their peers in face-to-face courses.

In this example, the activities are being conducted by the researcher, with oversight and review by the advisor, resulting in positive feedback on the field application of the stages already completed. The school, which serves as the research site, has embraced the project, recognizing the pillars of Higher Education—teaching, outreach, and research—as a benefit to all involved: students,

teachers, and the community.

Given that the project is being implemented in a bilingual school for deaf students, regular meetings with the teachers have become necessary, expanding opportunities for reflection and action. The translation of the materials into Brazilian Sign Language (LIBRAS) was carried out in collaboration with the lead teacher, who identified the research proposal as promising and intends to utilize the generated materials in subsequent years. This aligns with one of the objectives of scientific initiation: to make knowledge broad and disseminated.

5. Scientific Literacy in Brazilian Sign Language: A Challenge

One of the challenges encountered during the project brings to light the concept of scientific literacy. The National Common Curriculum Base (BNCC) is described as "a normative document that establishes a coherent and progressive set of fundamental learnings that all students must acquire throughout the stages and modalities of Basic Education" (BRAZIL, 2017, p. 7, original emphasis). One of its primary objectives is to ensure greater quality and equity in education. Its structure is based on learnings, competencies, skills, and development considered essential for a comprehensive education, aiming to build a society aligned with the ideals of justice, democracy, and inclusion. Therefore, scientific literacy, as mentioned and defined in the BNCC, is delineated as follows:

> [...] Throughout Elementary Education, the Natural Sciences area is committed to the development of scientific literacy, which involves the ability to understand and interpret the world (natural, social, and technological), as well as to transform it based on the theoretical and procedural contributions of science. In other words, learning science is not the ultimate goal of literacy; rather, it is the development of the capacity to act in and upon the world, which is crucial for the full exercise of citizenship (BRAZIL, 2017, p. 273).

In light of the definition of literacy, it has become evident that scientific literacy in Brazilian Sign Language (LIBRAS) poses a challenge, as some students have difficulties with written LIBRAS (L1) and Portuguese (L2). This barrier in concept formation for deaf students in the organization of the project revealed that the appropriation of scientific knowledge by deaf students also depends on the LIBRAS interpreter, since the deaf student uses a language different from that of the researcher.

According to Lacerda (2009), in the process of restructuring the meaning perceived by the translator or interpreter, it is essential not only to preserve the original message but also to respect the characteristics of the target language. This implies considering linguistic, cultural, and situational aspects for effective translation or interpretation. It is important to emphasize that interpretation and translation are distinct activities. Interpretation involves converting one language to another in real time during interpersonal interactions, while translation focuses on transposing written texts from one language to another (LACERDA, 2009).

Thus, the research is being built through initiatives, adaptations, and materials aimed at improving communication between knowledge and deaf individuals. Consequently, the interpreter

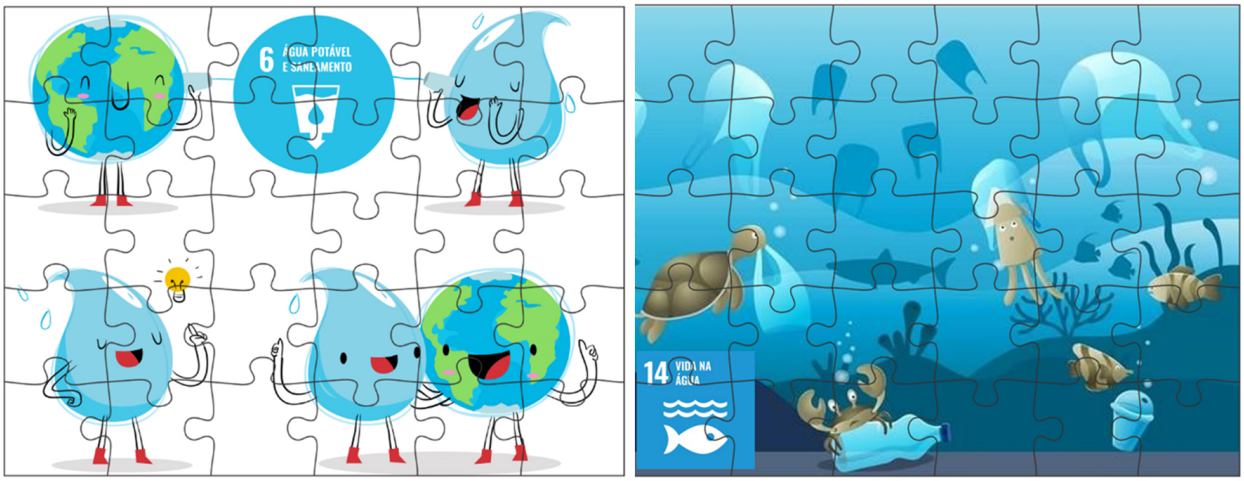
teacher becomes an important mediator in the teaching and learning process within this research. The stimulus provided by the researcher must be translated to elicit a response, and vice versa. Therefore, it is understood that scientific literacy in Brazilian Sign Language (LIBRAS) depends on the mediation and intervention of the interpreter in the relationship between scientific knowledge and the learning proposed in the project implemented by the researcher.

However, Campello (2007) discusses the case of a deaf teacher who benefits from visual pedagogy in teaching-learning processes, highlighting the need for a curricular reformulation and didactics that not only value imagery but also incorporate "visual semiotics in everyday educational practice" (p. 130). Visual pedagogy involves a practice that incorporates elements of deaf culture and sign language, such as:

> [...] educational games, involvement of artistic culture, visual culture, development of plastic, visual, and children's creativity in the visual arts, [...] conception of the world through subjectivity and objectivity with "visual experiences" (CAMPELLO, 2008, p. 129)..

The world approaches deaf individuals primarily through vision. Even for those who do not use sign language, this visual perception stands out, making sound unnecessary for them. Therefore, in order to continue developing the research and break down barriers, new games were created so that knowledge construction, in collaboration with the interpreter, can be achieved by the students. The construction of the puzzle (Figure 3) and bingo (Figure 4) was essential for the project. In the case of the puzzle, the absence of a language, whether spoken or signed, did not compromise the message, allowing students to understand the importance of SDG 6[3] and 14[4].

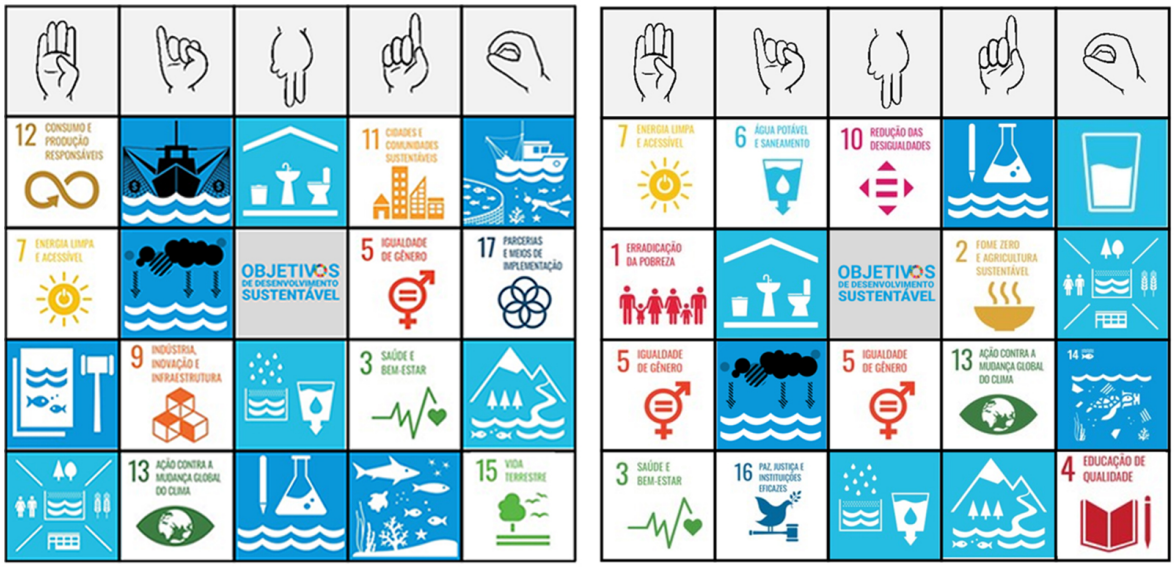
Figure 3 – Puzzle SDG 14



Source: The Authors, 2024.

3. SDG 6: Clean Water and Sanitation - Aims to ensure the availability and sustainable management of water and sanitation for all. It includes targets to ensure universal and equitable access to clean drinking water, improve water quality, increase the efficient use of water resources, and protect and restore ecosystems related to water, such as rivers and aquifers.

Figure 4 – SDG Bingo



Source: The Authors, 2024.

It is important to remember that, in Brazilian Sign Language (Libras), content should not be presented in a static and linear manner, nor should images be merely an appendix; instead, the use of this resource allows for the contextualization of the topic being addressed. The restructuring of methodologies is, after all, one of the recommended alternatives to spark interest in the school curriculum in general, especially among the deaf community (GUIMARÃES and CRUZ, 2021).

6. Final Considerations

This is a broad and critical overview of distance education (EAD) in Brazil, addressing both its advancements and the challenges that need to be overcome for this modality to continue contributing significantly to the democratization of education in the country.

Distance scientific initiation (IC) offers students the opportunity to integrate knowledge, encourages the search for new information, promotes autonomy in research and problem-solving, and awakens potential while strengthening self-confidence. Thus, this modality contributes to a holistic educational process, preparing students meaningfully for the development of their professional careers.

In the context of Distance Education (EAD), mediated by technologies, the reorientation of the process is a constant occurrence, as it brings together individuals in different spaces

4. SDG 14: Life Below Water - Aims to conserve and sustainably use the oceans, seas, and marine resources. It encompasses targets to prevent and reduce marine pollution, protect marine and coastal ecosystems, regulate fishing, and increase economic benefits for small island developing states and least developed countries through the sustainable use of marine resources.

who fundamentally depend on the support of technological resources to maintain interaction, communication, and learning. This, in turn, requires the adoption of increasingly agile and accessible tools to cater to diverse realities and, consequently, to overcome barriers and make the process more inclusive.

The project presented, as an example, highlights the importance of conducting distance research across the national territory. Students participating in the EAD modality have the opportunity to engage in guided and organized scientific knowledge production, yielding practical results and a wide range of opportunities for action and intervention in various regions of the country. In this way, the capacity for academic mobilization of a resource that circulates daily in contemporary social spheres has been underscored. At the same time, the importance of technologies for the effective development of research activities has been highlighted. This indicates that increasingly, media converge toward common goals, including in scientific practice. Living in a hyperconnected world, in an era of incessant mobility, constant change, new and diverse forms of communication, and, why not mention, new paths of knowledge production, higher education needs to be receptive to this new landscape. "As a manifestation present in vital experience, human curiosity has been historically and socially constructed and reconstructed" (FREIRE, 1996, p. 35).

The importance of future literacy and scientific initiation stands out, especially in the context of distance education. In this dynamic and complex environment, students need not only to acquire technical and theoretical skills but also to develop transversal competencies that enable them to adapt and thrive in an uncertain future.

Distance Education (EAD) offers flexible platforms that enhance the development of relevant digital competencies, allowing students to navigate different learning contexts and acquire the necessary skills to become lifelong learners. By integrating scientific initiation into this scenario, higher education institutions can prepare students not only to consume knowledge but also to produce it, equipping them to become leaders and agents of change in their communities and beyond.

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