

EARLY CHILDHOOD EDUCATION AND INDIGENOUS CHILDREN: A READING  
OF THE “MATHEMATICAL WORLD” POSSIBLE BASED ON PLAY

*EDUCAÇÃO INFANTIL E CRIANÇA INDÍGENA: UMA LEITURA DE “MUNDO  
MATEMÁTICO” POSSÍVEL A PARTIR DAS BRINCADEIRAS*

*EDUCACIÓN INFANTIL Y NIÑOS INDÍGENAS: UNA LECTURA DEL “MUNDO  
MATEMÁTICO” POSIBLE A TRAVÉS DEL JUEGO*



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**How to reference this paper:**

CIRÍACO, K. T.; SANTINO, F. S.; SILVA, D. A. Early Childhood Education and Indigenous Children: A reading of the “Mathematical World” possible based on play. **Revista Ibero-Americana de Estudos em Educação**, Araraquara, v. 18, n. 00, e023092, 2023. e-ISSN: 1982-5587. DOI: <https://doi.org/10.21723/riaee.v18i00.17256>



| Submitted: 05/10/2022  
| Revisions required: 02/03/2023  
| Approved: 15/05/2023  
| Published: 09/10/2023

**Editor:** Prof. Dr. José Luís Bizelli  
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**ABSTRACT:** The article aims to report the results of an extension project that promoted dialogues on Interculturality and Ethnomathematics through interactions with teachers of children aged 4 to 5 years and 11 months. The interventionist methodology considers collaborative work as an emerging point of indicator for action with indigenous peoples in Mato Grosso do Sul (MS) within the context of an ongoing training experience aimed at equipping pedagogical practices for working with mathematical language in the care of indigenous children. We conducted studies, reflections, planning, and validation of proposals that value indigenous play as a way of recreating childhood experiences in their interpretation of the world. Implementing actions to value indigenous knowledge in favor of an education that sees differences as a fundamental part of social inclusion represents the strengthening of ethnic identities in the Brazilian historical-political-social scenario and is an emerging topic for Early Childhood Education.

**KEYWORDS:** Early Childhood Education. Interculturality. Indigenous Child. Jokes. Ethnomathematics.

**RESUMO:** O artigo objetiva relatar resultados de um projeto extensionista que promoveu diálogos sobre Interculturalidade e Etnomatemática a partir de interações com professoras de crianças de 4 a 5 anos e 11 meses. A metodologia, de natureza interventiva, considera o trabalho colaborativo como ponto emergente de indicadores para atuação junto aos povos originários, em Mato Grosso do Sul (MS), no contexto de uma experiência de formação continuada na perspectiva de instrumentalizar a prática pedagógica para atuação com a linguagem matemática no atendimento à criança indígena. Realizamos estudos, reflexões, planejamentos e validação de propostas que valorizam a brincadeira indígena como forma de recriação das experiências infantis em sua leitura de mundo. Implementar ações voltadas à valorização dos saberes indígenas, em prol de uma formação que encara a diferença como peça fundamental da inclusão social, representa o fortalecimento das identidades étnicas no cenário histórico-político-social brasileiro e é tema emergente para a Educação Infantil.

**PALAVRAS-CHAVE:** Educação Infantil. Interculturalidade. Criança Indígena. Brincadeiras. Etnomatemática.

**RESUMEN:** El artículo tiene como objetivo relatar los resultados de un proyecto de extensión que promovió diálogos sobre Interculturalidad y Etnomatemática a partir de interacciones con docentes de niños de 4 a 5 años y 11 meses. La metodología, de carácter intervencionista, considera el trabajo colaborativo como punto emergente de indicadores para la acción con pueblos originarios, en Mato Grosso do Sul (MS), en el contexto de una experiencia de educación permanente en la perspectiva de instrumentalizar la práctica pedagógica para trabajar con el lenguaje matemático en la atención a los niños indígenas. Realizamos estudios, reflexiones, planificaciones y validaciones de propuestas que valoran el juego indígena como forma de recrear las vivencias de los niños en su lectura del mundo. Implementar acciones dirigidas a la valorización de los saberes indígenas, a favor de una formación que vea la diferencia como parte fundamental de la inclusión social, representa el fortalecimiento de las identidades étnicas en el escenario histórico-político-social brasileño y es un tema emergente para la Educación Infantil.

**PALABRAS CLAVE:** Educación Infantil. Interculturalidad. Niño Indígena. Juegos. Etnomatemáticas.

## Introduction

**Figure 1** - Images from the book '*O Menino Poti*' by Ana Maria Machado<sup>4</sup>



Source: Machado (1982)

The epigraphic images that open the article's introduction section draw appreciation from excerpts of "*Menino Poti*," a children's literature work by Ana Maria Machado. In the story, initially published by Salamandra in its first edition in 1982, the routine of an indigenous child living in the forest is narrated: "He lives in a hut, there in the village. Poti is beautiful, with toucan feathers on his chest" (MACHADO, 1982, p. 4-5, our translation).

According to official data from the National Foundation for Indians (FUNAI), based on evidence and records from the Brazilian Amazon, it is possible to assert the existence of approximately 100 indigenous groups living in isolation, thus preserving their traditional culture without any contact with society.

In this context, the representation of indigenous childhood in children's literature, as reflected in "*Menino Poti*," is significant in valuing the cultural roots of the ethnic group in question. However, singling it out solely based on the isolated routine in urban Early Childhood Education institutions where children from different indigenous backgrounds are enrolled can be a mistake as it reinforces stereotypes about the ways of life of indigenous peoples, leading to the false understanding that "all indigenous people are the same" (a common assertion).

As educators, we must be cautious about this because discussing children and indigenous childhood implies recognizing that this is a multi-ethnic terrain, and each has its particularities. In the work in question, the writer Ana Maria Machado highlights essential aspects throughout the short narrative, which deserve emphasis in a contextualized pedagogical approach that expresses a critical understanding of the children's world, grounded in the

<sup>4</sup> Text from the second image: The boy Poti goes by canoe through the forest. The canoe carries the pot. The pot holds many bananas. Text from the third image: Poti sees the armadillo and the agouti, sees the toucan and the rufous-collared sparrow.

perspective of Interculturality, which is our objective in the proposed discussion in the text, as we will see.

In this article, the objective is to report the results of an extension project carried out in the municipal network of *Naviraí* in *Mato Grosso do Sul* (MS), titled "*Infância, Interculturalidade e Etnomatemática na Educação Infantil: o atendimento à criança indígena* (Childhood, Interculturality, and Ethnomathematics in Early Childhood Education: Serving Indigenous Children)<sup>5</sup>". This project involved continuously training teachers responsible for children aged 4 to 5 years and 11 months. Within the scope of this formative experience, we examine the development and exploration of mathematical language based on collective reflections that resulted in possibilities for pedagogical intervention through the lens of play by promoting dialogue between Interculturality and Ethnomathematics. These concepts are considered central to the work aimed at including *Guarani-Kaiowá* indigenous children (the ethnic groups served by the teachers) in urban institutions.

To achieve this, we structured the text into four subsections, in addition to the introduction, which fulfills the following roles: 1) Presenting the critical concepts explored (Interculturality and Ethnomathematics); 2) Describing the methodological procedures; 3) Exploring the possibilities of indigenous children's games planned by the teachers; and, finally, 4) Final considerations.

### **Theoretical Framework**

In the adult-centric view, marked by the decisions of the "grown-up" person, we are conditioned to set boundaries for experiencing childhood. At times, we perceive it as a phase of life and define the times and spaces in which it can be present and exhibit its mischievousness. Contrary to this understanding, when we bring "childhood in Early Childhood Education" into the dialogue, Abramowicz, Levcovitz and Rodrigues (2009, p. 180, our translation) emphasize the need to defend childhood as an experience since it has a direct relationship with "[...] what we are capable of inventing as experimentation of other things and other worlds" rather than the temporal relationship that society imposes on the child.

In this context, it is worth noting that Early Childhood Education historically emerged as a compensatory policy for the working class due to the entry of women into the labor market.

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<sup>5</sup> It was funded by the Pro-Rectorate for Extension, Culture, and Sports (PROECE) in partnership with the Foundation for Support of Research, Teaching, and Culture (FAPEC).

This theoretically justifies one of its "histories," which reveals the medical-hygienist character at the end of the 19th century and the beginning of the 20th century, as well as the overemphasis on caregiving practices and the absence of children's experiences in its initial proposition. This is even more pronounced when we consider other cultures, such as indigenous cultures, for example.

When reflecting on the place of childhood experiences in Early Childhood Education, we can infer that since colonization, there has been little concern for indigenous peoples and their ways of experiencing childhood, a significant portion of the population that "survives" in contemporary Brazil. This situation worsened dramatically with the election of an extreme right-wing candidate as President of the Republic on January 1, 2019. Unfortunately, the problem, which was already concerning, became increasingly threatening with President Jair Bolsonaro<sup>6</sup>, in office from 2019 to 2022, as noted by Tourneau (2019, p. 8-9, our translation):

[...] measures against indigenous peoples have already been quite strong, which is not surprising, given that campaign statements or the transition phase with the previous government had provided clear indications that the issue would be a priority for Jair Bolsonaro and his ministers. Even as a candidate, the future president had vowed not to "yield one more inch to the Indians" [...]

In light of this, we understand that one of the reasons for including indigenous children in urban educational contexts arises from the migration of families to the city. This may be linked to the loss of land and "[...] incentives to maintain their space in rural areas; seeking resources for healthcare; studying in schools and universities; greater opportunities to sell their crafts; visibility of the situation of indigenous peoples in the country, among other factors [...]" (COMIN, 2008 apud VENERE; VELANGA, 2008, p. 181, our translation). This whole process of change with families results in the "[...] rupture of their children with traditional indigenous culture and their integration into a new culture, causing concern and generating distress due to the unpreparedness of urban schools to deal with differences" (VENERE; VELANGA, 2008, p. 176, our translation).

In the specific case of the state of Mato Grosso do Sul (MS), we need to consider the ethnic groups with which the teachers work directly (Guarani and Kaiowá) and the motivations for the presence of indigenous people in the city. "The search for a space to live in a way that guarantees rights, stemming from the struggle of the territorialization process, ends up contributing to the arrival of indigenous people in the city and, consequently, to their

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<sup>6</sup> Fortunately, to attain indigenous rights, he was the first President in Brazilian political history, post-military dictatorship, not to be reelected through democratic voting in the country.

urbanization" (CIRÍACO, 2018, p. 104, our translation). Among these rights, we highlight the right to education (Early Childhood Education), a space aimed at contributing to the holistic development of children up to 5 years old in physical, psychological, intellectual, and social aspects, in complement to the action of the family and the community (BRASIL, 1996).

Early Childhood Education, upon being recognized as the first stage of Basic Education, with the enactment of the National Education Guidelines and Bases Law No. 9.394 of December 20, 1996, becomes a space of opportunity for the expansion of development and learning for babies, very young children, and young children, while also constituting the right of all, provided they are under six years of age.

When we emphasize "all," we are referring to every child, regardless of gender, color, race, and ethnicity. This means that indigenous peoples should be included in the right to access and stay in indigenous childhood services, whether in the context of villages or urban areas where they live, given the migratory movement that intensified in the early 21st century. Previous works we conducted (CIRÍACO, 2018; SANTINO; CIRÍACO, 2021; CIRÍACO; SANTINO; SILVA, 2022) highlight that discussions "about" and "regarding" indigenous children are scarce when compared to research on being a child and experiencing childhood in educational institutions.

In this direction, it is necessary to establish spaces for discussion and, above all, for training in contexts that recognize and embrace other possible childhoods beyond the global and colonizing concept that we have encountered in the history of Brazilian Early Childhood Education.

Clarice Cohn (2005), in the book *"Antropologia da Criança (Anthropology of Childhood)"*, discusses the need to rethink the concepts of "child" and "childhood." The researcher highlights questions about how to experience this phase of life and how world representation involves adult-centric views regarding children's desires. Furthermore, in the case of indigenous children, the Eurocentric perspective also seems to predominate if we view the concept of "child" as homogeneous. That said, we ask: What does being a child mean? What is childhood?

Cohn (2005) also considers these to be difficult questions to answer. For the author, concluding the concept of "child" and "childhood" can be fraught with pitfalls because "[...] children are everywhere, we were all children at some point, and whether we desire to have children or not, they are a part of our lives" (COHN, 2005, p. 7, our translation). In the specialized literature on this subject, there is a wealth of knowledge production, which can lead

us to believe that we know everything and that there are no doubts about the challenging scenario of this phase of our lives.

In compliance with the provisions of Law 9.394/96, specifically Article 29, which established it as the first educational stage, there was concern about "what" and "how" to explore the areas of knowledge accumulated throughout human history with babies, very young children, and young children. In this context, in 1998, with the publication of the National Curricular Reference for Early Childhood Education – RCNEI (BRASIL, 1998a), in its three volumes – 1) Introduction; 2) Personal and Social Development; and 3) Knowledge of the World – a first attempt to establish forms of pedagogical work organization for the age group of 0 to 6 years old was laid out.

In our interpretation, RCNEI perceives childhood as a singular category. However, as we saw earlier in this section, childhood is a social construct, and depending on the historical period we are experiencing, we view children and childhood differently when we incorporate, unfortunately, deeply rooted values and beliefs of a culture that overvalues the world of adults and does not recognize this phase of life. In the same year as the RCNEI for Early Childhood Education, the National Curricular Reference for Indigenous Education (BRASIL, 1998b), was also published, a document that never mentions Indigenous Early Childhood Education.

The ideal scenario would be to incorporate the intercultural perspective into pedagogical practice and enhance the learning processes to ensure the right to education. This is because, according to Candau (2012), we must urgently address issues related to recognizing and valorizing cultural differences in educational contexts. This concept of "[...] interculturality means a radical transformation of society in all areas, starting from the participation of all social and cultural groups excluded by the modern-colonial process" (MELO; RIBEIRO; DOMINÍCIO, 2020, p. 2, our translation).

The institutional model of Early Childhood Education that we are familiar with has its origins in urban European societies, designed to serve their interests and the interests of communities that also follow this model, which involves an ideology/culture not centered on the needs of care/education (ROSEMBERG, 2005).

In the endeavor to connect children's experiences with the world of mathematical culture in early childhood, we find in Ethnomathematics, as a pedagogical practice perspective, a possible path to the inclusion of all in institutions, recognizing that mathematical knowledge is plural, and every culture is capable of producing mathematical knowledge and applying it to everyday life.

The Ethnomathematics program was initially defined by D'Ambrosio (2001, 2013). This term was first mentioned in 1976 at the 3rd International Congress on Mathematical Education in Germany. At that time, it became clear that Ethnomathematics seeks to study the local culture of people and their ways of survival. As a result, these people develop their mathematical knowledge, meaning that Ethnomathematics can contribute to/respect and value different cultural understandings and promote a world at peace (inner peace, social peace, environmental peace, etc.).

This interdisciplinary program, "Ethno-mathematics," seeks to understand and value each person's *ethno*, origin, and cultural context. *Matema* refers to aspects related to how one knows and explains a particular content. *Tics* concerns how people use arts/techniques to teach. Therefore, Ethnomathematics can be understood as the art of defining and understanding the different mathematics present in various cultural contexts (D'AMBROSIO, 2001, 2013), including indigenous, more specifically that of indigenous children.

In the case of Early Childhood Education, Monteiro (2018, p. 93, our translation) argues that to "[...] consider Ethnomathematics linked to Early Childhood Education, it is indispensable to make connections between non-school knowledge and school knowledge [...]" ; further emphasizing that "[...] considering a pedagogical proposal from an Ethnomathematics perspective in Early Childhood Education means recognizing everyday knowledge as something alive and encompassing real situations."

One possibility for this trend to take effect in Early Childhood Education can be found in interactions and play, which are the structural axes of the curriculum proposed by the National Curricular Guidelines for Early Childhood Education (BRASIL, 2010). Based on this, indigenous play and games can contribute to recognizing Mathematics in indigenous culture.

Recognizing the culture of indigenous peoples within non-indigenous spaces through play and games can be an alternative to valuing the representations formed through teaching practice. In this context, the role of the teacher is to enable new challenges: this teaching strategy adopts a practical aspect, giving those involved the freedom to experiment, reflect, and produce their knowledge (SARDINHA; GASPAR; MOLINA, 2011).

In this context, play stands out as a fundamental practice for a child's development and their relationships with others because when they play, they engage in something serious (SMOLE; DINIZ; CÂNDIDO, 2000). "Games and play allow children to experience seeking coherence and logic in their actions, governing themselves and others. They start thinking about



their actions in play, about what they say and feel...[...]" (DORNELLES, 2001, p. 105, our translation).

Play in Early Childhood Education provides, in this understanding, favorable moments of interaction between teachers and children in the process of cultural production. Thus, we understand that playfulness in educational institutions "[...] goes beyond fun and pleasure to a learning function, being a driver of knowledge and understanding of the world" (SANTOS; SANTOS, 2016, p. 3, our translation).

In light of this, Early Childhood Education teachers must be careful not to reinforce mistaken ideas and conceptions regarding indigenous culture since introducing children to Brazilian cultural diversity from a very young age is one of their responsibilities. This implies that the chosen methodology is crucial because, as teachers, we are responsible for organizing "[...] forms of interaction that will determine the appropriation, transfer, and construction of knowledge, expanding the areas of study, participation, learning, and creativity for children [...]" (FAUSTINO; MOTA, 2016, p. 403, our translation).

Ethnomathematics provides essential elements for the survival, in this case, for and with the indigenous cultures of the state of Mato Grosso do Sul (MS), specifically the indigenous children of the *Guarani-Kaiowá* ethnicity, so they can develop comprehensively, eliminating discriminatory inequalities and promoting intercultural relations inclusively in environments that constitute scenarios for human development and learning.

## Methodology

The intervention dynamics established for the training and collaboration processes with the target group of teachers in the extension activity focused on promoting actions in the municipal Early Childhood Education network of Naviraí (MS). These actions aimed to address the needs of indigenous children in educational institutions through curriculum practices that fostered a dialogue on Interculturality with Ethnomathematics. To achieve this, we formed a working group with preschool professionals with *Guarani-Kaiowá* children (the local ethnicity) regularly enrolled in their respective classes.

The proposal, at the time of its implementation, was linked to the Federal University of Mato Grosso do Sul (UFMS, Naviraí Campus) and took place from May to December 2018. The frequency of reflective sessions was bi-weekly (full-day Saturdays). We received financial support from the Pro-Rectorate for Extension, Culture, and Sports (PROECE) in partnership

with the Foundation for Support of Research, Teaching, and Culture (FAPEC) through Edict PROACE/FAPEC No. 8, dated March 2, 2018. This funding covered extension scholarships, daily allowances for guest lecturers, and consumable materials for the project "*Infância, Interculturalidade e Etnomatemática na Educação Infantil: o atendimento à criança indígena* (Childhood, Interculturality, and Ethnomathematics in Early Childhood Education: Serving Indigenous Children)," which was coordinated by the first author of this article, Prof. Dr. Klinger Teodoro Ciríaco.

For the group's constitution, a partnership was established with the city's Municipal Education and Culture Management (GEMED) to map the number of children served and who their teachers were, as they would be the target audience for the extension activity. With this data in hand, it was possible to contact the Integrated Early Childhood Education Centers (CIEIs) to invite them to participate in the project. The dynamics of the meetings occurred from a dialogical perspective with characteristics of collaborative work (FIORENTINI, 2004), rative work (FIORENTINI, 2004), allowing active participation of all those involved with an excess of vision (BAKHTIN, 1993). In addition to the teachers of indigenous children, students from the Social Sciences and Pedagogy programs also participated in the group. The profile of the participants significantly contributed to the enhancement of collective discussions that enabled dialogues between specific and pedagogical knowledge of each area of expertise.

In the established formative process, we intended to traverse the triad of reflection-action-reflection through problematizing the necessary training to promote essential children's rights. We grounded/fostered the studies in a theoretical framework based on the researchers who made up the universe of speakers.

Works such as Rodrigues (2010), Urquiza (2011), Nascimento and Vieira (2015), Souza and Bruno (2017) and Oliveira and Mendes (2018), for example, were direct subjects of discussion as lectures and workshops took place within the group's context.

Furthermore, beyond this cycle, we developed an initial and final questionnaire with the teachers so that at the beginning, we could gather performance indicators in the proposal's organization to understand the pedagogical ideology, difficulties, and motivations for inclusion in this space. Later, to assess the aspects highlighted as essential for continuous training in the field of indigenous issues, especially those related to childhood, and the understanding of mathematical exploration with an ethnomathematical perspective.

Gil (1999, p. 128, our translation) states that the questionnaire can be understood as "[...] a research technique consisting of a greater or lesser number of written questions presented to

individuals, with the aim of gaining knowledge about opinions, beliefs, feelings, interests, expectations, lived situations, etc."

In the present text, part of the interpretive reading of the difficulties, as declared in response to the questionnaire, is referred to in the description and analysis of data to help the reader understand the group's progress. We also explore the information provided by the last meeting, which took place in December 2018, where we conducted a "Practices Seminar," a space for dialogue with the participants, to see which proposals involving the concepts discussed in the project meetings could mobilize Interculturality and Ethnomathematics, leading us to indigenous games and activities as a rich and promising possibility for the urban Early Childhood Education context.

In the overall methodological process, we adopted multiculturalism (open and interactive) as a philosophy, which, according to Candau (2012, p. 243, our translation) "[...] emphasizes interculturality, considering it the most suitable for the construction of democratic societies that articulate policies of equality with policies of identity and recognition of different cultural groups."

### **The experience with the teachers and the possibilities of mathematically interpreting the world through indigenous games**

Regarding organization, what we carried out in 2018 aimed to promote collaboration and access to knowledge in a space-time of collective study with Early Childhood Education teachers. With the development of the questionnaire, before we started the meetings, the focus was on identifying conceptions about indigenous childcare and engaging in discussions aimed at understanding aspects of Interculturality and Ethnomathematics as perspectives of pedagogical practice in hybrid processes. With this instrument, it was possible to diagnose that:

[...] Early Childhood Education lacks mathematical activities; there is a lack of connection between what is proposed and the child's reality; the difficulty lies in learning, meaning that the child has limitations; and language, in general, is a difficulty in expression, preventing the teacher from addressing doubts and helping their students (SANTINO; CIRÍACO, 2021, p. 126, our translation).

When we inquired about the vision/conception of indigenous children regarding their behavior in proposed activities, it was possible to perceive that approximately 50% of the participants believed that the difficulty in teaching and learning mathematical concepts and oral and written language occurred because the children "[...] only speak Guarani, which highlights

language as a sociocultural barrier, according to the teachers" (SANTINO; CIRÍACO, 2021, p. 127, our translation).

Upon concluding the analysis of this questionnaire:

[...] We can infer that the teachers face difficulties in teaching indigenous children mathematical concepts due to various factors. Among these, the most notable are language, teacher-child and child-child interaction difficulty, and lack of time for such activities (...) We emphasize the need for more studies on the indigenous theme, considering the high demand for discussion on the topic, the significant number of indigenous children enrolled in urban educational institutions, and the almost nonexistent studies in this field (SANTINO; CIRÍACO, 2021, p. 130, our translation).

Considering the context in which we conducted the extension action, the questionnaire was a relevant instrument for identifying, based on the responses, what the declared conception was by the group of Early Childhood Education teachers regarding indigenous children. This served as a basis for organizing the formative dynamics and promoting collaborative work.

After identifying the reported difficulties, in an attempt to address the identified formative needs, we provided opportunities for dialogue with researchers in the fields of Anthropology, Indigenous Ethnology, Mathematics Education, Indigenous School Education, Ethnomathematics, and Interculturality, respecting the order of the sessions described in the methodology.

Based on the process experienced by the group, in the last meeting, we aimed to hold a "Practices Seminar," where participants who sought to implement tasks in their classes that incorporated concepts and were inspired by the discussions, we experienced could share their results with other participants, as well as evaluate positive aspects and what could be improved in future actions. This meeting took place on December 15, 2018 (Figure 2).

**Figure 2 – "Practices Seminar"**



Source: Photographic collection (2018)

As can be observed in Figure 2, this moment allowed us to expand the didactic-pedagogical repertoire and integrate the knowledge acquired in the training lectures and workshops into the teachers' lesson plans. On this particular day, some indigenous games and activities were presented as alternatives for Early Childhood Education, focusing on incorporating mathematical language aspects. Given the nature of the interactions and the negotiation of meanings within the group, this dialogue provided a reflection-action-reflection process.

Considering the limits and possibilities of the extension activity proposal, we introduced a game from indigenous culture that can be developed in Early Childhood Education. This is the game that the teachers selected for use in preschool and shared during the "Practices Seminar."

The game in question involves aspects similar to chess. This proposal is called "*Adugo*," also known as the "jaguar game" "It is a board game with pieces consisting of a jaguar and 14 dogs. The jaguar's objective is to capture 5 dogs, similar to checkers, while the dogs aim to immobilize the jaguar, similar to chess" (SARDINHA; GASPAR; MOLINA, 2011, p. 4, our translation). As observed in Figure 3, in indigenous communities, it is played differently, "[...] drawn on the ground, and stones are used as pieces. For this work, a board is used along with the fruit of the "*Pterodon emarginatus*" tree to represent the animals and seed from an unknown

species (Family: Sapindaceae) to represent the jaguar" (SARDINHA; GASPAR; MOLINA, 2011, p. 4, our translation).

**Figure 3 – Adugo Game**



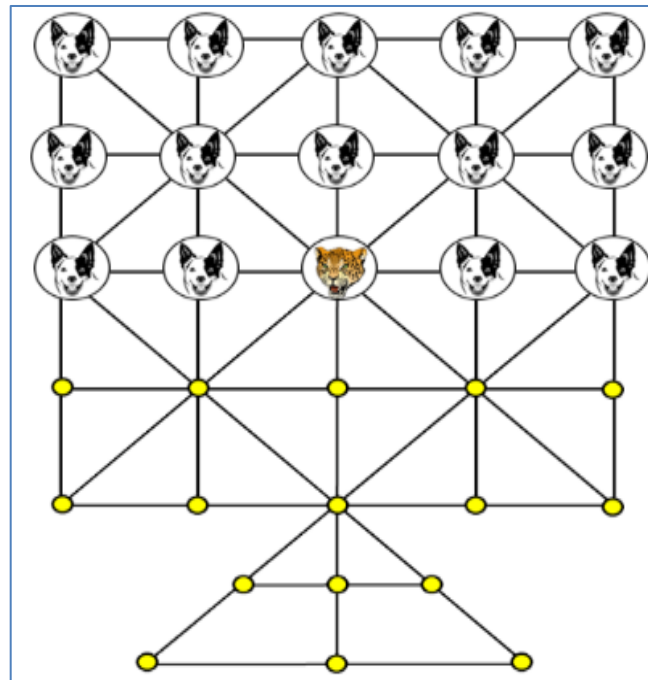
Source: Franco (2019)

Upon analyzing its configuration, it can be adapted to a practical, playful, and exploratory context for children aged 4 to 5 and 11 months. In a conversation circle, the teacher explains the rules; this moment is crucial because it enables language development, logical structures, and organization. Furthermore, through play, children interact with each other and create culture. For us, the presence of mathematics focuses on the relationship formed with the visual configuration of the board (with diagonal, horizontal, and vertical lines representing geometric shapes); in the correspondence between the pieces (which mark the number of animals and players), and also in the mastery of underlying concepts of the rules that allow for reflective abstractions with increasing difficulties in each move.

Next, with the rules discussed and/or redefined by the children, the board is constructed on the floor, and how to play is explained, relying on oral communication. When observing the lines that make up the visual scenario of the game and discussing how to play, we rely on mathematical language when verbalizing the possible representations that the lines form: triangle, column, square, line, etc. According to Smole (2000, p. 67, our translation), "[...] bringing mathematical language closer to the mother tongue allows the former to borrow the orality of the latter, and in this case, orality can mean an open channel of communication, understood here as the sharing of meanings." Furthermore, it is explained that this game/play belongs to indigenous peoples, and children in some communities play and enjoy it differently.

As the game progresses, the teacher can stimulate and explore concepts of direction and orientation; being a dynamic game also "[...] promotes the development of logical, deductive reasoning and the creation of strategies" (BETTIN; PRETTO, 2016, p. 4, our translation).

**Figure 4 – *Adugo* Board Diagram**



Source: Mesh (2018)

In the adaptation of the proposal, the teacher will decide who will be the "jaguar" and which children will represent the "dogs" (totaling 14). The "jaguar child" starts the game by moving to any neighboring empty square in any direction. Then, it's the turn of a "dog child" to move to a neighboring empty square, also in any order. The dog is captured when the jaguar jumps near it, embraces it, and takes it to an empty square in any direction. The jaguar can make more than one capture in a single move, similar to checkers. The jaguar cannot be captured but can be trapped in the den and immobilized without being able to move on the board. The game ends only when the dogs trap the onça in the den or when the jaguar captures six dogs (or a pre-established quantity). This play provides:

The construction of the notion of space, which occurs through the exploration of geometric space and its topological relationships, depends on various opportunities to access diversified experiences of movement and actions that allow the individual to interpret and understand objects in the physical world, classifying and organizing them according to their properties (PEREIRA; CALSA, 2009, p. 8, our translation).

*Adugo* provides indigenous and non-indigenous children with experiences for understanding the objects [and Mathematics] in the physical world around them, as they use terms from their culture and are close to and part of that local reality. For example, it is more didactic/significant to teach indigenous children, from a very young age, to play *Adugo* than chess.

[...] these experiences will be the starting point because teaching by itself does not enable learning and development, but when planned and systematized, it results in mental development that triggers various other developmental processes that would not occur otherwise (ANDRIOLI; OLIVEIRA, 2020, p. 634, our translation).

The game under consideration will require much movement from the child, which means it offers the teacher the opportunity to work on space and shape "[...] from the perspective of body schema, spatial perception, as well as the proper geometric notions" (ARAUJO, 2010, p. 165, our translation). From this perspective, work on the development of "[...] geometric thinking begins based on the objective and perceptual experiences triggered in the relationship with space, and this relationship permeates the child's development" (SILVA; PALMA, 2015, p. 20, our translation).

Given the nature of the actions involved in playing *Adugo*, it is essential to note that during the game's development, the teacher can also raise questions like: "How many children are representing the dog?" "How many jaguars do we have on our board?" "Let's count how many children are in the game." "Who is after the first one?" These questions are essential because "[...] creating moments in which counting explorations are present enables the student to build relationships between different forms of counting and understand the meaning of the words before, after, and between" (NACARATO; CUSTÓDIO, 2018, p. 168, our translation).

In summary, introducing indigenous games and play into Early Childhood Education within an intercultural approach linked to Mathematics Education, from the perspective of Ethnomathematics, can bring promising contributions to children's development, learning, and inclusion. This process values and respects socially subalternized cultures, deconstructing misconceptions about indigenous peoples. It is the least that can be done for and with people who survive and continue to fight for their right to education.



## Final considerations

The natural charm of children of all ages and social backgrounds for play led us to consider using games in mathematics classes. (...) While playing, the student expands their bodily capacity, awareness of others, perception of themselves as social beings, perception of the surrounding space, and how they can explore it (SMOLE; DINIZ; CÂNDIDO, 2000, p. 13, our translation).

The excerpt referenced is taken as a prelude to the final remarks precisely because, as highlighted by the authors, we find in children's play opportunities to experience the world through a mathematical lens in which, by interacting with others (whether adults or children), we are invited to abstraction, to reflect on how to act. When we correlate play with the indigenous context, given the tradition of some characteristic games and activities of different ethnic cultures, we are producing and valuing non-hegemonic knowledge, giving space to the meaning attributed by children in their coexisting "childhoods" in the same class.

Throughout this article, we have problematized indigenous childhood's place (or non-place) in Early Childhood Education. This place needs to be treated differently regarding the social inclusion of children in their primary socialization, which could find a possible path in play. In addition to this aspect, it was also our intention to correlate the role that play seems to play in the mathematical worldviews in the experiences planned and promoted by teachers in their classes, or rather, what is yet to come after a period of continuing education regarding indigenous themes, with a focus on childhood.

After the extension project in which we were members of the executing team, we can conclude that some limits were not obstacles to the development of the proposal; on the contrary, these represent future indicators of performance, as was the case with the analysis of the possibilities of indigenous children's play in correlation with mathematical knowledge.

In summary, teachers still need to deepen their theoretical and methodological reflections on the topic of ethnic-racial relations, more precisely in this case regarding intercultural and ethnomathematical practices (the focus of the work we envisioned with the extension). However, despite the limitations, the search for methodological pathways for problematizing mathematical language in indigenous childhood mobilized the group to present proposals that involved play, such as *Adugo*, a game proposed by the teachers themselves in a movement of autonomy and criticality necessary for an Early Childhood Education that seeks to be intercultural.

**ACKNOWLEDGMENTS:** We would like to express our gratitude to the Office of Extension, Culture, and Sports (PROECE), in partnership with the Foundation for Support of Research, Teaching, and Culture (FAPEC), for their support and funding of the action that enabled the experience described and analyzed here.

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### ***CRediT Author Statement***

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**Acknowledgements:** We would like to acknowledge the Municipal Department of Education and Culture of Naviraí – GEMED – for their partnership with the University.

**Funding:** This work was supported by the Office of Extension, Culture, and Sports (PROECE) in collaboration with the Foundation for Support of Research, Teaching, and Culture (FAPEC).

**Conflicts of interest:** There are no conflicts of interest.

**Ethical approval:** Not applicable.

**Data and material availability:** Not applicable.

**Authors' contributions:** All authors contributed equally to the production of this article.

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**Processing and editing: Editora Ibero-Americana de Educação.**  
Proofreading, formatting, normalization and translation.

