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Articles

Professional and technological education for the Sateré-Mawé people in Andirá-Marau: contributions from Amazonian knowledge

A educação profissional e tecnológica para o povo Sateré-Mawé no Andirá-Marau: contribuições dos saberes Amazônicos

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Abstract

This article results from research on Professional and Technological Education (PTE) for the Sateré-Mawé people, articulated based on data generated during discussions in the discipline of Education in the Amazon, as part of the doctoral program in Education. The investigated theme addresses Professional and Technological Education for the Sateré-Mawé people in the Andirá-Marau Territory: contributions from Amazonian knowledge, aiming to analyze the interaction between PTE and Amazonian knowledge. To this end, the study contextualized Professional and Technological Education and explored Amazonian knowledge, highlighting its integration into the Sateré-Mawé experience. The research was conducted through interviews with professors from the Federal Institute of Amazonas (IFAM), Maués campus. Analytical and qualitative in nature, it utilized hermeneutic phenomenology, and the generated data was analyzed using Discursive Textual Analysis (DTA), following its interpretative stages. The results show that the interaction between Amazonian knowledge and educational practices, such as agroecological techniques and technological workshops, can contribute to environmental conservation and food security within the community. This interaction allowed the conclusion that education integrated with Amazonian knowledge is essential for inclusive and contextualized training, supporting the Sateré-Mawé in addressing contemporary challenges, promoting sustainability, and fostering critical environmental education.

Keywords: Amazonian knowledge; professional and technological education; indigenous peoples.

Resumo

Este artigo resulta de pesquisa sobre a Educação Profissional e Tecnológica - EPT para o povo Sateré-Mawé, articulado a partir de dados gerados durante as discussões da disciplina Educação na Amazônia, do doutorado em Educação. A temática investigada aborda a Educação Profissional e Tecnológica para o povo Sateré-Mawé no Território Andirá-Marau: contribuições dos saberes amazônicos, com o objetivo de analisar a interação entre a EPT e os saberes amazônicos. Para tanto, o estudo contextualizou a Educação Profissional e Tecnológica e explorou os saberes amazônicos, destacando sua integralização na experiência Sateré-Mawé. A pesquisa foi conduzida por meio de entrevistas realizadas com professores do Instituto Federal do Amazonas - IFAM, campus Maués. De natureza analítica e qualitativa, utilizou-se a fenomenologia hermenêutica e os dados gerados foram analisados à luz da Análise Textual Discursiva - ATD, seguindo suas etapas interpretativas. Os resultados evidenciam que a interação entre saberes amazônicos e práticas educacionais, como as técnicas agroecológicas e oficinas tecnológicas, podem contribuir para a conservação ambiental e a segurança alimentar na comunidade. Essa interação permitiu concluir que a educação integrada aos saberes amazônicos é fundamental para uma formação inclusiva e contextualizada, contribuindo com os Sateré-Mawé no enfretamento dos desafios contemporâneos, promovendo a sustentabilidade e uma educação ambiental crítica.

Palavras-chave: saberes amazônicos; educação profissional e tecnológica; povos indígenas.

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Data availability: The data generated by the research are available in PDF and Word format for consultation, if necessary.
Study conducted on Michiles Island, in the Andirá-Marau Indigenous Territory, located in the lower Amazon, Maués, AM, Brasil.

INTRODUCTION

Vocational and Technological Education plays a significant role in promoting the basic training of young people and adults "for the exercise of professions", in the development of citizens and in their subsequent insertion into the job market. However, its greatest contribution is concentrated in urban metropolises, places that house the greatest circulation of capital. Despite this predominance in large centers, Vocational Education has also expanded to other territories through Federal Institutes of Education, based on expansion policies that have enabled its implementation in municipalities with a lower volume of industrial activities, such as the state of Amazonas. In these locations, the aim is to meet other demands, especially those focused on the training of young people and adults.

Among the territories served by the Federal Institute of Education of Amazonas - IFAM, this study focuses on the municipality of Maués, analyzing Professional and Technological Education aimed at the Sateré-Mawé people in the Andirá-Marau region. The objective is to explore how Amazonian knowledge can be integrated to enhance educational processes. Thus, the central question that guides this study is: how can Professional and Technological Education integrate scientific knowledge with traditional knowledge, contributing to the cultural strengthening and sustainable development of the Sateré-Mawé people?

Cultural and educational strengthening in indigenous communities, based on traditional knowledge, promotes skills capable of strengthening regional sustainability. In this context, the general objective of this study was to analyze Professional and Technological Education based on its interaction with Amazonian knowledge.

Methodologically, the research has an analytical and qualitative character, based on hermeneutic phenomenology, using Galiazzi's Discursive Textual Analysis - ATD (Galiazzi e Moraes (2011). The study was conducted in the Lower Amazon region, municipality of Maués, specifically on Michiles Island, Andirá-Marau Indigenous Land. With the participation of professors from the Federal Institute of Science and Technology of Amazonas - IFAM, Maués Campus, directly involved in the technical course in Agroecology for indigenous youth and adults in the region. Data collection was carried out between June and September 2022, using semi-structured interviews, applied to 12 (twelve) teachers, in addition to participant observation recorded in a field diary. The interviews were recorded, transcribed and analyzed following the ATD steps: unitarization of the corpus, categorization and communication or metatext.

Based on these objectives, the text first contextualizes Professional and Technological Education and presents Amazonian knowledge, highlighting its interaction in the experience of the Sateré-Mawé people. To this end, a literature review was conducted that addressed the following main areas: Professional and Technological Education (EPT) for indigenous communities and Amazonian knowledge in the Sateré-Mawé experience. This review was essential to establish the basic concepts of this study, as well as to support the analysis and discussion of the data.

The results are discussed in three main subsections: 1 Interaction of Amazonian Knowledge and Formative Experiences, 2 Challenges Faced and 3 Contributions for Sustainable Development, ending with Final Considerations.

Professional and Technological Education - EPT for indigenous communities

Vocational and Technological Education (EPT) in Brazil dates back to the creation of the first technical and professional schools aimed at training qualified workers, designed to meet the demands of the industrial market in the 19th century. The initial milestone was the founding of the Schools for Apprentice Craftsmen, established in 1909, with the aim of offering basic and professional training to young people from less privileged classes, promoting social and economic inclusion.

Michelato (2023) presents a comprehensive analysis of the trajectory of EPT in Brazil, from the colonial period to the 2000s. The author highlights polytechnic training and its interactions with educational, social and economic policies, emphasizing the historical context of its creation.

> Thus, three months after taking office, Nilo Peçanha, following the example he had done in Rio, promulgated Decree No. 7,566, of September 23, 1909, which provided for the

> creation of Schools for Apprentice Craftsmen - EAA in the state capitals, directly linked to the Ministry of Agriculture, Industry and Commerce, created by Afonso Pena, with the final function of offering free primary professional education (Michelato, 2023, p. 76).

Throughout the 20th century, vocational education underwent numerous transformations, driven by the country's economic and social needs. An important milestone was the creation of the "Sistema S[1]" in the 1940s, which expanded the supply of vocational training, especially aimed at the industrial and commercial sectors. In addition, the founding of the Ministry of Education and Culture (MEC) in 1953 consolidated vocational education as an essential component of the Brazilian educational system.

In the 1990s, with the enactment of the Law of Guidelines and Bases for National Education (LDBEN), Law No. 9,394/1996, vocational education was reorganized, integrating it with secondary education and aligning it with basic education. This new arrangement enabled, in the 2000s, the emergence of initiatives such as the National Program for Access to Technical Education and Employment (PRONATEC) and the expansion of the Federal Institutes of Education, Science and Technology (IFs) to various regions of the country. These measures reinforced the importance of EPT, democratizing access to technical and vocational education, including for historically marginalized groups, such as indigenous peoples.

Public policies aimed at indigenous education and their implications for EPT

School education for indigenous peoples in Brazil underwent a process of redefinition, starting with the 1988 Constitution, which recognized cultural diversity and guaranteed the right to a specific, community-based, intercultural, differentiated and bi/multilingual education. The enactment of the Law of Guidelines and Bases for National Education (LDBEN) in 1996 and the creation of the Secretariat for Continuing Education, Literacy and Diversity (SECAD) in 2004 reinforced this commitment. However, to this day, indigenous school education still faces significant challenges to achieve effectiveness.

This scenario was explored in the study by Vieira (2023a), who investigated the policy of Ethnoeducational Territories in Amazonas for the implementation of Indigenous School Education. Motivated by her experience as a researcher, teacher and indigenous activist, the author addressed the non-compliance with the rights of indigenous peoples, even in the face of the existence of specific legislation. The research concluded that, despite the work of several public institutions focused on indigenous peoples in Amazonas, the rights to indigenous school education are not implemented. As a recommendation, Vieira suggests adopting the principles of the policy of Ethnoeducational Territories to ensure these rights.

In the context of professional education, public policies have sought to promote interculturality and interaction with indigenous peoples, even when facing several challenges. These initiatives represent unique opportunities to relate technical training to the sociocultural realities of these communities, promoting the integration between technical-scientific knowledge and ancestral knowledge. Examples of this include the Indigenous PRONATEC and technical courses held in indigenous communities, which aim not only at professional training, but also at strengthening and maintaining traditional knowledge. According to Menezes Ramos et al. (2015, p. 20),

> The PRONATEC Family Farmer course sought to support and encourage indigenous farmers in the region, with the aim of enhancing development focused on sustainability. This course also demonstrated the importance and need to create an organizational process to work with the products available in the region, valuing local foods and eating habits and, consequently, ensuring food security for farming families.

The PRONATEC Indigenous Program was also implemented in the Balaio Indigenous Community, in the Upper Rio Negro, through the Family Farmer course, the first Initial and

[1] System "S", a term that defines the set of organizations of corporate entities focused on professional training, social assistance, consulting, research and technical assistance, which, in addition to having their name beginning with the letter S, have common roots and similar organizational characteristics. The following are part of the S system: National Service for Industrial Training - SENAI; Social Service for Commerce - SESC; Social Service for Industry - SESI; and National Service for Commerce Training - SENAC. There are also the following: National Service for Rural Training - SENAR; National Service for Cooperative Training - SESCOOP; and Social Service for Transportation - SEST. Source: Agência Senado.

Continuing Education course (FIC) held in an indigenous community. The course reaffirms the relevance of the organizational process, focused on the sustainable use of local resources and products, strengthening the traditional diet of the region. This approach helped to guarantee food security and sovereignty for farming families.

Public policies aimed at vocational and technological education for indigenous peoples seek to integrate technical training into the cultural realities of these peoples, promoting effective interaction between technical-scientific knowledge and ancestral wisdom. Furthermore, these initiatives require curricular and methodological adaptations to respect the cultural and linguistic specificities of indigenous communities. This approach has been fundamental in the context of the Sateré-Mawé people, where technical training has been adapted to meet the cultural and social particularities of this community.

Historical and cultural context and challenges of access to Professional and Technological Education for the Sateré-Mawé people.

The Sateré-Mawé indigenous people live in a territory located in the Lower Amazon region, specifically in the Andirá-Marau Indigenous Land (Figure 1), which extends across the municipalities of Maués, Barreirinha and Parintins, covering the states of Amazonas and Pará.

Traditionally, the Sateré-Mawé are known as the "Children of Guarana", due to their history linked to the domestication, cultivation and use of guarana, a plant of significant economic and cultural importance to the people. Oliveira (2016) contextualizes the history and location of the Sateré-Mawé:

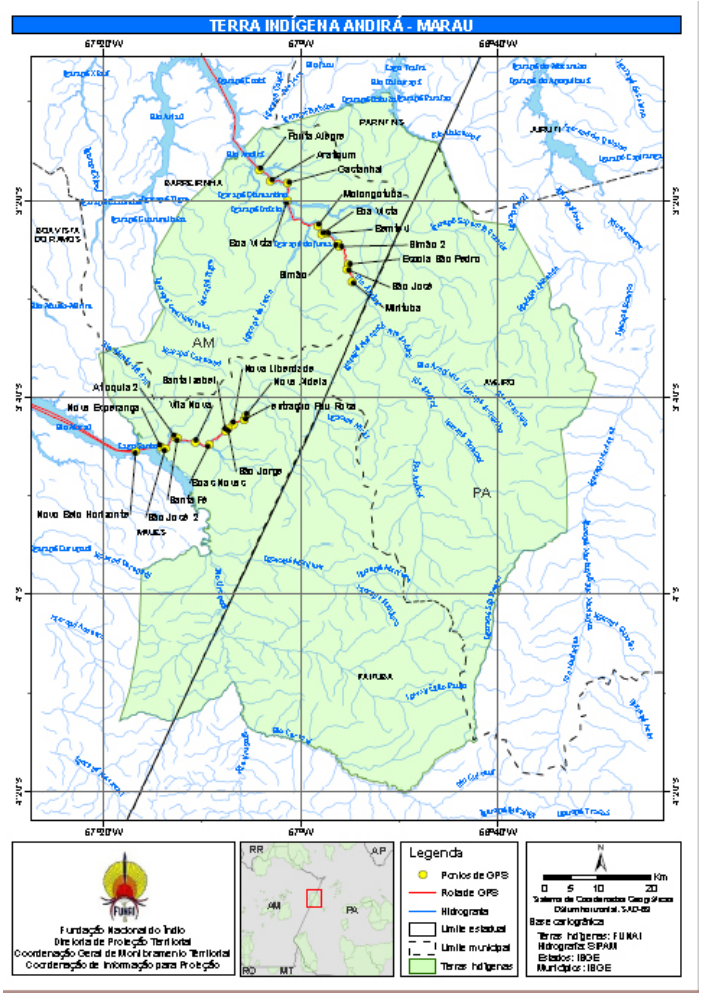

Figure 1. Andirá-Marau Indigenous Land. Source: Amazônia Real (2024).

The Sateré-Mawé people inhabit the Andirá-Marau Indigenous Land, which is located in the middle Amazon River region, on the border between the states of Amazonas and Pará. According to reports from former residents and travelers of the time, the Mawé

> had a vast territory, which extended from the Tapajós and Madeira Rivers, bordered to the north by the Tupinambarana Islands, on the Amazon River, and to the south by the headwaters of the Tapajós River. Currently, the Sateré-Mawé people occupy only a third of their original lands (Oliveira, 2016, p. 21).

The Sateré-Mawé culture is marked by oral tradition, full of mythology, stories and knowledge passed down from generation to generation. The Sateré-Mawé language, belonging to the Tupi linguistic family, is an essential element of the people's identity. Other central aspects include ritual practices, traditional festivities and a system of social organization based on clans.

Regarding access to indigenous school education, the people face the same challenges as other peoples in the Brazilian state, especially with regard to the implementation of public policies that respect their cultural, linguistic and social specificities. However, in the case of the Sateré-Mawé people, we add the existence of obstacles that create a demand for access to school education for young people and adults, considering that the schools in their communities generally only serve up to the initial years of elementary school, forcing students to seek continuity in urban areas, where the educational process often does not consider the specificities and diversities that indigenous peoples require.

Vieira (2023b) reports on the experience of the Instituto Federal do Amazonas - IFAM, which sought to promote access to Professional and Technological Education for the Sateré-Mawé people in their territory, meeting the legislative aspects of indigenous school education. This initiative integrated the traditional knowledge of the Sateré-Mawé people with modern technical knowledge, promoting contextualized and relevant education for young people and adults in this community.

Vocational and Technological Education, when adapted to cultural realities, can contribute significantly to the sustainable development of indigenous communities. Technical courses in agroecology, for example, serve as a reference by helping indigenous peoples to improve their traditional agricultural practices, increasing productivity and promoting sustainability. This approach highlights the importance of strengthening, preserving and valuing ancestral knowledge.

Therefore, Professional and Technological Education for indigenous peoples must be built on the basis of a systematic approach that integrates theory and practice, combining ancestral and scientific knowledge. It is essential that this education respects and values indigenous culture, while developing the skills and knowledge necessary to face contemporary challenges, promoting the effective integration of Amazonian knowledge.

Interaction of Amazonian knowledge and formative experiences

The ancestral or traditional knowledge of indigenous peoples comprises a set of experiences, practices and knowledge developed over generations and transmitted within communities as a way of strengthening culture. This knowledge covers a variety of aspects, such as the use of medicinal plants, political and social organization, cultural practices, agriculture and understanding of the forest. In the Amazon context, this knowledge is particularly rich and varied, reflecting the regional complexity and biodiversity.

Lima (2008, p. 7), when studying the peoples of the Amazon rainforest, especially in Acre and Pará, highlights that:

> The knowledge and practices of forest peoples energize their method, which in turn energizes their knowledge and practices, providing them with the conditions to always be investigating, innovating and always attentive to listening to the language of nature and of themselves. Thus, they are able to not only understand the complexity of nature, but, above all, feel that they are, in fact, a constituent element of it.

The dialogic interaction between indigenous knowledge and the knowledge of the surrounding society allows students to expand their knowledge and establish practical connections with the reality in which they live. In addition, traditional knowledge enriches contemporary science, providing insights for solving current challenges. This integration is essential to promote an emancipatory education that recognizes students' cultural roots and strengthens their sense of belonging to the territory.

In the case of the Sateré-Mawé people, traditional knowledge related to guarana cultivation includes not only cultivation techniques, but also cultural practices, rituals, and historical narratives that form the basis of their cultural identity. Incorporating this knowledge into formal education strengthens the value of indigenous culture while developing skills applicable in contemporary contexts.

Research by Bicalho and Costa (2022) and Vieira (2023b) demonstrates that the integration of traditional knowledge into school curricula can be implemented in a beneficial way. Bicalho and Costa (2022) investigated the technical course offered to the Tikuna people in Agriculture at the Instituto Federal do Amazonas - IFAM, Tabatinga Campus, within the scope of Youth and Adult Education - EJA and PROEJA. Vieira (2023b) analyzed the experience of IFAM in the technical course in Agroecology for young people and adults from the Ilha Michiles indigenous community, of the Sateré-Mawé people, using the Pedagogy of Alternation.

In this experience at IFAM Maués, Vieira (2023b) analyzed the formative dimension of teachers at the Instituto Federal do Amazonas - IFAM, Maués campus, through the experiences and performance of teachers in the Sateré-Mawé indigenous community on Michiles Island, in the municipality of Maués, Amazonas. The research highlighted the right to "interculturalize" pedagogical practices to the indigenous cultural context, promoting training aligned with local needs.

Cristo (2021) studied Alternating Training in the Bachelor's Degree in Rural Education at the Federal University of Amapá - UNIFAP, demonstrating how this approach, based on the principles of Rural Education, can build a transformative educational project. The results pointed to the relevance of this methodology to resist the adversities faced by Amazonian communities and promote educational practices rooted in their contexts.

Bicalho and Costa (2022) also analyzed the historical trajectory of EJA and PROEJA in the Tikuna indigenous context, highlighting the importance of educational practices that value cultural identity and promote articulations with public policies. Despite the challenges, the results indicate that indigenous school education can provide meaningful experiences by connecting students to their memories and social struggles.

Urruth (2015), when studying the Indigenous School Education Program in Acre, exemplifies how curricula that include traditional knowledge incorporate indigenous language, medicinal plants, cosmology and sustainable agricultural practices. The program involves indigenous teachers, including to mediate this interaction, promoting a bilingual and culturally relevant education.

> Currently, in the State of Acre, the Department of Education and Sports (SEE) has made this law applicable. Differentiated education for indigenous peoples and a bilingual school program with a differentiated curriculum, indigenous teachers and their training to work in indigenous schools, with the production of teaching materials in their mother tongue and the valorization and revitalization of their ethnic culture. "In the state of Acre, Indigenous School Education has been in operation since 2000, with a proposal for a dialogue of knowledge, with an indigenous education team and coordination with specificities focused on indigenous issues and demands". The production of the Political Pedagogical Project by indigenous educators became an important step in building not only what the law presents with its letters in the Portuguese language, but a sensitive reality on the part of the beings who work in the school reality in the municipalities of the interior of Acre (Urruth, 2015, p. 61).

The educational experiences highlighted confirm that the interaction of traditional knowledge in school curricula enriches the educational process and strengthens indigenous cultures. In the Amazonian context, this knowledge allows the development of inclusive and innovative pedagogies, capable of forming citizens who are aware of their cultural heritage and prepared to face contemporary challenges.

The interaction of Amazonian knowledge, as exemplified by the Sateré-Mawé people, is essential for the promotion of an inclusive and relevant education. Studies such as those conducted by IFAM and the Indigenous School Education Program in Acre highlight methodologies that respect and value traditional knowledge, creating an education that combines the best of the scientific and ancestral worlds.

METHOD

The research, for this study, used data obtained from interviews with 12 (twelve) professors from IFAM, Maués Campus, who participated directly in the technical course in Agroecology, aimed at young people and adults from Michiles Island. The interviews were semi-structured with 13 (thirteen) questions, and took place on site, between June and September 2021. The dialogues were recorded in audio, using a mobile device (smartphone) and, later, transcribed into individual files in Microsoft Word software. In accordance with the ethical requirements of the Research Ethics Committee - CEP, the names of the participants were preserved, being represented by alphanumeric codes, such as P1, for example.

Before the interviews, participants were informed about the purpose and importance of their contribution to the research. Consent was formalized through the Free and Informed Consent Form (TCLE), signed in advance.

The study is analytical and qualitative in nature, based on hermeneutic phenomenology. According to Minayo (2001), qualitative research "[...] answers very specific questions, [...] works with the universe of meanings, motives, aspirations, beliefs, values and attitudes, which corresponds to a deeper space of relationships, processes and phenomena that cannot be reduced to the operationalization of variables" (Minayo, 2001, p. 22-23).

Gadamer (1999) grounds hermeneutic phenomenology in interpretation and understanding, emphasizing the importance of history, language, art, and dialogue in the search for truth. He argues that human understanding is intrinsically linked to history and is mediated by prejudices and traditions, allowing truth to emerge through dialogue and interaction between the interpreter and the object of interpretation.

Discursive Textual Analysis – DTA, proposed by Galiazzi and Moraes (2011) to interpret data, follows specific steps: description, interpretation, argumentation and communication. Although these steps have a hierarchical organization and involve different cognitive processes, they can occur simultaneously. The phases of DTA include: Unitarization of the corpus - Fragmentation of the text into units of meaning relevant to the analysis; Categorization - Organization of these units into thematic categories that emerge from the analyzed corpus; Communication or Metatexts - Synthesis of interpretations in texts that express the conclusions of the analysis.

In the case of this research, the corpus consisted of teachers' narratives, which were systematically analyzed and interpreted to construct the analysis categories and draw the study's conclusions.

RESULTS

The data obtained and analyzed for the composition of this topic were extracted from interviews conducted with teachers from the Instituto Federal do Amazonas - IFAM, Maués campus. The objective was to analyze the interaction between Professional and Technological Education - EPT and Amazonian knowledge, embracing the subjectivities and meanings attributed to the integration of this knowledge into the EPT curriculum. Although the research included 12 teachers, the results presented were based on the responses of 8 participants, applying Discursive Textual Analysis - ATD to the research theme.

The results were discussed in three main subsections, called Initial and Final Categories (Chart 1): 1. Interaction of Amazonian Knowledge in EPT, 2. Challenges Faced and 3. Contributions to Sustainable Development, derived from the initial and final categories, as presented in Chart 1 below.

Based on the categories, the final ATD procedure was developed, called communication or *Metatext*, described below.

Interaction of Amazonian knowledge in Professional and Technological Education

Based on the categorizations, thematic groups were identified that were linked to the narratives of the participating teachers. The initial categories — Valuing Culture and Ancestry, Experience of Working with Traditional Knowledge, and Respect and Cultural Interaction — were grouped to form the final category: Interaction of Amazonian Knowledge in Professional and Technological Education.

Chart 1. Initial and final categories.

Categories	
Initial category	**Final category**
Appreciation of Culture and Ancestry	Interaction of Amazonian Knowledge in Professional and Technological Education
Deconstruction and Reconstruction of Knowledge	Challenges Faced
Implementation of Agroecological Practices	Contributions to Sustainable Development

Source: Own elaboration (2024).

The appreciation of culture and ancestral heritage was highlighted in the narrative of Teacher P12, who reported successful practices of integrating traditional knowledge into the EPT curriculum. According to the teacher, at the beginning of the first school year, guarana was used in a ritual called "*wará* [2]", which consists of consuming grated guarana in a gourd. This ritual symbolizes the sharing of knowledge and reinforces the connection with ancestral knowledge.

This act is significant because guarana symbolizes wisdom for the Sateré-Mawé people, representing a moment of sharing contemporary and ancestral knowledge. In this sense, an integrative practice is observed that reinforces the connection with Amazonian traditions and knowledge. As recorded by Rodrigues (2018, p. 406):

> The school experience under examination has proven to be an important instrument of territorialization insofar as it has become an organizing body for the community, contributing to the consolidation of identity, both its own and that of indigenous people, through the incorporation of indigenous knowledge and practices into its activities and the opening of new channels for decision-making that have impacted its forms of relationship with the environment and the symbolic dimension.

The use of wará shows how indigenous knowledge can enrich the educational context and professional and technological training, promoting a meaningful interaction between traditional knowledge and formal education. This integration enables enriching experiences, as Professor P3 highlights:

> *I think it increases respect, it also strengthens in us the feeling of protecting these people in some way, of working for them, fighting for them because they are a point of contact with traditional knowledge, whether in traditional medicine or food production, and we understand that there is still hope for our species to continue on the face of the earth, you know, because they have this knowledge, which is super important in the production of food for the world. Without them, we are very lost, especially in terms of knowledge of plants and animals in nature. So, our respect increases, the feeling of protecting the people grows in us, and it also makes us want this type of work to be expanded to other places and to create points of resistance in these territories, which I think is important* (Professor P3, 2021).

The professor's speech reinforces the importance of actions aimed at indigenous peoples, especially with regard to forest conservation, traditional knowledge, traditional medicine and production practices. This knowledge plays an essential role in supporting environmental protection and promoting sustainable relationships with the community, due to the indigenous people's deep understanding of plants, water and the forest.

Rodrigues (2018) describes that Indigenous School Education was consolidated based on legal instruments and official standards that guide the implementation of a school education that respects, values, and encourages indigenous ways of life, cultures, and languages. This respect and cultural integration were also highlighted by Professor P5, who stated: "[...] *we have to respect traditional communities, what they know, respect mainly for the culture and knowledge*

[2] It is the plant as a whole, especially the fruit and seed of the waraná, worshipped by the Sateré-Mawé, for containing the spiritual principle of "*Warán*", that is, "the explanation", "the starting point of all knowledge" (Slow Food Brasil, 2023).

they have. From the knowledge that I bring, there is a huge cultural experience that they have, and this respect for their tradition and knowledge is fundamental" (Professor P5, 2021).

The analysis of the narratives reinforces the importance of interaction and respect for Amazonian knowledge, especially in the educational context. In this scenario, methodologies and curricula that favor the connection between traditional and scientific knowledge in formal education are essential, even though they face significant challenges for the full integration of Amazonian knowledge in Professional and Technological Education.

Challenges faced

Based on the teachers' narratives, several challenges faced in the implementation of Professional and Technological Education - EPT in the indigenous context were identified, of which we highlight institutional and cultural barriers to integrating traditional knowledge and specific difficulties related to the application of the Pedagogy of Alternation.

The second category is linked to the theme of deconstruction and reconstruction of knowledge. Teachers P1 and P11 point to the Pedagogy of Alternation as one of the challenges encountered and address the need for the construction and deconstruction of knowledge. The interviewee, teacher P1, mentions that work from the perspective of the pedagogy of alternation is an experience of continuous construction and deconstruction. Following this line of thought, Cristo (2021, p. 173) states that "Training in Alternation holds great educational potential for the construction of a project based on transformative praxis". Teacher P11 adds that, through this pedagogy, he experienced a process of personal deconstruction, highlighting how the pedagogical practice proved to be effective and viable for professional and technological education applied in indigenous territory.

Teacher P11 reported that, when applying this pedagogy, he went through a process of personal deconstruction, highlighting its effectiveness in professional and technological education in indigenous territories. In addition, he pointed out respect for cultural limitations as a challenge. In his narrative, he mentioned the desire to know the "*porantim* [3]", a sacred oar that carries ancestral values for the Sateré-Mawé people. However, he realized the importance of respecting the time and limits imposed by the indigenous people themselves to access this knowledge.

Cristo (2021) points out that preliminary studies indicate the challenges to be overcome in Alternating Training. In the case of teachers in the EPT scenario for the Sateré-Mawé people, the interviewee Professor P1 talks about these difficulties, one of which is the logistical and sectoral difficulties that the work faced, highlighting that:

> *We need more staff, more teachers, not only for the teaching staff, but also administrative staff.* [...] *When we arrive in the community, like in the community of Michiles Island, we are the school itself. So, we carry the entire school, whether it is the administrative part or student assistance. Sometimes, we are there as teachers, but we end up being the school itself. This is overwhelming* (Teacher P1, 2021).

Furthermore, teachers needed to adapt to the local environment and reality. According to Cristo (2021, p. 58), "[...] adapting to the new environment means consolidating an education project. [...] The new demands are associated with factors related to the constant improvement in the quality of teaching, the scarcity of resources, and the increase in external control".

In this context, Teacher P9 expressed discomfort and frustration when dealing with unforeseen situations, since her lesson plan could not be applied to the local reality. This report highlights the lack of specific training, as the teacher did not have full knowledge about the educational work focused on Professional and Technological Education - EPT for the Sateré-Mawé people.

Similarly, Teacher P12 highlighted the lack of adequate training to work collectively and plan a course that integrated different teaching modalities. Initially, the teachers considered it unfeasible to combine high school, technical courses and, at the same time, meet the demands of Youth and Adult Education (EJA/PROEJA) and Indigenous School Education. The complexity

[3] The sacred Porantim oar. Symbolically an instrument as a totemic object for the Sateré-Mawé people, this sacred oar invokes shamanic ecstasies that provide contact with sensitive and meta-sensitive universes, through mental instruments that capture traditional knowledge (Albuquerque; Junqueira, 2017).

of combining these teaching modalities made the process extremely challenging, even in light of the recognition of the right to guarantee the specificity of indigenous schooling.

The teachers' narratives highlight a wide range of challenges, including the need to deconstruct already established concepts, adapt to new community realities, and overcome logistical and sectoral challenges, in addition to specific training to work in indigenous contexts. These factors demonstrate the importance of developing pedagogical approaches that are more aligned with the specificities of EPT in the Amazonian context, contributing to a culturally sensitive and transformative education.

Contributions to sustainable development

Popular Environmental Education is highlighted by Pereira and Zitkoski (2023) as an approach that values local and community knowledge, promoting critical and participatory educational practices. This perspective emphasizes the need to contextualize environmental educational practices, considering the cultural and social specificities of each region, and integrating ancestral knowledge into the educational process. Within the scope of Education for Sustainable Development - ESD, Pereira emphasizes that this theme is one of the most demanded in the educational context,

> However, we know that this claim has historical, cultural, social and epistemological roots and is associated with broad movements that emerged in the second half of the last century. Even though it may seem like a fashionable theme, it has been problematized for a long time by experts in the field of human sciences, as an expression of a societal project in the context of neoliberal policies, anchored in a concept of development associated with the concept of economic growth (Pereira; Zitkoski, 2023, p. 3).

Pereira and Zitkoski (2023) also argues that sustainable development should not be understood as synonymous with economic growth, a predominant view in global policies, but as an approach that encompasses social, cultural and environmental impacts. This criticism of hegemonic conceptions of development reinforces the need for practices that promote the autonomy of communities through the valorization of ancestral knowledge.

In the context of Professional and Technological Education (EPT) integrated with Amazonian knowledge, Professor P3's speech about the participation of students in a school lunch program aimed at indigenous peoples stands out. This project used regionally produced foods to serve local schools. Students of the technical course in Agroecology actively participated in the initiative, developing a life project based on regionalized indigenous school lunches, which encouraged cooperation among colleagues. This experience demonstrates the potential of educational practices to contribute to sustainable development, as long as they are critically analyzed.

Toro and Vaz's (2022) study investigated environmental education in Brazil and Colombia, highlighting the ideological currents present in public policies in both countries. In Brazil, the critical current prevails, while in Colombia the systemic current predominates. The study also pointed out ideological disputes during policy formulation and the presence of political strategies that reconcile different perspectives. These analyses reinforce the importance of understanding the different approaches for effective implementation of environmental education policies.

Aiming at sustainable practices aligned with Popular Environmental Education, Professor P6 reported a methodological experience applied during the technical course: replacing burning with agroecological clearing without burning, known as "clearing on raw land". This practice allowed indigenous students to preserve the quality of the soil and forest, avoiding deforestation and keeping fauna close to the territory. This initiative reflects an educational process that integrates modern techniques with traditional knowledge, respecting the local context. However, it is necessary to problematize how these practices interact with indigenous autonomy and resist predatory development models.

Another example was highlighted by Professor P2, who implemented technological workshops focused on sustainable production, implementing and submitting

> *He implemented and proposed for the Proex public notice a technological workshop on free-range chicken production, the result of which would be the perspective of what type of animal*

> *could be raised in the community itself... The workshop where we included the students and community members as well and then during the course we managed to implement a poultry house there with the entire community, surrounded by alternative material to what they had there and the issue of animals here, we obtained the animals and feed from extension projects in partnership with* Slow Food (Professor P2, 2021).

Although the main objective was to facilitate animal husbandry in the community, the workshop included students and local residents, respecting the principle of "communitarianism" (Brasil, 1996) of Indigenous School Education. The use of materials available in the region and the application of ancestral techniques demonstrate an effort to integrate food security and sustainability. However, it is essential to reflect on how these initiatives can be appropriated in order to strengthen the community, avoiding their absorption by neoliberal development discourses.

Bastos and Souza (2013)emphasizes the need to go beyond the rhetoric about sustainable development, emphasizing practical actions that effectively promote its objectives. He points out that the transition from theoretical discourse to concrete actions requires structural changes, planning and collective engagement.

Therefore, it is essential to adopt a critical perspective when integrating indigenous knowledge, pedagogical practices and sustainable development. This approach enables EPT to become an instrument of cultural and environmental resistance, aligned with the specific demands of Amazonian indigenous communities, while promoting transformative and sustainable educational practices.

CONCLUSION

In 2012, the Sateré-Mawé indigenous leaders began demanding a technical course for local youth and adults from the Amazonas Federal Institute of Science and Technology (IFAM), Maués campus, which sought to provide the Sateré-Mawé indigenous people with access to Professional and Technological Education (EPT) on Michiles Island, located in the Andirá-Marau Indigenous Territory, in the lower Amazon. After formalizing the request, IFAM established a committee to talk to the indigenous people, identify their needs and evaluate viable courses for the region. As a result of this process, the Technical Course in Agroecology was offered in the Indigenous PROEJA modality, considered the most appropriate to the demands presented.

In 2018, the PROEJA Indigenous Agroecology Technician course began, with an opening ceremony in the inaugural class, marking the result of years of mobilization by indigenous leaders for public policies aimed at indigenous school education integrated with Professional and Technological Education. The course was developed in the municipality of Maués/ Amazonas and structured considering the interaction between traditional knowledge and technical-scientific knowledge to develop an educational curriculum suited to the needs of the community.

Methodologically, the course was based on the Pedagogy of Alternation, an approach that allows for the alternation of theoretical and practical activities, at different times, carried out in the indigenous community itself. During the course, the Sateré-Mawé students had the opportunity to share their traditional knowledge and, at the same time, apply agroecological practices taught in class. This integration provided meaningful, contextualized learning that was directly applied to the local reality, preserving and valuing ancestral knowledge, while introducing modern cultivation techniques.

The study presented how the integration of Amazonian knowledge in Professional and Technological Education can strengthen the cultural identity of students and contribute significantly to the sustainable development of indigenous communities. Through qualitative analysis based on hermeneutic phenomenology and Discursive Textual Analysis (DTA), it was possible to identify that the incorporation of traditional knowledge enriches EPT, making it more relevant and contextualized.

The results show that the interaction of Amazonian knowledge not only strengthens the cultural identity of indigenous communities, but also plays a crucial role in promoting environmental

conservation and food security. Practices such as "roçado na terra crua" (a type of farming on raw land) and technological workshops illustrate how Vocational and Technological Education (EPT) can be innovative and sustainable when adapted to local specificities.

However, it is important to consider the conceptual tensions between Critical Environmental Education, which values ancestral popular knowledge from a perspective of resistance and social transformation, and Education for Sustainable Development, often associated with neoliberal policies aimed at economic growth. This difference in horizons highlights the need for critical reflection in the application of these practices, in order to ensure that the integration of technical-scientific knowledge and traditional knowledge respects cultural singularities and effectively promotes the emancipation of communities, without leaning towards utilitarian or hegemonic approaches.

Despite the progress, the study also revealed significant challenges, including the need for more specific training for teachers, logistical and sectoral difficulties, and institutional and cultural barriers. These challenges reinforce the importance of public policies that support indigenous school education more efficiently and respect the cultural specificities of indigenous peoples.

In short, the experience of the Instituto Federal do Amazonas in the Andirá-Marau region exemplifies how the integration of traditional and technical-scientific knowledge can create a more inclusive and sustainable education. This approach not only strengthens indigenous culture, but also empowers Sateré-Mawé youth and adults with relevant knowledge to face contemporary challenges, promoting a more sustainable future for their communities.

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Authors contribution

SCV: Design of the instrument, from its initial development to validation, as well as in the application of interviews, analysis and interpretation of data. JNS: Writing of the article. FMCC and VACMW: Assisted in the final writing of the article.

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