

KUBAI, THE ENCHANTED AND THE TANGIBLE TABLE

KUBAI, O ENCANTADO E A MESA TANGÍVEL

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ABSTRACT: The path of indigenous stories has been trodden since the creation of the world, and it is brought to children by the elderly. The tradition of narrating the origins of each people is deeply related to each clan and ethnicity, although in different ways. This paper is part of a research that aimed at the development of Assistive Technology, in the inclusive educational context, to tell the story of Kubai, the Enchanted, through the a Table-based Tangible Interaction. The qualitative methodology involved the production of tactile and three-dimensional images in order to ensure tactile accessibility, presenting in inclusive story. The research also included a study on indigenous children's literature based on contemporary authors, such as Munduruku, among others. As a result, it was possible to create a support in a tangible table device from the chosen story inspired by the indigenous mythology of the Kubeo culture.

KEYWORDS: Indigenous children's literature. Kubeo culture. Tangible table. School inclusion. Assistive technology.

RESUMO: O caminho das histórias indígenas é trilhado desde a criação do mundo, chegando às crianças pelos mais velhos. A tradição de narrar a origem de cada povo relaciona-se profundamente a cada clã e etnia, ainda que de formas diferentes. O presente artigo é parte de uma pesquisa que objetivou o desenvolvimento de Tecnologia Assistiva, no contexto educacional inclusivo, para contar a história *Kubai, o Encantado* por meio da Mesa com Interação Tangível. A metodologia, de caráter qualitativo, envolveu a produção de imagens táteis e tridimensionais com o intuito de garantir a acessibilidade tátil, apresentando a história de maneira inclusiva. A pesquisa abarcou, igualmente, estudo referente à literatura infantil indígena com base em autores contemporâneos como Munduruku, entre outros. Como resultado, foi possível criar suporte em dispositivo de mesa tangível a partir da história escolhida, inspirada na mitologia indígena da cultura Kubeo.

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PALAVRAS-CHAVE: Literatura infantil indígena. Cultura kubo. Mesa tangível. Inclusão escolar. Tecnologia assistiva.

RESUMEN: *El camino de las historias indígenas ha sido recorrido desde la creación del mundo, llegando a los niños a través de los ancianos. La tradición de narrar el origen de cada pueblo está profundamente relacionada con cada clan y grupo étnico, aunque de formas diferentes. Este artículo forma parte de una investigación que tuvo como objetivo desarrollar una Tecnología de Asistencia en el contexto educativo inclusivo, para contar el cuento Kubai, el Encantado a través de una Mesa con Interacción Tangible. La metodología, de carácter cualitativo, involucró la producción de imágenes táctiles y tridimensionales con el propósito de garantizar la accesibilidad táctil, presentando la historia de manera incluyente. La investigación comprende un estudio sobre la literatura infantil indígena fundamentada en autores contemporáneos como Munduruku, entre otros. Como resultado, a partir de la historia elegida fue posible crear un dispositivo de mesa tangible, inspirado en la mitología indígena de la cultura Kubeo.*

PALABRAS CLAVE: *Literatura infantil indígena. Cultura kubo. Mesa tangible. Inclusión escolar. Tecnología asistencial.*

Introduction

One day, I was telling stories to a group of young children. I was narrating one I heard from my grandfather. It was a moving story. In the end, a girl lifted her finger and asked me, "Indian uncle, where can I find these stories for me to read?" I was awkward because I didn't know what to answer. But this was as if a switch was turned on in my head: I had to spread those stories (MUNDURUKU, 2016, p. 2)

Munduruku presents the indigenous as "great storytellers, and to get to know indigenous peoples more, nothing better than knowing some of their stories" (MUNDURUKU, 2019, p. 33). Daniel Munduruku's⁴ trajectory is permeated both by experience in indigenous spaces and by training with teachers, and it was in the classroom that he also used the practice of storytelling. In the *Stories I've Read and Like to Tell* (MUNDURUKU, 2011), there are many indications of this living and telling about indigenous cultures in Brazil. Orality is essentially "a repository for the uniqueness of identities, cultural history, traditions and memory, as advocated in Article 216 of the 1988 Constitution" (PACHAMAMA, 2020, p. 28), however, it is the written text that allows expanded access to stories exponentially.

⁴ Daniel Munduruku is one of the most important authors when it comes to indigenous literature, having today more than 50 books published, mostly aimed at children.

There are approximately forty authors and authors who release books with some regularity. There are hundreds of "anonymous indigenous writers" who maintain blogs, websites, social media profiles. There are indigenous entities concerned with using writing as a weapon capable of reversing conflict situations, denouncing internal and external abuses, showing that literature – is understood as being better – is truly a new instrument used by culture to update ancestral memory (MUNDURUKU, 2014, p. 181).

For this research, it was initially necessary to know and analyze books published by Munduruku and by so many other indigenous people who offer us rich stories produced from their cultures. Brazilian contemporary indigenous children's literature has been socializing in printed books in order to maintain and preserve the culture of people of different ethnicities. According to Souza (2018), or as he is known in indigenous activism, Ely Macuxi, "the productions of indigenous literature from the 1980s and 1990s were primarily directed to ethnic groups themselves, for their formation in villages" (SOUZA, 2018, p. 52).

This literature has been effectively reaching schools based on Law No. 11,645, 2008 (BRASIL, 2008), which made the teaching of "Afro-Brazilian and Indigenous History and Culture" mandatory. We emphasize that the school curriculum began to contemplate much of the literature of indigenous authors, such as Daniel Munduruku, among others.

In a second moment of the research, we dedicated ourselves to the development and adaptation of an indigenous history chosen from the culture of the Kubeo people, to which belongs to the first author of this text. As we did several searches, we reached the documentary *El Retorno del Cubai* (2012), by indigenous director Luz Adriana Quigua, of the Kubeo ethnic group, from Colombia. The film is a metaphor of returning to the roots of the filmmaker and presents the path taken by the anaconda in the creation of the world, climbing the river of the universe, demonstrating how some customs and experiences that make up the indigenous culture of this people were unleashed.

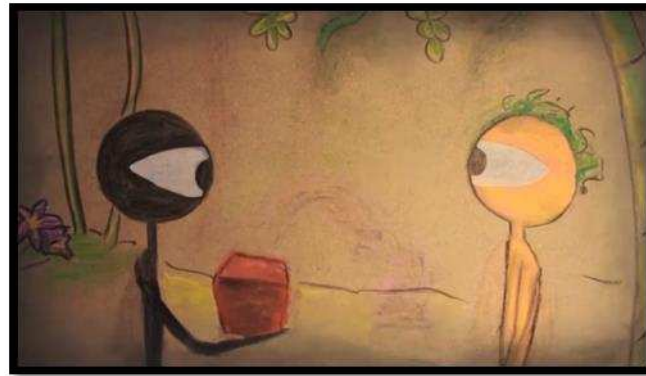
The history was adapted by the OMITIDO/UFRGS Group ⁵, enabling intercultural approaches between indigenous and non-indigenous. According to Luciano (2011), "indigenous mythologies reveal that the different forces, energies and spirits that govern the world are constitutive parts of the same nature that need to act with balance, harmony, reciprocity and complementarity" (LUCIANO, 2011, p. 14).

We present below an image of the documentary "El Retorno del Cubai", which was the trigger of the research, a strong element in the idealization of the illustrations, as well as for the

⁵ The story "Kubai, the Enchanted" belongs to the culture of the people Kubai and it's in the public domain. It was rewritten and adapted by members of the omitted group/OMITTED NUCLEUS/UFRGS in multiformat. To access the story telling in Portuguese, Guarani, Tukano and in Brazilian sign language - Libras. Available at: <https://www.ufrgs.br/OMITIDO/contacao-da-historia>. Access on: 22 Sep. 2021.

tactile and three-dimensional images selected and produced in order to be used on the tangible table.

Figure 1 – Kubai and the creation of the world⁶



Source: El Retorno del Cubai (2012)

As can be seen, Kubai is a being with humanoide characteristics, possessing only one eye. Arriving on Earth, he participates in the creation of important elements of nature, such as rivers, establishing his interaction with the people of the Kubeo people, and presents them with some cultural elements such as the type of housing, the way of dressing, celebrating, eating, drinking and dancing. Kubai is a being of divine characteristics, among others enchanted beings that are part of the everyday life of the indigenous people. The experiences in the longhouse and in the forest are a strong point of the transmission of customs.

Kubai, The Enchanted: stories and culture

Once again Kubai, an enchanted, adventurous and curious being, who created things using the magic of words. Once, in a distant and dark place, he said, "May beautiful colored leaves make themselves feel." Creating, then, a beautiful forest. In the midst of those huge trees, he had another idea: "in this forest they can have animals." And suddenly, the first one came up: it was big and soft-haired, it was a cheerful, observant jaguar. Kubai realized, from the top of the trees, that there were still sounds missing there, and playing with words, he created songbirds. The most colorful bird soon handed him a beautiful headdress, thanking him for the freedom to fly. Kubai looked down, and feeling the earthy ground beneath his feet, realized that there was a lake being made: it was the anaconda that crawled inventing a trail. Then Kubai the Enchanted followed the path and reached the refreshing waters of the Negro River, where he dived to the bottom and continued to create and play. I wonder what he's going to make up now.⁷

According to the ethnography of the Kubeo people, from the point of view of

⁶ Image description: character illustration Kubai in black color and an indigenous in yellow color, which are standing one in front of each other. Both have only a large eye in the middle of the face. Kubai holds in the hands a brown box in delivery position for the other being.

⁷ Full text of the story Kubai, the Encantador.

cosmology, kubai is part of the category of “mythical heroes whose acts or with whose help the order of the cosmos was established.” (CORREA, 1997, p. 23). Thus, the forms of organization and histories of groups like this show how indigenous societies are driven by the magic of myths, that is, by ancestry.

From an early age, indigenous children have heard the stories told by their elderlies. The tradition of narrating the origin of each people is deeply related to each clan and ethnicity, even in different ways. The tales of the creation of the world, for example, can be told in different versions and, at the same time, present elements in common, evoking the exchanges of experience of each people.

This article is part of a larger research, which gives visibility to an indigenous history inspired by a mythological being of the Kubeo people. The history of Kubai, divinity of indigenous cosmology, is part of those referred to as "Enchanted", who are protective beings and transmitters of ancestral knowledge, rituals and festivals. Cultural knowledge has been transmitted by the figure of the enchanted Kubai, such as the garments and the arts in headdress feathers. Important aspects, according to Wriyth (2017), are also expressed in paintings and graphics, in drink as caxiri, in dances, in the playing of flutes and drums.⁸

The first ancestors were included in all parts of Kubai's body. The Baniwa, from the Aiari and Içana rivers, stated that the meanings of Kubai's traditions are related to cultural continuity, the transmission of culture and knowledge, from patrilinear and older ancestors, to their living descendants, especially the newly initiated ones (WRIGTH, 2017, p. 333).

Kubai's history has been transmitted orally since the beginning of the world, according to the tradition of the Kubeo people, a particularity that gave rise to the transmission of the wisdom of the ancients and culture as it is known today and, under the responsibility, mainly, of the shamans, reaches the contemporary generation.

Taking great care to ensure the cultural preservation of the Kubeo people, we seek to use the technological resource of the Tangible Table as a way to socialize and interact with this millenary history of the Kubeo indigenous ethnic group, retold and adapted by us and other members of the OMITIDO-UFRGS group.

⁸ The first author of this article belongs to the People Kubeo. Part of the population Kubeo colombian territory, in the Alto Uaupés region and its tributaries Querari, Cuduiari and Pirabatón. In Brazil, they occupy three villages in Alto Uaupés and are in small numbers in the High Aiari. They have around 30 sibs (clans).

Tangible Interaction

Technologies, according to what we know, have been used for some time as pedagogical tools in which computers, mobile phones and *tablets* are commonly used resources. We recognize the potentialities of these devices, which, in recent times, are more dynamic and practical, allowing the interaction of individuals with technologies, for example, through touch and clicks on screens. Tangible Interaction (TI) is being considered here as a type of innovative technology, motivated by the perspective of mediation, promoting the interaction of contact with the other and with real objects. It is a combination of computer systems, objects and audiovisual resources, which become powerful from interaction with users. The very word "tangible" refers exactly to this possibility of touching, picking, feeling when working with a tangible interaction. The use of the tangible table can enable, together with the action of feeling by touch, also interact, exchange, move, among other aspects that we will resume throughout this writing.

By associating tangible interaction with software and computational devices, tangible interfaces were created, which, according to Falcão and Gomes (2007), allow the use of computing for the benefit of education beyond the use of personal computers. The authors indicate that "the idea is to embed computational elements in concrete materials, creating a new group of didactic resource that unites the advantages of physical manipulation with interaction and multimedia provided by technology" (2007, p. 579). Such resources can favor and intensify the use of meanings such as hearing, vision and touch and, thus, provide accessibility also for people referred to as public special education, which is one of the objectives of the tangible table, or rather, to be an Assistive Technology (AT). Removing barriers, expanding possibilities and providing access to materials, content and stories is not only fundamental, but is a presupposition of an inclusive school environment.⁹

As we have already pointed out, this is a combination, unlike commonly used features, because instead of just touching or clicking on a screen or keyboard, it is necessary to pick up, move, place and/or remove one or more objects for the planned interaction in a computational interface to occur on a device named Tangible Table (TT). Three-dimensional objects can continue to be presented during the use of the table as a way to ensure a clue to the child when he/she is trying to relate the image on the table to the physical object.

⁹ AT is recognized as an area of interdisciplinary knowledge, which includes products, resources, methodologies, strategies, practices and services that aim to provide accessibility and inclusion in different spaces.

A Tangible Table (TT) offers the possibility of being a tangible interaction resource linked to computational interfaces, and can be thought of as a box-shaped mobile, as seen in this research. Its top surface must be horizontal, ensuring sufficient space to hold objects of various sizes, which the child can hold and interact with them, changing them. The upper surface should also ensure semi-transparency in order to display or project images or animations that drive interactions.

A tangible table is an IT that allows interactions on its surface with real physical objects, identified at its base with fiducial markers for recognition of interactions and can be used in cognitive tasks involving visual, sound, tactile and symbolic representations of objects (GLUZ *et al.*, 2018, p. 547).

The Tangible Table (TT) has tools that allow adapting games and stories, which can be used in mediation as a pedagogical resource, collaborating in the learning process so that an individual can manipulate real objects interactively. Some technical elements should be observed for their structure: the functional and technical part of TT (Fig. 2) have specific measurements of the external face.

Figure 2 – Tangible table: front view¹⁰

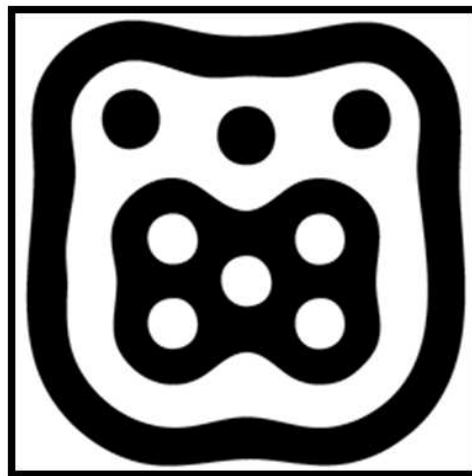


Source: Collection of the authors

¹⁰ Image description: photograph of a tangible table in front, which allows you to see a wooden furniture shaped box of equal sizes, of white color.

According to Passerino (2018), the student will use objects with marking codes underneath called fiducials, reading codes that resemble bar codes (HOFMAM *et al.*, 2006), being illuminated by infrared LEDs and captured by an internal camera. Thus, the objects, at their base, have this fiducial (Fig. 4), and each one receives a numbering, with a specific area projected on the table that, when contacting the surface, is activated, performing an audiovisual media of the story narration, requesting a new command or feedback. Objects have the function of allowing the knowledge of images through touch and manipulation of tactile images, in the same way that enables children to experience three-dimensionality, ensuring the visibility of images for all of them.

Figure 3 – Fiducial¹¹



Source: Collection of the authors

Applications made on the Tangible Table may recall an activity triggered on tablet or mobile phone, given the use of visual language and virtual interaction from software or educational applications. The difference, however, between the table and the other devices, lies in the use of real objects during interaction, when using the touch screen, through sliding with your fingers. The actions performed at the Tangible Table involve broad gestures, using selected objects, which can be from the child's daily life. In the case of this research, three-dimensional elements were widely worked on in advance, ensuring familiarity with the elements of the story. It is also important to clarify that the moment a child plays, he/she hears a story with another child. In this way, the two will be performing an interaction movement with each other and also with the activity involving such technology.

¹¹ Image description: An illustration of a digital code called fiducial inserted into a square of thin lines in black color. It features white area with black circles and another five white circles leaked as a sieve.

In the editor, the activities are formed by a set of scenes. In each scene is chosen the background image, the audio of narration or explanation and the other images that make up the scenario, with the possibility of animations of these images [...]. When there is interaction with tangible objects, in the editor the areas of this interaction and the configuration of the correct and incorrect fiducial elements and the respective sound or pictographic feedback for each response are delimited (PREUSS *et al.*, 2019, p. 3).

Inside the table there is a mirror (Fig. 5) and a LED light, which illuminates its surface, and the operation of the mirror reflection with the projector provides the use of the images of scenarios of a story or a game.

Figure 4 – Tangible table interior: view from the top and table without cover¹²



Source: Collection of the authors

According to Passerino, Roselló e Baldassarri (2018, p. 366), "The arrangement of the users around the table reinforces interaction and eye contact, and in addition, the animations and digital sound are an important stimulus to facilitate attention and motivation" (our translation). Tangible Technology, promoted by the use of tangible interactive interfaces, according to Passerino and Baldassari (2017), qualifies communication with the stories that are being worked when one has the aid of visual narratives.

What makes a technology social is not its conception, but its ability to transform social processes. In a creator-creature relationship, it is the creature that escapes and transforms into the engine of transformation of processes far beyond the original conception (PASSERINO; BALDASSARI, 2017, p. 366, our translation).

¹² Image Description: Shows the inside of the tangible table, a movable, large box type. At the bottom of it there is an overhead projector, wires connectors, webcam and a mirror. LED lamps are installed on its eaves.

As we have seen, from TT, it is possible to perform interactions with real objects, designed for the activity to be developed. This direction takes special care in our research and we will indicate, below, the procedures used. We emphasize that, to present pedagogical activities at the Tangible Table, we initially selected the characters of the story carved in wood, developed by the Guarany people and, in addition to them, we developed the characters also in felt. It is important to emphasize the need for these three-dimensional characters for use on the tangible table, as the fiducials are at their base.

The intention of using Tangible Interaction (TI) for history was to provide other forms of languages, allowing and qualifying mediation in the presentation of stories to children, to all of them. In the field of technologies, TI can present interesting results regarding peer interaction, in the execution of activities, providing the subject with immediate feedback.

After developing the story and the characters, we began to idealize the proposition of activities, the telling and reflection on the story through the Tangible Table. In the context of the development of technological devices, the use of Tangible Technology (TT) with the use of three-dimensional objects is recent, as Bonillo, Marco, Cerezo and Baldassarri (2015) refer. From this perspective, we look for objects and characters developed for the story and, here, with three-dimensional shapes, as already mentioned, in order to improve access to the surface of the Tangible Table.

From the story Kubai, the Enchanted initially developed, we used the Tangible Table (TT) as a device to approach children. For the use of TT, we start with the presentation of the characters in wood, as already mentioned. After the recognition of the characters of the story in a three-dimensional way, we began to operate with the events of the story through actions at the Tangible Table. For this moment of work, we developed the character Kubeo in felt, in a three-dimensional way, in order to allow him to stand on the table, as well as to allow to easily attach it to his base, the fiducial, making the connection with the Tangible Table. For the development of history at the table, we seek the dialogue and access between the images on the screen through the mediation made possible by speech and tactile images in order to provide alternative forms of communication and access to the integrity of the story and to allow interlocutions in the use of the table.

Theoretical and Methodological Procedures

There are a variety of table types and tangible interactions, however, they are high-cost technologies that require complex interfaces and programs. The Tangible Table in the scope of UFRGS was developed by Professor Liliana Maria Passerino, with the purpose of becoming a technology possible to be produced, combining low-cost resources and also offering its own resources to expand research and identify the potentialities about TT, while Assistive Technology for people with disabilities. Research has been carried out by several students/researchers who were their mentees, as the first author of this article.¹³

The general objective of the research presented here was to develop Assistive Technology in the inclusive educational context to tell the story Kubai, the Enchanted, through the Table with Tangible Interaction. As a secondary objective, it sought to develop a history of the Kubeo people in an inclusive way, using tactile and three-dimensional images, ensuring tactile accessibility.

Bringing the indigenous culture of the Kubeo people to the format of the Tangible Table, through cosmologies and mythologies, became significant to the group involved in the study and made it possible to form the scenes for history and the tangible interface, as it allowed approximations with indigenous culture from the perspective of diversity. For the making of three-dimensional dolls we use as reference the cosmology itself and the spirituality of the Kubeo People. The interculturality triggered by the work was woven from the first author who, as already mentioned, is descended from the Kubeo people. In addition, the readings allowed the research group to approach amerindian cultures and the development of illustrated, tactile and three-dimensional images.

Initially, we organized a box with wood animals produced by the guarani indigenous women of Tekóa Jataí'ty, known as Cantagalo village (Viamão-RS). By awakening the children's sensitivity to the touch and textures of the wooden animals, we proposed to experience the knowledge of the cosmologies of the Guarani Ethnicgroup, an original people present in Rio Grande do Sul, as well as the attentive eyes of our Guarani children (GEORGE, 2011).¹⁴

¹³ The Tangible Table (TT) is the result of research initiated at the University of Zaragoza in Spain, and the use of this technology has its references based on Ullmer, Ishii and Jacob. Passerino, at UFRGS, developed research in interaction with the University of Zaragoza.

¹⁴ "Wood carvings representing animals present in the daily life of the Guarani. It's a male activity. Man removes wood in the woods (crate, whose scientific name is *Tabebuia cassinoides*), cuts with the knife and carves. Then the sculpture (jaguar, anteater...) is burned with hot iron" (GEORGE, 2011, p. 56).

We recall here the teachings of older people when they allude that each pet has a secret, has a history, and that secret and this story have to be respected. "For you, the animal is just an animal and nothing more, for Guarani has a secret, said Mr. Dario" (BERGAMASCHI, 2005, p 138).

Figure 5 – Guarani Mbya wood animals¹⁵



Source: Collection of the authors

The experience of handling three-dimensional animals makes it possible to differentiate them to later recognize them also in other contexts, such as in the application of questions in the use of the Tangible Table, as well as about the animals of Kubai's history in illustrated tactile images.

For the application in the Tangible Table, a fiducial was produced inserted in the base of the kubai character, made of felt, ensuring three-dimensionality, stability and easy handling on the tangible table. In this application, three scenes appear and, in each one, situations taken from the story of Kubai, the Enchanted, will be problematized.

When the child takes the character to one of the images on the screen, with an answer corresponding to the question, receives a positive voice feedback and can proceed to the next question or scene in the story.

¹⁵ Image description: horizontal photography. On a white surface are 8 animals carved in wood, from left to right of the image: a jaguar, an otter, a coati, an alligator, a turtle, an owl, a hawk, a toucan, arranged side by side

History Applied to the Tangible Table

The illustrations for the story developed from the documentary already mentioned and research on indigenous graphics, according to the characters of the story. The sequence, for use with the Tangible Table, was based on the idea of questions and answers about Kubai's story.¹⁶

Figure 6 – Kubai Doll¹⁷



Source: Collection of the authors

1. Help Kubai find the forest

Once upon a time there was Kubai, an enchanted, adventurous and curious being, who created things using the magic of words.

Once, in a distant and dark place, he said, "May beautiful colored leaves make themselves feel." Then creating a beautiful forest.

¹⁶ The images were produced by the scientific initiation fellows of OMITTED: OMITTED NAME and OMITTED NAME, both of the product design course at UFRGS. The felt characters were developed by Dr^a. OMITTED NAME, too, component of omitted.

¹⁷ Image description: vertical photography. Background in light tones, in the center a felt doll of dark brown color, is 28 cm high and a round base of 10 cm in diameter. It has a large round head that occupies two-thirds of its size, with only a large white eye covering much of the face. It has cone-shaped body and arms with extension of the curved hand. Two flat feet.

Figure 7 – City¹⁸



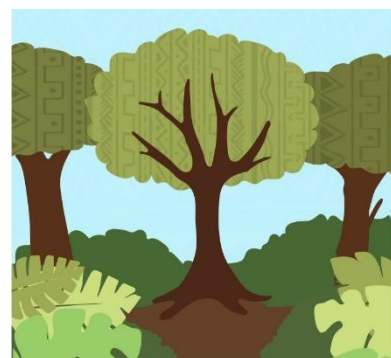
Source: Collection of the authors

Figure 8 – Desert¹⁹



Source: Collection of the authors

Figure 9 – Floresta²⁰



Source: Ufrgs omitted group

¹⁸ Image description: square with black line borders and a white inner outline. In the center, a blue background and the design of three buildings in different sizes and colors.

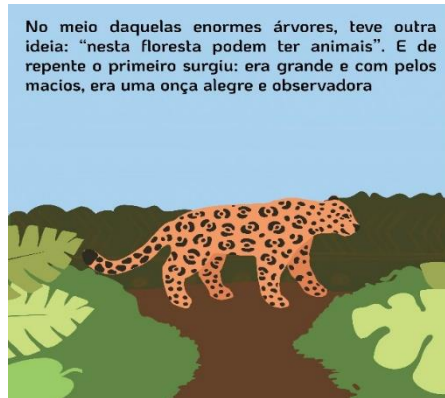
¹⁹ Image description: square with black line borders and a white inner outline. In the center, a bluish background representing a sky, a sun is present in that sky and there is at the bottom of the image a desert-like ground.

²⁰ Image description: square with black line borders and a white inner outline. In the center, a bluish background. The green floor with some leaves in green tones and three trees, with dark brown trunks and green leaves.

2. Help Kubai find the jaguar

In the midst of those huge trees, he had another idea: "In this forest you can have animals." And suddenly the first came up: it was big and soft-haired, it was a cheerful, observant jaguar.

Figure 10 – Jaguar²¹



Source: Collection of the authors

Figure 11 – Monkey²²

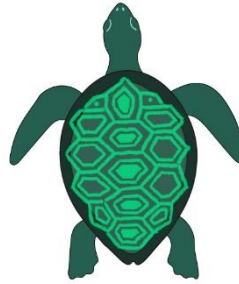


Source: Collection of the authors

²¹ Image description: square with black line borders and a white inner outline. In the center of the image, blue background, brown floor with leaves and green lawn on its sides and center, a painted jaguar facing the right side.

²² Image description: square with black line borders and a white inner outline. To the center of the image, blue background with some white graphics. The ground is a lawn and on it, a centralized brown monkey looking at the reader.

Figure 12 – Turtle²³



Source: Collection of the authors

3. Help Kubai find the headdress

Kubai noticed from the top of the trees that there was still no sound there and, playing with words, created songbirds.

The most colorful bird soon handed him a beautiful headdress, thanking him for the freedom to fly.

Figure 13 – Headdress²⁴



Source: Collection of the authors

²³ Image description: square with black inline edges and completely white background. In the center, a green turtle.

²⁴ Image description: square with black line borders and a white inner outline. In the center, a bluish background, in light tone, and the image of a headdress with red, yellow and blue feathers.

Figure 14 – Indigenous Bowl²⁵



Source: Collection of the authors

Figure 15 – Indigenous Necklace²⁶



Source: Collection of the authors

4. Help Kubai find the anaconda

Kubai looked down and, feeling the earthy ground beneath his feet, realized that there was a wide trail being made: it was the anaconda that crawled inventing a trail.

²⁵ Image description: square with black line edges and a white background. In the center, a surface in yellowish tone and on the surface, a brown indigenous cuia with some graphics.

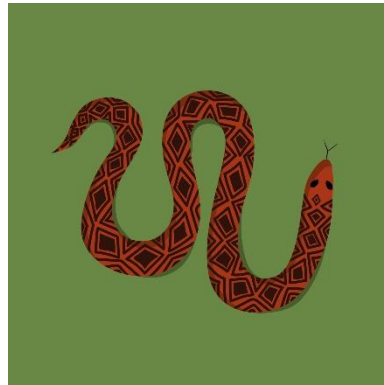
²⁶ Image description: square with black line borders and a white inner outline. At the center of the image, a yellowish background with graphics and the image of the part representing the chin, neck and beginning of shoulders of a human being. Carrying a necklace that appears to be made of balls in different sizes and shades of brown.

Figure 16 – Fish²⁷



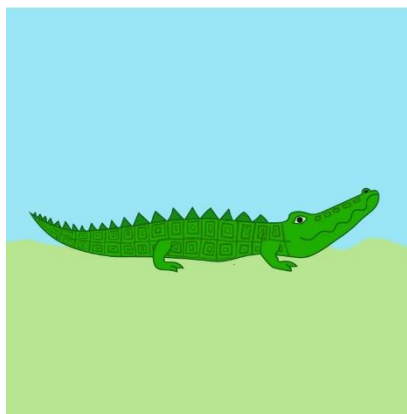
Source: Collection of the authors

Figure 17 – Anaconda²⁸



Source: Collection of the authors

Figure 18 – Alligator²⁹



Source: Collection of the authors

²⁷ Image description: square with black line borders and a white inner outline. In the center of the image, a black background with a green fish highlighted.

²⁸ Image description: square with black line borders and a white inner outline. In the center of the image, a green background with a prominent brown anaconda that has graphics on its body.

²⁹ Image description: square with black line borders and a white inner outline. In the center of the image, a blue background representing the sky and a ground floor in earthy hue, highlight a green alligator facing to the right.

I wonder what he's going to make up now.

Then Kubai, with his enchantments, followed the trail of the anaconda and reached the refreshing waters of the Rio Negro, where he dived deep down and continued to create and play.

Cultural interlocutions and the use of the tangible table: highlights

The Tangible Table can provide learning through the use of technology from the point of view of enriching the interaction between the child and the object of knowledge, mediated by the educator. The interaction with the Tangible Table can happen, initially, through the exploration of tactile and three-dimensional objects. The proposal for this intervention, at first, had the suggestion that children play and explore the miniatures of animals of the Guarani Mbya culture.

From the point of view of tangible technology, the table collaborates by offering the mediation of history as interactions with objects and pedagogical resources organized between the adult/mediator and children are made, or, considering the group of children, among them. For learning, it is a way to promote cognitive processes that involve various knowledge, such as language, logical thinking and motor coordination.

With the story of *Kubai, the Enchanted*, we established the approximation of the knowledge of indigenous cultures, being possible to promote the telling of this story by an educator. For the production of history, it was necessary an intercultural knowledge of the history of oral and mythological tradition of the Amazonian people of the Kubeo and the exchange with the knowledge of the Guarani Mbya people and with the three-dimensional animals.

Another important aspect to be emphasized refers to the contact with indigenous languages of different linguistic trunks and different from the Portuguese language. In the field of language, it proposes to know and value the cultures of indigenous peoples who have cultural resistance, promoting the revitalization of these languages.

Final considerations

Kubai is one of many characters who belong to the immense territory of children's stories that the indigenous people used to tell around a campfire. As an initial procedure, we organized research on indigenous cultures. The research was carried out in three stages: the first

was the analysis of indigenous children's books of various ethnicities; the second, the adaptation of a history of the Kubeo people; and the third, the organization of the use of history for the Tangible Table. The steps were cyclically fed back. The work with Kubai's story, organized at the tangible table, aimed to offer Assistive Technology in an inclusive educational context in Basic Education.

The story of Kubai the Enchanted took shape from the adaptations for use in the Tangible Table (TT), aiming to develop Assistive Technology in the inclusive educational context to tell the Kubai story through the Table with Tangible Interaction. As a secondary objective, we seek to develop a history of the Kubeo people, using tactile and three-dimensional images, ensuring tactile accessibility. In this movement, we consulted from the memories of peoples as a collective memory, struggle of indigenous authors, of indigenous histories, which are based on orality. To offer Kubai's story in a tangible way, we first thought of animals carved in wood, which, by the material itself, carry a look towards nature, just as their graphics carry a language all its own, only then to move to a technological reality.

Thus, animals, history and the table are three distinct tools designed for the same activity. We recognize that the motivation, both of the productions and publications of the books to which we have access today, is also the result/fruit of Law No. 11,645 (BRAZIL, 2008), which determines that the study of "Afro-Brazilian and Indigenous History and Culture" should be included in the guidelines and bases of national education. On the other hand, it is also easy to see that, on the eve of the 20th anniversary of the enactment of this law, urgent programs are made within schools, not only on calendar dates, but throughout the school year.

The history of the indigenous mythology of the Kubeo people, made available with audiovisual resources for the school scene, contextualizes and socializes the story in an accessible way with tactile and three-dimensional images for children. It is also possible to access the story in multiformat through the OMITIDO website. We would like to finalize this article by proposing that readers continue inviting children, all of them, to read stories of indigenous cultures and authors.

REFERENCES

BERGAMASCHI, Maria Aparecida. *Nembo'e. As long as the charm remains! Schooling processes and practices in Guarani villages*. Advisor: Profa Dr. Malvina Dorneles do Amaral. 2005. 270 f. Thesis (Doctorate) – Faculty of Education, Federal University of Rio Grande do Sul, Porto Alegre, 2005.

BONILLO, Clara; MARCO, Javier; CEREZO, Eva, BALDASSARRI, Sandra. Diseño of mejora activities of cognitive abilities for tabletops tangibles. **Proceedings of Interaction**, p. 31-39, 2015.

BRAZIL. **Law No. 11,645, march 10, 2008**. It amends Law No. 9,394 of December 20, 1996, modified by Law No. 10,639 of January 9, 2003, which establishes the guidelines and bases of national education, to include in the official curriculum of the school system the mandatory theme "Afro-Brazilian and Indigenous History and Culture". Brasília, DF, 2008. Available in: http://www.planalto.gov.br/ccivil_03/_Ato2007. Access: 30 Sep. 2021.

CORREA, François. **Los Kuwaiwa**: Creators of the universe, society and culture. Quito: Ediciones Abya-Yala, 1997.

EL RETORNO del Cubai. Direction of Luz Adriana Quigua. Production of Izabel Cristina Torres. 2012. (47 min.), son, color. Subtitled. Available in: https://youtu.be/miRLD_-IhUk. Access: 22 Sep. 2021.

FALCÃO, Taciana Pontual; GOMES, Alex Sandro. Tangible Interfaces for Education. *In*: BRAZILIAN SYMPOSIUM OF INFORMATICS IN EDUCATION, 18., 2007, São Paulo. **The anais** [...]. São Paulo: Mackenzie University, 2007. v. 1. Available in: www.researchgate.net/publication/269276360_Interfaces_Tangiveis_para_a_Educacao. Access: 30 Sep. 2021.

GEORGE, Iozodara Telma White of. **Mathematical knowledge of Guarani teachers from Paraná**. 2011. Dissertation (Master in Science and Mathematics) - Federal University of Paraná, Curitiba, 2011. Available in: <https://acervodigital.ufpr.br/handle/1884/27133?show=full>. Accessed: 22 Nov. 2020.

GLUZ, J. *et al.* Tangible Virtual Environment for Sensory Integration in Science Teaching in an Inclusive Perspective. **Brazilian Symposium on Informatics in Education**, p. 545, Oct. 2018. ISSN 2316-6533. Available in: <https://www.br-ie.org/pub/index.php/sbie/article/view/8011>. Access: 30 Oct. 2019.

HOFMAM, *Mauritius et al.* A Study on Fiducial Marks in Augmented Reality: Combining Line Detection with Camera Calibration. *In*: SYMPOSIUM ON VIRTUAL REALITY, 8., 2006, Bethlehem. **The anais** [...]. Bethlehem, PA, 2006. Available in: https://webserver2.tecgraf.puc-rio.br/~abraposo/pubs/SVR2006/SVR2006_rev_ret_Mauricio.pdf. Accessed: 30 Aug. 2021.

LUCIANO, Gersém José dos Santos. **Education for the management and domestication of the world between the ideal school and the royal school**: the dilemmas of indigenous school education in the Upper Rio Negro. 2011. 368 f. Thesis (Doctorate in Anthropology) - University of Brasília, Brasília, 2011.

MARTINS, Maria Sílvia Cintra (Org.). **Intercultural essays**: literature, culture and rights of indigenous peoples in times of globalization. Campinas, SP: Mercado de Letras, 2014. v. 1, p. 173-183.

MUNDURUKU, Daniel. **Indian stuff**: children's version. 3. Ed. São Paulo: Callis, 2019.

MUNDURUKU, Daniel. **Stories I've read and like to tell**. São Paulo: Ed. Calles, 2011.

MUNDURUKU, Daniel. Indigenous literature and new memory technologies. *In*: MUNDURUKU, Daniel. **Indian memories: an almost** autobiography. Porto Alegre, RS: Edelbra, 2016.

PACHAMAMA, Aline Rock. Authorship and activism of originating in the writing of history. *In*: DORRICO, Julie; DANNER, Lenno Francisco; DANNER. (Org.). **Contemporary Brazilian indigenous literature: authorship, autonomy, activism**. Porto Alegre, RS: Editora Fi, 2020. p. 119-128. Available in: <https://www.editorafi.org/765indigena>. Access: 20 Sep. 2021.

PASSERINO, Liliana Maria. **Projects developed at UFRGS include communication plugs for use with smartphones and an interactive table**. Interview with Giullia Piaia. June 22. 2018. Available in: <https://www.ufrgs.br/ciencia/tecnologias-assistivas-utilizam-realidade-aumentada-para-comunicacao-com-criancas-autistas>. Access: 20 Sep. 2021.

PASSERINO, Liliana Maria; BALDASSARI, Sandra. Mesas tangibles para la planificación cognitiva en alumnos con trastorno del espectro autista (TEA). *In*: ARNAIZ, Pilar *et al.* (Coords.). **Accesible and inclusive technology: achievements, resistance and challenges**. Murcia, Spain, 2017. Available in: <http://www.dominiopublico.gov.br/download/texto/me002878.pdf>. Access: Dec 12. 2019.

PASSERINO, Liliana Maria; ROSELLÓ, Teresa Coma; BALDASSARRI, Sandra. Interacción tangible para la Compensación Social de procesos mediados en niños con diversidad funcional. **Education**, v. 41, n. 3, p. 362-373, 2018. DOI: <https://doi.org/10.15448/1981-2582.2018.3.31732>.

PREUSS, Evandro. *et al.* E-DUB-A: A Tangible Educational Resource Editor in Inclusive Classes. *In*: INTERNATIONAL CONFERENCE ON ADVANCED LEARNING TECHNOLOGIES, 19., 2019, Maceió. **The anais [...]**. Maceió, AL: IEEE, 2019. Available in: <https://ieeexplore.ieee.org/document/8820875>. Accessed: 30 Aug. 2020.

SOUZA, Ely Ribeiro. Indigenous literature and copyright. *In*: DORRICO, Julie; DANNER, Lenno Francisco; DANNER, Fernando (Org.). **Contemporary Brazilian indigenous literature: creation, criticism and reception**. Porto Alegre, RS: Editora Fi, 2018. p. 37-38. Available in: <https://www.editorafi.org/438indigena>. Access: 20 Sep. 2021.

ULLMER, Hiroshi Brygg; Jacob, Robert. **Tangible Query Interfaces: Physically Constrained Tokens for Manipulating Database Queries**. Cambridge, MA: MIT Media Laboratory, One Cambridge Center, 5FL, n/a.

WRIGHT, Robin. The sacred traditions of Kuwai among the northern Aruaque peoples: structures, movements and variations. **Mana**, v. 23, n. 3, Rio de Janeiro, Sep./dez. 2017.

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