

Cuenta Cuentos: A Co-designed Board Game for Preserving the Language of the Comcaac

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Abstract: *Cuenta Cuentos* is a co-designed board game developed as a game-based learning strategy to support the preservation and intergenerational transmission of *Cmiiq̃ue litom*, the ancestral language of the *Comcáac* (Seri) people of Sonora, Mexico. The project emerged within a sixth-semester design course focused on social innovation and Radical Participatory Design, through a collaboration between design students, educators, linguists, and members of the community of the *Comcáac*. As part of the process, students participated in ludic experiences such as the mangrove-feather toy and the *hapap!* game, which allowed play to become a source of knowledge, inspiration, and design insight. These activities helped students understand play not only as a pedagogical strategy, but as a way to activate curiosity, reveal cultural meanings, and inspire more sensitive forms of co-creation. Also the students participated in field visits, conversations, prototyping, and playtesting activities that informed the conceptual, visual, and pedagogical structure of the final proposal. The resulting game invites players to collaboratively construct stories using illustrated 3D haptical cards inspired by oral traditions, natural environments, and symbolic cultural elements of the *Comcáac*. Designed for both oral and written modes of play, *Cuenta Cuentos* allows participants of different ages and literacy levels to engage in storytelling while practicing vocabulary, narrative structure, and linguistic expression. By emphasizing imagination, cooperation, and collective narrative construction, the game positions language learning as a shared social experience. *Cuenta Cuentos* contributes to game-based learning research by showing how analog games can function as culturally meaningful pedagogical tools that strengthen cultural identity and social cohesion. The project suggests that game design, when grounded in ethical co-design processes and local knowledge systems, can expand the educational role of games toward community empowerment and language revitalization.

Keywords: Game-based learning, Radical participatory design, Indigenous language revitalization, Comcáac, Cmiiq̃ue litom, Board games

1. Introduction

Indigenous languages face growing pressure from dominant languages, schooling systems, mass media, and participation in wider national cultures. Language revitalization therefore requires more than documentation or classroom instruction; it also needs spaces where language can be heard, practiced, remembered, and desired across generations. Game-based learning can support motivation, repetition, feedback, and meaningful engagement (Gee, 2003; Kapp, 2012; Whitton, 2018). However, the educational value of games should not be measured only through individual learning outcomes or technological innovation, but also through how games are created, who participates in their development, whose knowledge they carry, and what relationships they produce between designers and communities.

Cuenta Cuentos was developed in response to the need for accessible and culturally meaningful resources for practicing Cmiiq̃ue litom with children and families from Punta Chueca. Created through collaboration between design students, language educators, linguists, and community members, the project situates language learning within storytelling, visual recognition, and play. In doing so, it shifts attention from the game as a finished object to the social and pedagogical processes through which the game was imagined, tested, and refined.

2. Context: Cmiiq̃ue litom and Language Revitalization

Cmiiq̃ue litom, also known as the Seri language, is an isolated language spoken by the Comcáac people along the coast of Sonora, Mexico. The Comcáac primarily live in two towns within their territory: Punta Chueca (Socaaix), in the municipality of Hermosillo, and El Desemboque de los Seris (Haxöl lihom), in the municipality of Pitiquito. The language is spoken by approximately 1,000 people and has been described in different ways by scholars and institutions: as threatened, endangered, vulnerable, and, in other accounts, as a vibrant language still spoken by a large part of the community (Eberhard et al., 2023; Marlett, 2006, 2010). Recent studies, however, suggest a growing process of subtractive bilingualism among younger generations, in which Spanish increasingly replaces Cmiiq̃ue litom among school-age children (O'Meara et al., 2022; O'Meara et al., 2024).

UNESCO (2003) defines language vitality through several interconnected factors, including intergenerational transmission, number and proportion of speakers, domains of use, response to new media, availability of educational materials, community attitudes, and quality of documentation. These factors are relevant to the Comcáac context because the challenge is not only the number of speakers, but also where and how the language is used. Cmiique litom continues to appear in many aspects of everyday life, including household conversations and community affairs. Nevertheless, Spanish dominates formal education, most media content, websites, social media, and many forms of interaction with external institutions.

The school context is especially important. Although many children grow up hearing both Spanish and Cmiique litom, formal instruction is mostly conducted in Spanish. O'Meara (2015) notes that community members have identified the absence of language instruction in schools and the lack of written materials in Cmiique litom as major challenges. A diagnostic study in El Desemboque de los Seris, followed by preliminary work in Punta Chueca, identified a growing number of children who are passive speakers or non-speakers of the language (O'Meara et al., 2022; O'Meara et al., 2024).

At the same time, any discussion of language revitalization must recognize the complexity of bilingual aspirations within the community. Spanish proficiency can be seen by families as necessary for further education, employment, institutional navigation, and protection from discrimination. Rather, it requires culturally relevant strategies that allow children and young people to strengthen their ancestral language while also navigating broader social realities. Several initiatives support Cmiique litom and cultural vitality of the Comcáac, yet there is a continued need for didactic materials that are visual, interactive, accessible, and meaningful for different generations. This is where game-based learning can make a meaningful contribution. A board game can create a shared space where language becomes a living practice connected to stories, images, memory, and collective imagination.

3. Theoretical Framework

3.1 Game-based Learning, Play, and Language Practice

Game-based learning understands games as structured experiences capable of supporting learning through challenge, feedback, repetition, agency, and engagement (Gee, 2003; Kapp, 2012). Games can create conditions in which players willingly repeat actions, test hypotheses, negotiate meanings, and remain emotionally invested in a task. In language learning, these qualities are especially valuable because repetition and practice can become tiring when framed only as formal exercises. Through play, vocabulary, pronunciation, listening, interaction, and narrative expression can become part of an enjoyable social experience.

The distinction between gamification and game-based learning is important for this project. Cuenta Cuentos does not simply add points, rewards, or badges to an existing learning activity. Instead, it uses the game itself as a learning environment. Its mechanics invite players to build stories, listen to one another, negotiate narrative continuity, and activate words through visual and oral prompts. In this sense, the game is closer to serious play and playful learning than to superficial gamification (Deterding et al., 2011; Whitton, 2018). Analog games are particularly relevant in community-oriented language contexts. Unlike many digital tools, they do not require screens, connectivity, individual devices, or specialized infrastructure. They also favor face-to-face interaction, collective interpretation, and intergenerational participation. Recent work on Indigenous language board games also suggests that serious play can stimulate communication and reposition heritage languages as active forms of present-day use (Barreras & Kroskrity, 2025).

3.2 Participatory Design and Radical Participatory Design

Participatory Design (PD) emerged from the Scandinavian tradition of the 1970s, emphasizing workplace democracy and the active involvement of users in the design of technologies that affect them (Ehn, 1988). At its core, Participatory Design challenges top-down design processes by recognizing that those who live with the consequences of design should have a voice in its creation. Through collaboration, prototyping, dialogue, and mutual learning, Participatory Design expands the role of users from passive recipients to active contributors (Manzini, 2015).

For projects involving Indigenous communities, however, participation alone is not sufficient. Participatory processes can still become extractive if designers frame community members merely as informants, sources of inspiration, or validators of decisions already made elsewhere. Radical Participatory Design (RPD) responds to this limitation by foregrounding power redistribution, community ownership, governance, and authorship

(Udoewa, 2022). It calls for communities to participate not only in feedback moments, but also in the definition of problems, methods, values, priorities, and criteria for success.

Mörtberg and van der Velden (2015) argue that Participatory Design should not be reduced to a toolkit. It is also an ethical and political practice that makes visible the values embedded in design processes. This is particularly important in language revitalization, where design decisions can affect cultural representation, linguistic authority, and the ways in which knowledge is translated into educational materials. Radical Participatory Design therefore requires humility, accountability, and a willingness to decenter the designer as the primary author of change. In *Cuenta Cuentos*, this framework helped orient the project toward reciprocity. The goal was not to use Comcáac culture as visual content for a student project, but to co-create a pedagogical tool that could return to participating schools, educators, and children. The community's expertise, feedback, and priorities became the backbone of the process.

3.3 Place-conscious and Ludic Learning

Place-conscious education emphasizes that learning is shaped by the environments, communities, histories, and material conditions in which it occurs (Gruenewald, 2003). In this project, place was not only a fieldwork setting. It was a source of language, imagery, ecological knowledge, stories, and design criteria. Punta Chueca, the sea, the desert, Tiburón Island, local fauna, traditional objects, and oral narratives all contributed to the development of *Cuenta Cuentos*.

This perspective also aligns with Indigenous storywork, where stories do not merely illustrate knowledge but carry, organize, and transmit it (Archibald, 2008). Storytelling is therefore not an accessory to the game; it is the core pedagogical structure. By asking players to build stories together, the game activates memory, language, imagination, and cultural reference in a shared activity. It also allows learning to happen through participation rather than through direct explanation alone.

4. Methodology

4.1 Educational Setting

The project was developed in the course *Form, Function, Sense and Value*, offered in the sixth semester of the Design program at Tecnológico de Monterrey, Campus Sonora Norte. Since 2021, the course has focused on working with vulnerable communities through design for social innovation and inclusive design. Previous projects have engaged with people with visual functional diversity, neurodiversity, and regional Indigenous communities. At this point in the curriculum, students have developed maturity in research, conceptualization, critical thinking, and empathy.

The collaboration with the Comcáac community was facilitated by Fany Muchembled, a linguist with extensive experience in the preservation of Cmiiq̃ue litom. Her knowledge of horizontal intercultural methodologies and her long-standing relationship with the community were essential for building trust, coordinating field visits, and keeping community voices central throughout the project (Corona Berkin, 2019; Cornejo & Rufer, 2020). From the beginning, the project was framed as a Radical Participatory Design initiative in which community members would be active decision-makers rather than passive recipients of a finished proposal. The expected outcome was clearly articulated: the co-creation of didactic games for teaching and practicing Cmiiq̃ue litom, culminating in physical prototypes to be returned to participating schools, educators, and students. This return was important because reciprocity was treated as a methodological principle.

4.2 Fieldwork and Community Conversations

Students carried out two field visits to Punta Chueca. During the first visit, they conducted qualitative interviews and informal conversations with children, teachers, families, and language experts to understand the cultural context, community needs, and perceptions surrounding Cmiiq̃ue litom revitalization. Topics included daily routines, traditional festivities, symbolic cultural elements, language use at home and in school, as well as children's relationship with their ancestral language.

Several children shared that they understood Cmiiq̃ue litom but did not feel confident speaking or writing it. Some participants also observed that adolescents are beginning to show renewed interest in learning the language to communicate with elders. A local teacher, Noemi, described the Comcáac as deeply proud of their customs, with a strong connection to nature expressed through traditional celebrations. She emphasized the importance of revitalizing the language within and beyond the school, noting that visual and interactive resources can be more effective than text-based materials alone.

Community language experts also identified systemic challenges, including the dominance of Spanish-language media, limited formal instruction, and intergenerational gaps in language use. René, a language teacher, explained that he offers weekly classes for children, youth, and adults, sometimes outdoors, where students practice naming natural elements. These testimonies highlighted repetition, memory, sensory experience, and collective practice as key elements in the game's design. During the second visit, students presented initial concepts and low-fidelity prototypes to children from the community. Playtesting sessions with children around eight years old provided feedback on game mechanics, visual clarity, narrative engagement, and overall format. The response was positive, especially around the storytelling component. The children's input helped refine the game so that it better reflected their interests, levels of understanding, and forms of engagement.

4.3 Additional Sources of Design Insight

Beyond the scheduled visits, the team had the opportunity to receive feedback from Sócrates, a Seri lawyer and singer from Punta Chueca, closely connected to the language and traditions of his community. His comments helped validate symbolic and narrative elements of the game, while his stories about the sea, local fauna, and traditional practices expanded the project's visual universe. One member of the design team also participated in an immersive visit to Isla Tiburón, a sacred and ecologically significant territory for the Comcáac. Guided by Seri women, the experience included a traditional face-painting ritual and explorations of marine and desert landscapes. This encounter helped shape the game's visual development, inspiring illustrations of turtles, stingrays, dancing figures, mythical creatures, desert plants, and celestial bodies.

After integrating community feedback, the team tested a high-fidelity prototype in different contexts to explore its potential as a universal and intergenerational tool. It was tested with two age groups at a primary school in Hermosillo. Younger children had more difficulty following the structure, while older children quickly understood the rules, laughed, and stayed engaged. Additional informal playtests with families and classmates helped refine elements such as clarity, pacing, replayability, group size, complexity, and age appropriateness. These rounds showed that the game could spark curiosity and conversation, while still requiring further validation in the Comcáac community.

5. Ludic Encounters as Design Input

5.1 The Mangrove-Feather Toy

A central part of the process involved learning from existing forms of play. During a prior visit to Punta Chueca, a young Comcáac man shared an object made from natural elements: a pelican feather inserted into a mangrove fragment. When thrown properly, the object fell in a nosedive, struck the sand, and embedded itself. Its purpose, he explained, was to calm anxiety, linking the artifact to play, leisure, landscape, and ancestral knowledge. Ethnographic sources mention pelican bones and heads used as toys, pelican feathers in games of luck, and Seri records of a game played with a bird feather inserted into a shell (Luque Agraz & Robles Torres, 2006; Moser & Marlett, 2010).

The mangrove fragment was not carved or extracted, but collected after reaching the beach. It came from the hardened tip of a propagule, a floating element associated with mangroves surrounding Tiburón Island. The artifact revealed an ecological design logic with no industrial pretension: it did not require complex manufacturing, external energy, or wasteful materials. Its simplicity opened a conversation about design, sustainability, material intelligence, and intergenerational learning. It also allowed students to understand that play can contain technical, ecological, emotional, and linguistic knowledge at the same time.

The object later became a pedagogical reference for students developing language games. It showed that play can activate curiosity without announcing itself as a lesson. In class, the artifact was associated with the Cmique litom lexical items *iháasim* and *ina*, glossed in the Seri dictionary as "feathers of arrow" and "feather" respectively (Moser & Marlett, 2010). Through this encounter, two words became attached to a bodily and visual memory: seeing the object, throwing it, watching it fall, and discussing its meaning. The mangrove-feather toy therefore worked as a design principle: a game can teach because it invites action, attention, and repetition.

5.2 Hapapl! as Playful Language Practice

The second ludic encounter took place in the classroom. If the mangrove-feather moved the classroom toward the world of the Comcáac, the hapapl! activity brought elements from that world into the learning space. Drawing on the Comcáac term *hapapl*, used for items strung as necklaces, including seeds, bones, shells, and shark vertebrae (Moser & Marlett, 2010), the activity proposed a competition among design student teams. Students reconstructed Cmique litom words using materials from Punta Chueca: shells, shark vertebrae, fishing

line, and sand. Shells represented vowels and vertebrae represented consonants; both were hidden under the sand inside a box. One student searched for pieces by touch, while another arranged them in sequence. The game ended when the bracelet was completed and the team shouted: hapapl!

This activity transformed language into a tactile, spatial, and collective task. Students did not only read or repeat words; they searched for them, assembled them, wore them, and celebrated them. Through this playful action, the object of learning became code, and the act of learning became memory. The activity also helped students understand creative reciprocity. Learning words in Cmiique litom while assembling bracelets made the later donation of games to the community feel less like a moral gesture and more like a return grounded in affection, responsibility, and care. Hapapl! embodied co-creation, play, and the exchange of knowledge, values, and virtues.

These ludic encounters shaped the final design criteria for Cuenta Cuentos. They suggested that a language game should not rely only on correctness, competition, or translation. It should also create desire, memory, cooperation, sensory engagement, and narrative possibility. In other words, play was not merely a method applied after research; it became a source of knowledge and a way of understanding how language can remain alive through use.

6. Cuenta Cuentos: Game Design and Learning Mechanics

Cuenta Cuentos is a board game designed to strengthen the community's connection to Cmiique litom through play. The game seeks to expand the contexts in which the language can be used, while supporting oral and written transmission of Comcáac culture. It offers an invitation to imagine and create stories through illustrated cards inspired by the community's worldview, oral tradition, and surrounding natural environment. These images were developed from cultural research, community conversations, stories, and direct observation of daily life in Punta Chueca.

The game includes 32 illustrated 3D haptic cards that function as narrative prompts. Many of the illustrations reference well-known stories, such as the boy who turned into a shark or the giant who grows wings in the rain. Others draw from natural elements deeply connected to the community, such as mountains, the sea, the desert, turtles, stingrays, plants, stars, and dancing figures. Some scenes portray extraordinary interactions between humans, animals, and the natural world, inviting players to imagine a world where beings, objects, and environments are animated and interconnected.



Figure 1: Cuenta Cuentos boardgame validation

The game is intended for 2 to 10 players aged eight and above. It enables both oral and written storytelling. In oral mode, players co-create a single collective narrative, taking turns to continue the story. In written mode, multiple individual stories can emerge from the same visual prompts. The gameplay revolves around three main categories: genre, which defines the theme of the story; pace, which introduces changes or turns in the plot; and story, which inspires narrative development. Each player contributes to the unfolding narrative, enabling creativity, linguistic expression, listening, and interaction.

The learning mechanics of Cuenta Cuentos are directly connected to language practice. Story cards activate vocabulary through visual association. Turn-taking supports listening and oral interaction. Collective storytelling encourages coherence, reference-tracking, pronunciation, and sentence construction. Written mode supports writing, reading, and narrative organization. The visual symbols create bridges between cultural memory and semantic recall. Most importantly, intergenerational play allows children, teachers, parents, and elders to participate in the same learning experience, creating a shared space for language practice.

The game also aligns with language competences outlined by the Common European Framework of Reference for Languages (Council of Europe, 2020), including listening, speaking, reading, writing, and interaction. While the CEFR was not created specifically for Indigenous language revitalization, it provides a useful vocabulary for identifying the linguistic actions that the game encourages. Players practice vocabulary, pronunciation, sentence construction, narrative continuity, and collaborative expression. The game also accommodates different levels of literacy by allowing oral participation even when reading or writing skills are limited.



Figure 2: Cuenta Cuentos boardgame elements

Cuenta Cuentos is not intended to replace formal language instruction. Rather, it offers a complementary environment where language can be used with pleasure, imagination, and social meaning. Its analog format makes it accessible for classrooms, homes, and community spaces with limited technological infrastructure. In this sense, the game functions as both a pedagogical tool and a cultural mediator: it allows Cmiique litom to appear as a language capable of producing stories, images, emotions, and collective worlds.

7. Discussion

The development of Cuenta Cuentos suggests that game-based learning can be expanded beyond efficiency-oriented models of educational design. In this project, the value of the game is not limited to whether players acquire specific vocabulary after a single session. Its value also lies in the relationships it creates: between

children and elders, between students and community members, between visual symbols and oral memory, and between design education and language revitalization.

First, the project shows the importance of play before instruction. The mangrove-feather toy and the hapap!! activity demonstrated that learning can emerge from curiosity, repetition, touch, movement, and collective enjoyment. These experiences helped students understand that language learning does not need to begin with formal explanation. It can begin with the desire to play, name, repeat, and share. Cuenta Cuentos extends this principle by making storytelling the central mechanic. Players are not simply asked to identify correct answers; they are invited to construct meaning together.

Second, the project frames co-design as creative reciprocity. In community-oriented design, participation must be more than consultation. The process must ask what returns to the community, who benefits from the collaboration, and how local knowledge is recognized. Cuenta Cuentos attempted to respond to these questions by developing physical prototypes that will be delivered to local educators and by treating community feedback as a design criterion rather than a final validation step. This is especially important in Indigenous contexts, where cultural elements can be easily extracted, aestheticized, or transformed into academic products without sufficient accountability.

Third, the project highlights the relevance of analog games for language revitalization. Digital platforms can be powerful, but they are not always necessary or appropriate. A board game can be low-cost, portable, durable, and usable without electricity, internet, or personal devices. It can support eye contact, oral practice, laughter, disagreement, correction, and storytelling among players. For Cmiique litom, this matters because the challenge is not only to preserve words, but to create living situations where the language can circulate.

The project also has limitations. Although preliminary playtests were conducted, the long-term validation of Cuenta Cuentos within the Comcáac community remains pending. The final educational value of the game cannot be fully determined until local teachers and community members decide how and when to use it. Future research should document classroom implementation, intergenerational use, vocabulary retention, player engagement, and community perceptions after repeated sessions. It should also examine how the game may need to be modified according to age group, literacy level, dialectal preferences, and teaching context.

Despite these limitations, the project offers a useful model for game-based learning. It shows that games for language revitalization should not only be designed for users, but with communities, through processes that respect cultural authority, local priorities, and reciprocal return. When this happens, a game can become more than an educational object. It can become a shared space where language, memory, imagination, and care are practiced together.

8. Conclusion

Cuenta Cuentos demonstrates how a co-designed analog board game can support Cmiique litom language practice through storytelling, visual association, oral interaction, and intergenerational play. Developed through a design course focused on social innovation and vulnerable communities, the project brought together students, educators, linguists, children, and community members to create a pedagogical tool grounded in the cultural and linguistic context of the Comcáac people.

The project contributes to game-based learning by showing that analog games can be culturally meaningful, accessible, and socially rich tools for language revitalization. Its contribution is not only technical or instructional. It lies in the way play can activate memory, curiosity, cooperation, and narrative imagination. Cuenta Cuentos also contributes to design education by showing how students can learn from community knowledge, territory, material culture, and ludic practices, while questioning extractive models of design intervention. The project remains open. Its most important stage will occur when the prototypes return to local educators and the community decides how to use, adapt, or transform them.

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Ethics Declaration: This project was developed as part of an educational design course in collaboration with community members, educators, linguists, and children from Punta Chueca. Participation in interviews, conversations, and playtesting activities was voluntary and oriented toward academic and educational purposes. No sensitive personal data is disclosed in this paper. The project followed principles of respect, consent, reciprocity, cultural sensitivity, and community-defined relevance. The final prototypes will be returned to local educators, who will decide how and when they may be used in classroom or community contexts.

AI Declaration: AI tools were used during the preparation of this paper to support language editing, grammar correction and text refinement. The authors reviewed, revised, and approved all AI-assisted outputs. The conceptual framework, research process, analysis, interpretation, and final academic decisions remain the sole responsibility of the authors.

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