

**Culture and Ethnomathematics:
a teaching proposal through Takua/Taquary in the Jaguapiré village (Kaiowá People)**

Cultura e Etnomatemática:

uma proposta de Ensino através do Takua/Taquary na aldeia Jaguapiré (Povo Kaiowá)

Cultura y Etnomatemática:

una propuesta didáctica por Takua/Taquary en el pueblo de Jaguapiré (Pueblo Kaiowá)

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Abstract: In view of the devaluation of indigenous culture in our country, it becomes relevant the attempts to strengthen the indigenous tradition, in the case of this research, of the *Kaiowá* people in the Jaguapiré Village, located in the municipality of Tacuru, in the State of Mato Grosso do Sul. Therefore, the objective of this study is, based on the presentation and description of the instrument known as *Takua* or *Taquary* used by women in indigenous songs and dances, known as *Jeroky*, to present a lesson plan that articulates knowledge about geometric solids, flat figures and traditional knowledge about the *Takua*. Thus, through this qualitative research, carried out from a participant observation, in which two female leaders, knowledgeable of spiritual teachings, were interviewed and a lesson plan was built that articulates *Kaiowá* cultural knowledge and the Teaching of Mathematics, we aimed to reveal the importance of the indigenous woman of this, as well as, that it is possible to teach other mathematics through this spiritual artifact, which made it possible to highlight the relevance of facilitating the teaching and learning of students in the classroom in school spaces in indigenous communities, through the reflection of their culture.

Keywords: *Taquary/Takua*; Traditional knowledge; *Kaiowá* people; Ethnomathematics.

Resumo: Diante da desvalorização da cultura indígena em nosso país, torna-se relevante as tentativas de fortalecimento da tradição indígena, no caso desta pesquisa, do povo *Kaiowá* na Aldeia Jaguapiré, localizada no município de Tacuru, no Estado do Mato Grosso do Sul. Deste modo, o objetivo deste estudo é a partir da apresentação e descrição do instrumento conhecido como *Takua* ou *Taquary* utilizado pelas mulheres nos cantos e nas danças indígenas, conhecidas como *Jeroky*, apresentar um plano de aula que articula os conhecimentos sobre os

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sólidos geométricos, figuras planas e os conhecimentos tradicionais sobre o *Takua*. Sendo assim, por meio desta pesquisa de caráter qualitativo, realizada a partir de uma observação participante, em que foram entrevistadas duas lideranças mulheres, conhecedoras dos ensinamentos espirituais e construído um plano de aula que articula os saberes culturais *Kaiowá* e o Ensino de Matemática, tivemos em vista revelar a importância da mulher indígena deste, bem como, que é possível ensinar outras matemáticas através desse artefato espiritual, o que permitiu evidenciar a relevância de se facilitar o ensino e a aprendizagem dos alunos e alunas em sala de aula nos espaços escolares nas comunidades indígenas, por meio da reflexão de sua cultura.

Palavras-chave: *Taquary/Takua*; Conhecimentos tradicionais; Povo *Kaiowá*; Etnomatemática.

Resumen: Frente a la desvalorización de la cultura indígena en nuestro país, se vuelven relevantes los intentos de fortalecer la tradición indígena, en el caso de esta investigación, del pueblo *Kaiowá* en la Aldea Jaguapiré, ubicada en el municipio de Tacuru, en el Estado de Mato Grosso do Sul. Así, el objetivo de este estudio es presentar y describir el instrumento conocido como *Takua* o *Taquary*, utilizado por las mujeres en las canciones y danzas indígenas, conocidas como *Jeroky*, y presentar un plan de clase que articule conocimientos sobre sólidos geométricos, figuras planas y conocimientos tradicionales sobre el *Takua*. Así, a través de esta investigación cualitativa, realizada a partir de una observación participante, en la que se entrevistó a dos mujeres líderes, conocedoras de las enseñanzas espirituales, y se construyó un plan de clase que articula el conocimiento cultural *Kaiowá* y la Enseñanza de las Matemáticas, se buscó develar la importancia de la mujer indígena de este, así como, que es posible enseñar otras matemáticas a través de este artefacto espiritual, que permitió resaltar la relevancia de facilitar la enseñanza y el aprendizaje de los estudiantes en el aula en espacios escolares de comunidades indígenas, a través de la reflexión de su cultura.

Palabras clave: *Taquary/Takua*; Conocimientos tradicionales; Pueblo *Kaiowá*; Etnomatemáticas.

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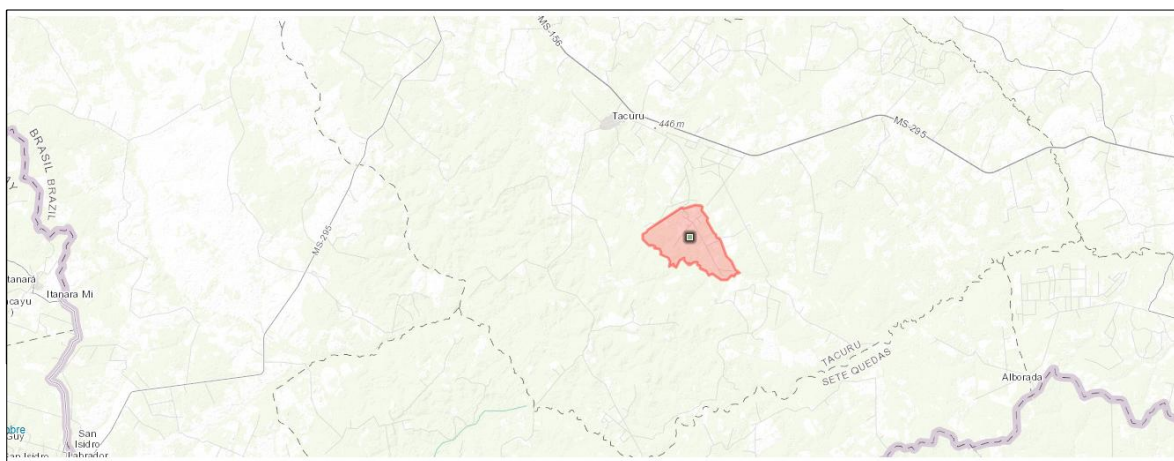
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Introduction

This article presents part of the final paper of an indigenous student of the *Teko Arandu* Indigenous Intercultural Teaching Degree course, of the Indigenous Intercultural College (IIC), who researched the *Takua*, a religious instrument, used by women in prayers, songs and dances, in the Jaguapiré village. Thus, the intention of this research was to rescue the relevance of this instrument, already forgotten by the younger people in the *Kaiowá* culture. Once the *Takua* is one of the ancestral artifacts present in the rich cultural diversity of the *Kaiowá* people, however, this cultural element may disappear if it is not valued in everyday life. Thus, we propose a mathematics activity that involves indigenous knowledge and the elements of school mathematics teaching.

The Jaguapiré Indigenous Land is located in the municipality of Tacuru, state of Mato Grosso do Sul (MS), as shown in Figure 1, has 2,342 hectares, and is traditionally inhabited by the Guarani *Kaiowá* and Guarani *Ñandeva* peoples. Its population is estimated at 1,032 people and the language spoken is Guarani *Kaiowá*. For this people, their territorial space is called *Tekoha*, a concept of which the communities are fully aware (hunting place, fruits, medicine, honey, animals, water and fish). In this sense, *tekoha* represents more than mere spaces; they are areas appropriated by human communities, that is, defined territories. These boundaries are also marked by rivers, streams, hills, and other geographical features. In Jaguapiré, these limits are established to the southwest by the Puitã River and to the northeast by the *Nhu Guaçu* River. In the northwestern part, there is a small tributary, the Jaguapiré, whose headwaters are connected by a dry line to the left bank of the Puitã River, which is a tributary of the Iguatemi (Benites, 2016).

Figure 1 – Location of the Jaguapiré Indigenous Land



Source: terrasindigenas.org.br (2024).

The colonization of the traditional land of the Kaiowá and Guarani, located near the border between Mato Grosso do Sul and Paraguay, is linked to large-scale agroextractivism and the forced displacement of indigenous peoples to the Reserves established by the Indian Protection Service (IPS) in the first decades of the twentieth century (Abreu; Mauro, 2022). Since their territory was officially recognized in 1992, it has been observed that these peoples live in an area that has suffered a considerable decrease in native forests, including springs, (Benites, 2006), thus surrounded by monoculture, and face difficulties in their agricultural production.

The history of the Guarani Kaiowá in Mato Grosso do Sul is characterized by an intense fight for the conquest of their territorial rights and the maintenance of their culture. It is undeniable that the exploitation of indigenous peoples has been taking place since the

colonial period. The projects of domination, driven by the Iberian nations, began with the arrival of the colonizers (Piubelli, 2019). European hegemonic processes transform cultural products into a single form of vision that fits the capitalist perspective, that is, the cultural, economic, and social diversity of colonized peoples has been reconfigured to serve the economic interests of global capitalism. In this way, local knowledge and ways of life that do not fit into the logic of the capitalist market are considered inferior or irrelevant, leading to cultural homogenization and the suppression of other forms of worldview (Quijano, 2005).

In this context, the Jaguapiré Indigenous Land faces the different adversities brought about by its history of land losses and repossessions. However, despite the incessant struggles, the Guarani/*Kaiowá* have never lost their ethnic-cultural characteristics, which differentiate them from other peoples. Thus, even though the aforementioned community is, as the first author of this article points out, without male and female prayers, *nhanderu* and *nhandesy*, because many of the elders ended up dying, and there is no longer *Yvyraijá* (apprentice of the prayer), this resistance so necessary for this people, persists in the elders. Thus, this research aims to reflect on the culture of these peoples as a way to keep the *Kaiowá* culture alive, through an intercultural education.

Indigenous school education

In indigenous school education, classes need to teach indigenous culture, in which respect and dialogue must be a priority. In this context, we highlight the importance of the Guarani/*Kaiowá* teachers, as they speak the Guarani language and have cultural mastery of the issues that involve the community, which provides the students' understanding.

Culturally, the Guarani *Kaiowá* indigenous people, designated in Mato Grosso do Sul as *Kaiowá* and *Ñandeva*, traditionally practice the subsistence economy, however, confined to a small region, they are unable to cultivate and provide for their families. As a result, they end up working on nearby farms and towns. This reality means that not only the forms of cultivation are learned by the youngest, but also that there is a shake-up in the family structure, as the children end up not living with their parents (Regional Indigenous Missionary Council of Mato Grosso do Sul, 2001). In this context, we highlight the role of indigenous women in maintaining their culture and the relevance of the school as a cultural dissipator.

As for the indigenous cultural aspects and their educational relevance, we perceive that in the current conjuncture there has been an incorporation of heterogeneous cultural histories to a single mode of vision, the European, in effect, "[...] all experiences, histories, resources and

cultural products also ended up articulated in a single global cultural order around European or Western hegemony" (Quijano, 2005, p. 5). Thus, in indigenous schools, cultural practices must be reinforced, as it becomes a way to avoid the historical erasure of indigenous peoples through the dissemination of a single vision, the dominant one, in Brazilian teaching models.

In the meantime, educational policies or cultural policies become relevant in the Guarani/*Kaiowá* knowledge system itself. In this search, Lourenço and Pereira (2023) highlight the organization of the Guarani and *Kaiowá* Teachers' Movement, in the late 1980s and 1990s, as actors in the procedure of claiming a more properly indigenous school. This movement, according to the authors, contested education guided by the paradigm of assimilation, based on the wording of the Federal Constitution, which marked a slow but persistent process in the need for changes in the indigenous educational system.

In this search, works such as that of Benites (2009) demonstrate the expressive involvement of indigenous teachers with the struggle for land and the maintenance of indigenous culture. From this perspective, researchers, especially indigenous researchers, recognize the strength of the elders, as a support for indigenous teachers in their formation as an intercultural educator (Lourenço; Pereira, 2023). Also according to the authors:

The cosmological principles, imprinted in the way of thinking and acting of the *Kaiowá* and Guarani people, make up a specific way of appropriating history and the contemporary world. The school is appropriated as a socially appropriate space to demand actions in an organized movement led by them, aiming at their continuity as peoples and, from a perspective of everyday life, the promotion and strengthening of their kingroups (Lourenço; Pereira, 2023. p. 4).

In this sense, when we turn our gaze to the cultural aspects of the Guarani/*Kaiowá* people of the Jaguapiré village, we can use the knowledge described by the elders related to the Ethnomathematic present in artifacts such as the *Takua* to teach students mathematical perspectives, through this very important instrument for the culture of this people.

Ethnomathematics is a field of study that explores the interrelationships between mathematics and the cultural practices of different social groups. Proposed by Ubiratan D'Ambrosio (1985), this perspective recognizes that mathematics is not a universal science detached from the context, but rather a knowledge that develops in different ways according to cultural needs and contexts. For D'Ambrosio (1985), Ethnomathematics values the knowledge produced by different peoples throughout history, emphasizing that mathematical practices are culturally situated. This understanding is particularly relevant in indigenous, quilombola, and rural communities, where everyday practices such as counting, measuring,

and geometry are constructed and passed down through generations, often without the recognition of formal school traditions.

According to Rosa and Orey (2017), Ethnomathematics also plays an important role in the educational context, as it provides an inclusive and critical approach to mathematics education. By integrating traditional knowledge and school mathematical knowledge, teachers can promote more meaningful and contextualized learning for students from diverse cultural backgrounds. This approach can contribute to the decolonization of the school curriculum, by recognizing that mathematical practices are diverse and that local knowledge has scientific value. In addition, Ethnomathematics can help build a more democratic and plural education, which respects and values the multiple ways of thinking and doing mathematics present in different cultures.

In this context, the relevance of Ethnomathematics is revealed when we reflect that there are different cultures and realities for each people. Thus, according to Oliveira (2020, p. 27), "[...] we must broaden our views to other mathematics", that is, the perspective of Ethnomathematics helps to understand the reality of indigenous school education in Mathematics Teaching, especially in the context of the Guarani/Kaiowá communities, which are culturally distinct and have their own characteristics with their own challenges and perspectives.

Soon,

[...] Ethnomathematics focuses on the idea of seeing Mathematics as a cultural manifestation and is associated with the teaching of this Mathematics, which has the possibility of meaningful and contextualized learning, valuing the culture and experience of those involved, seeking to associate them with the syllabus and involving cultural themes in school and social processes (Ribeiro, 2022, p. 23).

Thus, looking at other ways of teaching mathematics is to make room for diversity in school education. Therefore, we emphasize that indigenous students learn differently from non-indigenous students, from this perspective, the latter should learn in a different space and time from non-indigenous people. For this reason, the indigenous school must be well organized, with a differentiated education to distinguish itself from the form of teaching by assimilation.

Like this, there is a need in the indigenous school to contextualize the contents of the academic curriculum with the cultural aspects of the native peoples, so in this article we use the knowledge of the elders about *Takua* to elaborate a class on geometric shapes.

For the indigenous people of the Jaguapiré community, the *Takua* or *Takuary* instrument is very important, it is used by women, called *ñande Ypy*. This artifact used in prayers and dances is made of bamboo (*takua*). In its manufacture, the bamboo is cut, according to its size, then it is drilled, in the last thatch it cannot be drilled because only then will the sound come out, then it is left to dry, so as not to be heavy when used. Once dry, the instrument can be painted with annatto.

In this scenario, we will demonstrate the methodological aspects and results of this research that involved an important Guarani/Kaiowá indigenous instrument in the Teaching of Mathematics.

Methodological aspects

In view of the reality of the Jaguapiré community, in which it is observed that many women have stopped playing *Takua* or *Takuary*, because nowadays men and women use the rattle in prayers and dances, we seek to demonstrate that *Takua* or *Takuary* can be used in Mathematics classes.

Thus, based on a case study, which according to Triviños (1987, p. 133, emphasis added), "[...] it is a category of research whose object is a unit that is analyzed in depth", the choice of this theme happens because in the aforementioned village, the first author of this article realizes that the younger people are almost forgetting their culture, with some who still pray and dance, but they are few and from what was perceived there are not many women playing *Takua* or *Takuary*. In this way, the possibility of working with students mathematically was verified, teaching the precepts of the Ethnomathematics program and the importance of this traditional knowledge to strengthen Indigenous School Education.

The research began with an interview with two elderly women of the community, named A (70 years old) and B (78 years old), respectively. It is characterized, according to Minayo (2009), as a participant observation, which allows the researcher to immerse himself in the field of study, allowing the understanding of social interactions in a more organic and less structured way.

Interview about *Takua* with women leaders

In the interview with elder A, she revealed to us that as an upy ñandesy, she uses the *Takua* or *Takuary* instrument to play in the dances, while the men use mbaraka

(rattle). During the research, the elderly woman said that in the past, women only used *Takua*, made of bamboo (Figure 2), because *ñandesy upy* should only use this artifact to pray and dance, because the rattle was an instrument used by men (*Nhanderu Guassu*). Thus, he said that the woman who plays this instrument, usually painted with annatto (in Guarani *yrucu*), has to have the *Takua* made just for her and no one can touch it, except her husband. To play this instrument, all women must beat the floor together, rhythmic, so playing it requires practice.

Figure 2 – Leadership *takua* plantation



Source: The authors, 2024.

The elderly reported that in the past the woman did *Jehovasa* (modes of protection) with *Takua*, because when they saw a storm brewing they would play the *Takua*, chanting *nhembo'e* (prayer) so that it would pass quickly. According to the old woman, at that time women wore a skirt called *tupai*, made of cotton, very warm, at the waist they wore the *kuakuaha*, and on the head the *jeguaka* (headdress).

In view of what was highlighted by the old woman, we realize that nowadays many traditions have been left aside, as women have replaced the skirts (*tupai*) with pants like the men's and no longer play the *Takua*, cut as highlighted in Figure 3, but the rattle.

Figure 3 – Cutting the takua according to the measurements of the community leaders



Source: The authors, 2024.

The old woman reported that she uses *Takua*, because she always plays and sings before going to sleep, so she does *Jehovasa* and sleeps. When he does not perform this ritual at night, he wakes up before sunrise, around 5 am, playing and singing for *tupã*.

According to the interviewed, *Takua* must be made by a skilled person, otherwise it can break or not emit sound, and can be made by both men and women. During the making of the *Takua* artifact (Figure 4), elder B pointed out in her interview that in the past only the *nhandesy* (prayers) used this instrument in the prayer ceremonies.

Figure 4 - Old woman making *Takua*



Source: The authors, 2024.

As highlighted by Elder B, the right time to remove the bamboo for the making of *Takua* is at the full moon. According to her, the material used has to be an old bamboo (well developed), only then will it last a long time. As for planting, this should be carried out on the full moon, because according to elder B: "[...]If a person plants bamboo on the new moon, the animals will feed on it on the ground, and it dries up and does not grow."

Also according to her: "[...] Indigenous person who cuts bamboo can be a woman or even a man", for this, they measure the height of the piece to be cut at the height of the woman's waist. Therefore, to make the holes, it is necessary to count after the third knot, that is, the final part of the bamboo (Figure 5).

Figure 5 - Leadership with his *Takua* instrument



Source: The authors, 2024.

We perceive here that the relationship between the Guarani/ *Kaiowá* and the *takua* (bamboo) transcends its merely practical use, extending to social, economic and spiritual aspects. In a practical context, *takua* serves as a fundamental material for the construction of traditional Guarani dwellings. The flexibility and resistance of this plant make it ideal for the manufacture of light structures, however robust, capable of withstanding the inclement weather characteristic of the region. In addition, bamboo plays a crucial role in the making of utensils and tools used by the Guarani in their daily activities, from baskets to agricultural tools, the versatile use of bamboo demonstrates its importance in subsistence and in the practice of traditional activities, contributing to the autonomy and sustainability of the Guarani people.

From an economic point of view, bamboo is also important in generating income for the Guarani communities. The skill in making handicrafts with bamboo allows the commercialization of these products, providing a source of financial resources that helps to face the contemporary challenges faced by indigenous peoples. However, the importance of bamboo for the indigenous people goes beyond the practical and economic aspect. In the worldview of these people, nature is sacred, and bamboo, as an integral part of it, is considered a divine gift. Spiritual traditions and ancestral rituals often involve the symbolic use of bamboo, reinforcing the spiritual and cultural connection between the Guarani people and the environment that surrounds them.

Thus, in the face of the challenges faced by indigenous peoples in contemporary times, the preservation of bamboo and the promotion of sustainable practices are crucial. Valuing this natural resource not only safeguards traditions and ways of life, but also contributes to environmental conservation and the maintenance of cultural diversity, aspects intrinsically intertwined in the Guarani's worldview. Thus, bamboo is not only a useful plant for the Guarani/Kaiowá people, but an essential element that permeates their existence, sustaining not only their dwellings and livelihoods, but also their traditions, values, and spiritual connection with nature. Preserving bamboo is preserving the identity and harmony of these people with the environment that they have called home for centuries.

The interview with elder B also revealed a lot about the history of the people of the Jaguapiré village, according to her, the territory was conquered through a lot of fight with the farmers. The elderly woman and her family initially lived in the territory between the 1940s and 1950s, a time when threats from farmers made them go to a place called Jepopete. However, for unclear reasons the stay in this place did not work out and the indigenous people went to a place called Jukeri, the community stayed in this place for 10 years, then being taken to a place called Ramada, where they stayed for 30 years.

The return of the community to Jaguapiré occurred in the 1980s, as reported by the interviewee, in the retaking of land, the elders fought hard for a period of 10 years, to protect themselves against the firearms they used their bows, arrows and *yvyra*. During this period the indigenous people hunted and fished for their food, as time went by, they began to make their gardens, but at night they did not sleep for fear of being attacked by the farmers. Even though they reestablished themselves in the community in 1980, in 1985 there was an eviction, at that time, according to the elder, the farmers arrived at the repossession with their gunmen, set fire to the houses, destroyed everything and expelled everyone.

The eviction and resumption periods occurred three times, in acts of violence in which men were tied to boards and trampled on, women hung from trees and children thrown to the ground. After many struggles, the Jaguapiré village was recognized by the courts in 1990.

As highlighted by the Regional Indigenous Missionary Council of Mato Grosso do Sul (2001), the lands demarcated in the 1980s and 1990s were retaken by the indigenous people with the participation of all members of the community, men, women and children, after this process the leaders were organizing the tekoha, a sacred place where the Guarani/Kaiowá way of being can be exercised. Thus, in 1992, the Jaguapiré village was ratified by presidential decree, characterizing it as traditionally and permanently occupied by indigenous people, delimiting their territory (Brasil, 1992).

In view of these reports brought by the elders, we can observe through this study the importance of Guarani/*Kaiowá* women in maintaining the culture of this people. In the past, indigenous women got married, after having children they took care of them and the house, helping their husbands in the fields, they did not study because there was no school in the village, so many of the older indigenous women do not know how to read or write. However, with the implementation of schools in the villages, some of these women had the opportunity to study and can fight for their rights and the rights of their traditional people.

We realized in the face of this research that indigenous women have been recognized as leaders in their community, occupying their space in society, thus, we observed women, like the interviewees, fighting for the non-death of their people's culture. Such a perspective is revealed when we face that, "[...] When it comes to a policy for life, [...] women have a fundamental role in the existence and resistance of their relatives." (SOUZA, 2023, p 31).

The Training of Indigenous Teachers

A formação de professores indígenas no Brasil é um tema de extrema importância, considerando a vasta diversidade cultural e linguística presente nas comunidades indígenas do país. Esse processo é essencial para garantir uma educação escolar indígena que respeite e valorize as particularidades culturais desses povos, promovendo um ensino intercultural que ajude a manter e fortalecer suas identidades.

The training of indigenous teachers in Brazil is an extremely important topic, considering the vast cultural and linguistic diversity present in the country's indigenous communities. This process is essential to ensure an indigenous school education that respects

and values the cultural particularities of these peoples, promoting intercultural teaching that helps maintain and strengthen their identities.

Historically, indigenous education in Brazil has been marked by an assimilationist vision, in which the school served as an instrument of acculturation, seeking to integrate indigenous peoples into national society, often to the detriment of their own cultures and mother languages. The Federal Constitution of 1988 (Brasil, 1998) represented a turning point by recognizing the rights of indigenous peoples to their social organization, customs, languages, beliefs and traditions, ensuring them a differentiated and intercultural school education.

The 1996 Law of Guidelines and Bases of National Education (BNE) reinforced these rights, providing for the provision of an indigenous school education that respects ethnic and cultural diversity (Brasil, 1996). The creation of the Indigenous Teacher Training Program (ITTP), in 2005, by the Ministry of Education (MEC), was a significant step in this direction, with the objective of providing initial and continuing training for indigenous teachers.

However, the training of indigenous teachers faces several structural, cultural and pedagogical challenges. Structurally, many indigenous schools still suffer from the precariousness of their infrastructure, the lack of specific teaching resources and the insufficiency of continuous and effective public policies. Culturally, it is necessary that teacher training respects and incorporates traditional knowledge and mother languages. Many training programs are still based on a Westernized perspective, disregarding the richness of indigenous knowledge and their own forms of teaching and learning. Thus, it is essential to develop curricula that dialogue with indigenous cultures, promoting a truly intercultural education.

Pedagogicamente, a formação de professores indígenas deve prepará-los para atuar em contextos bilíngues e multilíngues, desenvolvendo metodologias que valorizem e utilizem as línguas indígenas como ferramentas de ensino. Além disso, é fundamental que os professores indígenas sejam capacitados para atuar como mediadores culturais, capazes de transitar entre os saberes tradicionais e os conhecimentos escolares.

Pedagogically, the training of indigenous teachers should prepare them to work in bilingual and multilingual contexts, developing methodologies that value and use indigenous languages as teaching tools. In addition, it is essential that indigenous teachers are trained to act as cultural mediators, capable of moving between traditional and school knowledge.

Apesar dos desafios, tem havido avanços significativos na formação de professores indígenas no Brasil. As políticas públicas voltadas para a educação indígena, embora ainda insuficientes, têm se consolidado ao longo dos anos. Programas como o ITTP e a criação de cursos de licenciatura intercultural em várias universidades brasileiras representam importantes iniciativas para a formação específica de professores indígenas.

Despite the challenges, there have been significant advances in the training of indigenous teachers in Brazil. Public policies aimed at indigenous education, although still insufficient, have been consolidated over the years. Programs such as ITTP and the creation of intercultural teaching courses in several Brazilian universities represent important initiatives for the specific training of indigenous teachers.

In summary, the training of indigenous teachers in Brazil is a complex and multifaceted process that requires an integrated approach that is sensitive to the cultural and linguistic specificities of indigenous peoples. While the challenges are significant, the advances achieved in recent decades demonstrate a growing commitment to valuing cultural diversity and promoting intercultural education. It is essential that public policies continue to invest in the initial and continuing training of indigenous teachers, expanding and strengthening existing programs. Universities and other higher education institutions should develop curricula that dialogue with traditional indigenous knowledge, promoting training that is both academically and culturally relevant.

Only through teacher training that respects and values the cultural specificities of indigenous peoples will it be possible to guarantee an education that contributes to the maintenance and strengthening of their identities, promoting the construction of a fairer and more inclusive society.

In this scenario, teacher training in a context of interculturality is a theme that aims to integrate the cultural diversity present in classrooms, promoting respect for differences and valuing the traditional knowledge of different peoples. According to Repetto (2019, p. 71): "[...] the debate on interculturality is associated with indigenous peoples, who are not foreign populations, but an original population that inhabited the continent before the colonization process and the subsequent formation of the current National States". According to the author, this perspective is very interesting to understand the specificities of Latin American countries.

In this sense, in an increasingly multicultural scenario, it needs to go beyond traditional teaching techniques, integrating approaches that contemplate cultural diversity as a pedagogical tool. Thus, Repetto and Silva (2016) highlight that the teacher needs to be prepared to deal with plural contexts, understanding that education goes beyond the

transmission of formal content and is inserted in a broader sociocultural context, where knowledge from different cultures can be incorporated into the school curriculum.

Thus, intercultural teacher training is a fundamental process for the education of indigenous teachers, as it respects and integrates the cultures, knowledge and practices of native people in their educational contexts. Therefore, intercultural training should not only include the traditional contents of formal education, but also value local and community knowledge. This contributes to a pedagogical practice that questions Eurocentrism and promotes a more inclusive and plural education. In this way, the teacher trained in this model can act as a mediator between traditional knowledge and school content, building bridges between different ways of seeing and interacting with the world (Repetto; Silva, 2016).

In this sense, the concept of interculturality gains centrality in teacher training. Baniwa (2006) argues that interculturality should be a two-way street, in which both traditional cultures and hegemonic culture can dialogue on an equal footing. For him, intercultural education should not only be for indigenous peoples, but for the whole society, so that everyone can understand and value the cultural richness of indigenous peoples and other traditional communities. This implies rethinking the role of the teacher as a mediator of different knowledge and realities, favoring the dialogue between traditional knowledge and Western scientific knowledge.

Thus, Baniwa (2006) emphasizes that an intercultural education requires a reformulation of the very concept of knowledge, expanding it to include ancestral and community knowledge. Therefore, teacher education, especially in indigenous contexts, should enable teachers to understand and transmit the values, cosmology, and cultural practices of their peoples, while critically appropriating Western knowledge. In this way, the teacher becomes a facilitator of the process of strengthening the identity and autonomy of communities, contributing to the construction of an education that is both inclusive and transformative.

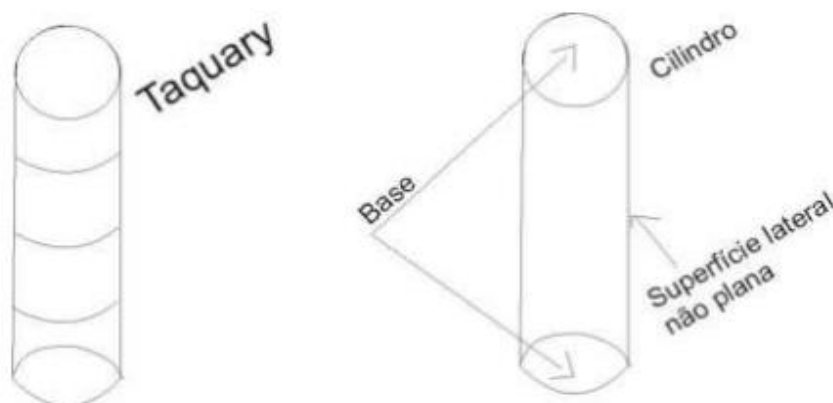
In view of these discussions, based on the assumption that it is necessary to strengthen the indigenous culture of the Guarani/*Kaiowá* people and that this possibility exists through a school education focused on a differentiated Mathematics Teaching, conditioned by a teacher training that is concerned with the cultural formation of the students, we elaborated from the interview carried out with the leaders of the Jagapiré community an intercultural lesson plan aimed at valuing the *Takua* artifact, with the intention of sensitizing and strengthening the traditional Guarani/*Kaiowá* culture, especially among women.

To teach mathematics through *Takua* or *Takuary* in the Jaguapiré village

Observing the cultural relevance of the *Takua* instrument for the Jaguapiré indigenous community, we will present below a lesson plan related to geometric concepts.

The theme of this plan is: "To teach mathematics through *Takua* or *Takuary* in the Jaguapiré village". Thus, its objective is articulated with the need to strengthen the indigenous culture of the Guarani/*Kaiowá* people, through differentiated mathematics classes. In view of this, the lesson plan is justified by the cultural strengthening of the Jaguapiré community. According to the methodology, for the presentation of the instrument, it is necessary to work in the classroom on the observation of the *Takua* or *Takuary* instrument, performing with the students the planning of the geometric object and identifying it as a cylinder and a round body, as shown in Figure 6.

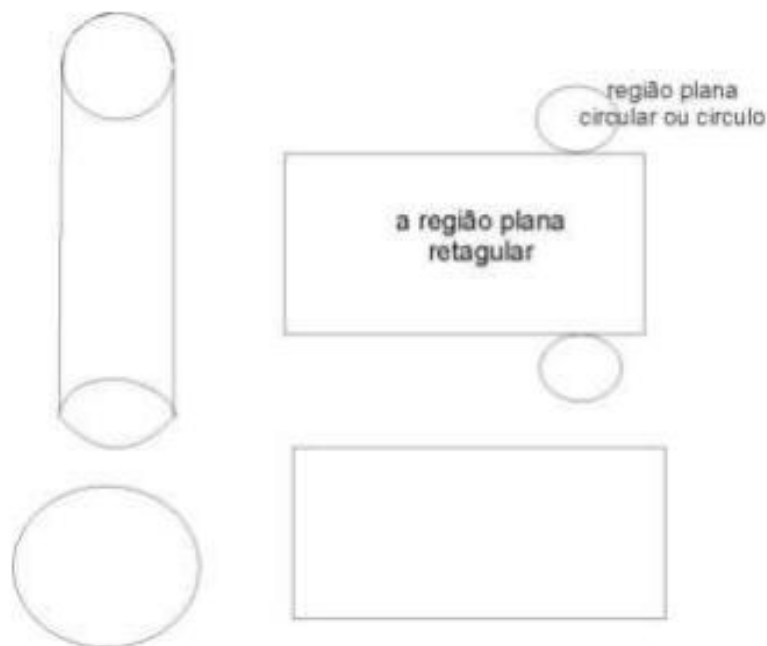
Figure 6 - Cylinder that forms the *Takua*



Source: prepared by the authors, 2024.

Thus, they are geometric solids that have at least one rounded non-flat surface and that therefore roll. The cylinder has two circular flat faces that are not flat ("it is rounded"), as shown in Figure 7.

Figure 7 - Representations of the flattenings of a cylinder

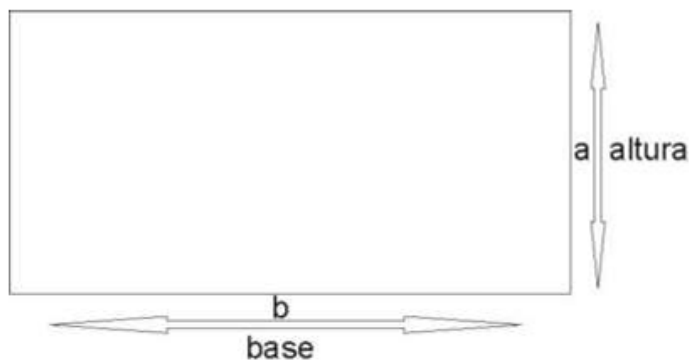


Source: prepared by the authors, 2024.

The Takua instrument having a cylindrical shape, with rectangular plane regions and circular plane regions, it can be used in a class on the length of the circumference in the eighth year of Elementary School (EF) and on the area of the rectangle in the sixth year of EF.

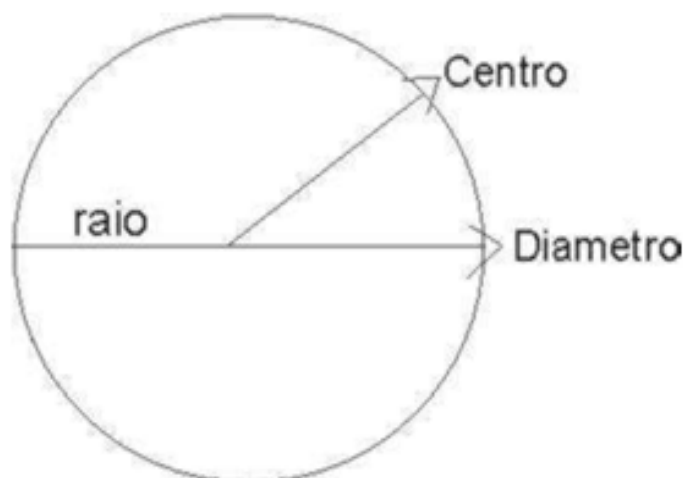
Thus, initially the teacher can explain the historical facts involving the *Takua* instrument, emphasizing in a second moment the mathematical concepts that are present in it: rectangular plane region, circular plane region, circle and circumference. Then, the teacher was able to demonstrate how to calculate the area of the rectangle (Figure 8), as well as the circle (Figure 9).

Figure 8 - Flattening formed by the rectangle



Source: prepared by the authors, 2024.

Figure 9 – Flattening the circumference



Source: prepared by the authors, 2024.

From the representations described previously, the teacher will be able to help students to calculate the area of the cylinder and the rectangle, students can also be asked to describe a final report on what they learned about the *Takua* instrument.

Final Thoughts

The article presented highlights the importance of rescuing and valuing indigenous culture, especially that of the *Kaiowá* in the Jaguapiré Village, located in Tacuru, Mato Grosso do Sul. In a context of cultural devaluation, initiatives like this become fundamental to strengthen traditions and promote meaningful intercultural education. The focus on the *Takua* instrument, used by women in indigenous songs and dances (*Jeroky*), reveals a deep and spiritual aspect of *Kaiowá* culture, highlighting the relevance of traditional knowledge in educational training.

This article presents qualitative research, conducted through participant observation and interviews with two female leaders of the village. This method allowed for a richer and more detailed understanding of the uses and meanings of *Takua*, evidencing its potential as an educational tool. The study developed a lesson plan that integrates *Kaiowá* cultural knowledge with the Teaching of Mathematics, demonstrating that it is possible to teach mathematical concepts through this spiritual artifact. This not only facilitates student learning, but also enriches the educational experience by connecting school content with local culture.

The Jaguapiré Village, inhabited by the Guarani *Kaiowá* and Guarani *Ñandeva* peoples, faces historical and contemporary challenges. Large-scale colonization and agroextractivism have resulted in the significant loss of their land and natural resources. The fight to recover their territories is marked by resistance and resilience, with the Guarani *Kaiowá* maintaining their ethnic-cultural characteristics, despite adversity. Indigenous school education, in this context, must prioritize respect and dialogue, valuing traditional knowledge and promoting an education that reflects the reality and needs of indigenous peoples.

The importance of indigenous teachers in schools is highlighted, as they have cultural mastery and fluency in the Guarani language, facilitating communication and understanding of students. The article also emphasizes the need to contextualize curricular content with indigenous cultural aspects, making teaching more meaningful and relevant for students. The use of *Takua* in Mathematics classes is an example of how traditional knowledge can be integrated into the school curriculum, promoting a more holistic and respectful learning of indigenous traditions.

Interviews with the elders of the community revealed details about the making and use of the *Takua*, highlighting the importance of the instrument in the *Kaiowá* culture. The elders reported how *Takua* is used in prayers and dances, emphasizing the need to keep these practices alive to preserve the cultural identity of the community. In this article, we demonstrate that, despite changes and external influences, traditional knowledge still has a vital role in the lives of the Guarani/*Kaiowá* and can be used to enrich indigenous school education.

In this work, we conclude that Ethnomathematics, by considering Mathematics as a cultural manifestation, can provide a more contextualized and meaningful learning, valuing the culture and experiences of students. The integration of traditional knowledge in Mathematics Teaching not only facilitates the understanding of mathematical concepts, but also strengthens the cultural identity of students, providing a sense of belonging and respect for their roots.

In short, the study highlights the relevance of initiatives that seek to integrate traditional knowledge in school education, contributing to the appreciation and preservation of indigenous culture. The use of *Takua* in Mathematics classes in the Jaguapiré Village is an inspiring example of how intercultural education can be enriched, promoting a more inclusive teaching that is respectful of cultural diversities. In this way, this approach contributes to a fairer just and equitable society, where all cultures are valued and respected.

References

- ABREU, R.R.N.; MAURO, V. F. Os Kaiowá e Guarani e a colonização de seus territórios nas páginas do jornal o progresso de Ponta Porã e Dourados. *Perspectivas em diálogo*, Naviraí, v.9, n.21, p. 356–368, 2022.
- BANIWA, G. *O índio brasileiro: o que você precisa saber sobre os povos indígenas no Brasil de hoje*. 2. ed. Brasília: MEC, Secretaria de Educação Continuada, Alfabetização e Diversidade, 2006.
- BENITES, T. *A escola na ótica dos Ava Kaiowá: Impactos e interpretações indígenas*. Rio de Janeiro, Dissertação de mestrado, Universidade Federal do Rio de Janeiro, 2009.
- BENITES, E.; SANT'ANA, G. R.; ANTONIO, L.; AGUILLAR, R.; COSTA, R. *A experiência do Projeto GATI em terras indígenas*. Brasília: IEB, 2016.
- BRASIL. *Constituição da República Federativa do Brasil de 1988*. Brasília, DF: Senado Federal, 1988. Disponível em: http://www.planalto.gov.br/ccivil_03/constituicao/constituicao.htm. Acesso em: 20 de agosto de 2024.
- BRASIL. *Decreto de 23 de novembro de 1992*. Homologa a demarcação administrativa da Área Indígena Jaguapiré, localizada no Estado de Mato Grosso do Sul.
- BRASIL. Ministério de Educação e Cultura. *LDB - Lei nº 9394/96*, de 20 de dezembro de 1996.
- CONSELHO INDIGENISTA MISSIONÁRIO REGIONAL DO MATO GROSSO DO SUL. *Conflitos de Direitos sobre as Terras Guarani Kaiowá no Estado do Mato Grosso do Sul*. São Paulo: Palas Athenas, 2001.
- D'AMBROSIO, Ubiratan. *Etnomatemática: elo entre as tradições e a modernidade*. Belo Horizonte: Autêntica editora, 1985.
- LOURENÇO, R.; PEREIRA, L.M. Escolarização e reivindicação de uma teoria do conhecimento guarani e kaiowá: interconexões entre o modo de ser indígena – ava reko – e o modo de ser não indígena – karai reko. *Rev. Antropol*, São Paulo, v.66, p.1-22, 2023.
- MINAYO, M. C.S. *O desafio do conhecimento: pesquisa qualitativa em saúde*. 12. ed. São Paulo: Hucitec, 2009.
- OLIVEIRA, M. A. M. *Nhande Reko Mbo'e: busca de diálogos entre diferentes sistemas de conhecimentos no contexto das práticas de professores de matemática Guarani e Kaiowá*. Tese (Doutorado em Educação) – Faculdade de Educação, Universidade de São Paulo, São Paulo, 2020.
- PIMENTEL, S.K. *Elementos para uma teoria política kaiowá e guarani*. São Paulo, Tese de doutorado, Universidade de São Paulo, 2012.
- QUIJANO, A. Colonialidade do poder, eurocentrismo e América Latina. Em livro: A colonialidade do saber: eurocentrismo e ciências sociais. In: *Perspectivas latino-americanas*. Edgardo Lander (org.). Colección Sur, CLACSO, Ciudad Autonoma de Buenos Aires, Argentina, 2005. p. 227–278.

REPETTO, M. O Conceito de Interculturalidade: trajetórias e conflitos desde América Latina. *TEXTOS E DEBATES*, v. 2, p. 69-87, 2019.

REPETTO, M.; DA SILVA, L. J. *Experiências inovadoras na formação de professores indígenas a partir do Método Indutivo Intercultural no Brasil*. TELLUS, v. 16, p. 39-60, 2016.

RIBEIRO, R. G. T. *A Etnomatemática presente em artesanatos e adereços produzidos por uma comunidade indígena Guarani do oeste do Paraná*, 174f. Tese (Doutorado em Educação para Ciências e a Matemática) — Universidade Estadual de Maringá, Maringá, 2022.

ROSA, M.; OREY, D. C. *Etnomodelagem: a arte de traduzir práticas matemáticas locais*. São Paulo: Livraria da Física, 2017.

SOUZA, L. S. O. *As Donas do Fogo: política e parentesco nos mundos guarani*. 2022. Tese (Doutorado em Antropologia Social) — Faculdade de Filosofia, Letras e Ciências Humanas, Universidade de São Paulo, São Paulo, 2022. DOI: <http://doi.org/10.11606/T.8.2022.tde-17022023-161454>.

TRIVIÑOS, A. N. S. *Introdução à pesquisa em ciências sociais: A pesquisa qualitativa em educação*. São Paulo, SP: Atlas, 1987.