



Biocentric micropolitics for decolonial educational transformation through ancestral medicinal knowledge

Micropolíticas biocéntricas para la transformación educativa decolonial mediante saberes medicinales ancestrales

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Submitted: 09-04-2026 | Revised: 20-05-2026 | Accepted: 31-07-2026 | Published: 12-08-2026

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ABSTRACT

Introduction: The persistence of epistemic hierarchies in education limits the effective incorporation of community and ancestral knowledge into the curriculum, especially in intercultural contexts. **Objective:** To analyze how the participatory implementation of biocentric micropolicies articulated with ancestral medicinal knowledge contributed to the decolonial educational transformation at the Azari Alternative Education Center. **Methodology:** A qualitative study was developed using Participatory Action Research with a decolonial orientation between March and June 2026. 36 actors from the educational community participated: 20 students, 3 teachers, 6 family members, 4 elderly people bearers of community memory, 2 practitioners of traditional medicine and 1 community representative. Participant observation, semi-structured interviews, testimonies, documentary review and reflection circles were applied; The information was analyzed through inductive coding, thematic construction, triangulation and collective validation. **Results:** Four nuclei emerged: epistemic revaluation, intergenerational recovery, strengthening of care and reciprocity, and curricular articulation with Natural Sciences and Chemistry. **Conclusion:** Biocentric micropolicies favored the dialogue of knowledge, cognitive justice and community participation, strengthening the articulation between curriculum, memory and territory.

Keywords: decolonial education; ancestral knowledge; interculturality; biocentric micropolitics; medicinal plants.

RESUMEN

Introducción: La persistencia de jerarquías epistémicas en la educación limita la incorporación efectiva de saberes comunitarios y ancestrales al currículo, especialmente en contextos interculturales. **Objetivo:** Analizar cómo la implementación participativa de micropolíticas biocéntricas articuladas con saberes medicinales ancestrales contribuyó a la transformación educativa decolonial en el Centro de Educación Alternativa Azari. **Metodología:** Se desarrolló un estudio cualitativo mediante Investigación-Acción Participativa de orientación decolonial entre marzo y junio de 2026. Participaron 36 actores de la comunidad educativa: 20 estudiantes, 3 docentes, 6 familiares, 4 personas mayores portadoras de memoria comunitaria, 2 practicantes de medicina tradicional y 1 representante comunitario. Se aplicaron observación participante, entrevistas semiestructuradas, testimonios, revisión documental y círculos de reflexión; la información se analizó mediante codificación inductiva, construcción temática, triangulación y validación colectiva. **Resultados:** Emergieron cuatro núcleos: revalorización epistémica, recuperación intergeneracional, fortalecimiento del cuidado y la reciprocidad, y articulación curricular con Ciencias Naturales y Química. **Conclusión:** Las micropolíticas biocéntricas favorecieron el diálogo de saberes, la justicia cognitiva y la participación comunitaria, fortaleciendo la articulación entre currículo, memoria y territorio.

Palabras clave: educación decolonial; saberes ancestrales; interculturalidad; micropolíticas biocéntricas; plantas medicinales.

INTRODUCTION

Bolivian education develops within a constitutional framework that recognizes cultural plurality, interculturality, and decolonization as principles linked to the construction of the Plurinational State. The Political Constitution of the State and Law No. 070, the Avelino Siñani-Elizardo Pérez Education Law, establish the foundations for articulating educational processes with the knowledge, identities, languages, and practices of the indigenous originary peasant nations and peoples [1,2]. This regulatory framework challenges the idea of a curriculum based exclusively on universalized knowledge and opens the possibility of relating school education to the historical and territorial experiences of communities.

However, the existence of normative recognition does not by itself guarantee a transformation of the power relations that pervade the production and legitimation of knowledge. The colonality of knowledge operates when certain epistemic systems are presented as universal while others are reduced to tradition, belief, or folklore [3]. In education, this hierarchization can be expressed in the selection of content, in the authority assigned to certain actors, and in the separation between school knowledge and community knowledge. Recent studies show that the integration of indigenous knowledge in schools continues to face institutional, curricular, and pedagogical barriers, especially when it is incorporated in a merely decorative manner, without the participation of knowledge holders or the transformation of teaching practices [4,5].

The decolonial perspective proposes displacing that hierarchical relationship through practices capable of recognizing epistemic plurality and building learning spaces in which different ways of knowing can enter into dialogue without being reduced to a simplistic equivalence. In Latin America, experiences of critical, environmental, and intercultural education show that educational decolonization acquires depth when it connects with territory, community, autonomy, and concrete ways of life [6]. Guzmán Valenzuela [7] points out that decolonizing the curriculum entails reviewing not only what content is taught, but also who defines legitimate knowledge, from what places it is produced, and what pedagogical relationships are established. In Bolivia, Moreno Cely et al. [8] have shown that the dialogue of knowledges can become a counter-hegemonic path to transform formative processes when academic and community knowledge are linked in a collaborative relationship.

A field where this tension is particularly visible is ancestral medicinal knowledge. Law No. 459 [9] recognizes Bolivian ancestral traditional medicine, its actors, practices, and transmission of knowledge, while Law No. 300 [10] situates the relationship with Mother Earth within the framework of *Vivir Bien*. This legal recognition coexists with processes of loss, fragmentation, or weakening of intergenerational transmission. In Andean communities of Peru and Bolivia, Mathez-Stiefel and Vandebroek [11] documented that knowledge about medicinal plants is distributed differentially among households and generations, which underscores the importance of everyday and family learning spaces. Similarly, Ouma [12] highlights that the transmission of traditional medicinal knowledge occurs through situated learning, observation, coexistence, and intergenerational practice, and that these processes can be affected by migration and socio-spatial transformations.

The educational integration of this knowledge requires caution. Recognizing traditional medicinal practices does not amount to demonstrating the clinical efficacy of plants or preparations. The present study is situated at the educational and cultural level: it analyzes how the school can become a space for the recovery, dialogue, and problematization of community knowledge, without conducting pharmacological trials or biomedical evaluations. This delimitation is especially important because the cultural, pedagogical, and epistemic value of a body of knowledge can be studied without extrapolating therapeutic claims that the qualitative design is not capable of establishing. The Pan American Health Organization has insisted on the need to approach traditional medicine with cultural respect and, at the same time, with criteria of evidence, safety, and responsible integration [13].

In the Centro de Educación Alternativa (CEA) Azari, a gap was identified between the content of Natural Sciences and Chemistry and the community knowledge related to medicinal plants. Signs of devaluation of family knowledge, limited integration of community actors in pedagogical activities, and progressive loss of practices transmitted by older people were also observed. In response to this situation, a Participatory Action Research experience was developed that used the communal preparation of traditional plant-based remedies, recognition walks, interviews with knowledge holders, and reflection circles as pedagogical mediations to articulate curriculum, territory, and memory.

Based on this problem, the objective of the study was to analyze how the participatory implementation of biocentric micropolitics articulated with ancestral medicinal knowledge

contributed to a decolonial educational transformation at CEA Azari. Biocentric micropolitics is understood as the set of situated educational practices that displace anthropocentrism and epistemic hierarchy through relationships of care, reciprocity, recognition of Mother Earth, and community participation. The expected contribution does not consist in presenting a universal pedagogical recipe, but rather in documenting a localized experience and examining what subjective, intergenerational, community, and curricular transformations emerged from it.

The coloniality of knowledge describes the persistence of structures that classify and hierarchize knowledge even after the formal end of colonialism. Quijano [3] links this logic to the modern constitution of power and to the naturalization of categories that place Europe as the center of valid knowledge production. In the educational field, coloniality manifests when the curriculum establishes certain epistemologies as a universal norm and relegates other experiences to peripheral content. Therefore, a decolonial pedagogy is not limited to adding cultural references to the curriculum, but rather seeks to modify the conditions of production, circulation, and legitimization of knowledge.

Walsh [14] understands decolonial pedagogies as insurgent practices that are constructed in spaces of resistance, re-existence, and collective life. From this perspective, teaching also implies creating conditions so that memories, territories, languages, and historically subalternized experiences can intervene in defining what counts as knowledge. Menon et al. [15] show that this task requires teacher reflexivity, since educators also participate in epistemic structures and habits that must be problematized. Educational decolonization, therefore, cannot be reduced to a normative declaration; it requires revising pedagogical relationships, mechanisms of authority, and forms of evaluation.

Rivera Cusicanqui [16,17] contributes the notion of *ch'ixi* as a way of thinking about the coexistence of heterogeneous elements without forcing them to merge into a homogeneous synthesis. This perspective is pertinent to the dialogue between ancestral knowledges and scientific knowledges: curricular articulation should not convert community knowledge into a lesser version of school science, nor should it present both systems as identical. The challenge consists in establishing zones of encounter where differences, tensions, and complementarities can be recognized. Seehawer and Breidlid [18] term this process dialogue between epistemologies and emphasize that its quality depends on critical and constructive interactions between knowledge systems, not on their simple juxtaposition.

The biocentric approach used in this study moves away from the idea of nature as an external resource and places life, interdependence, and care as organizing principles of educational practice. Bolivian Law No. 300 [10] recognizes Mother Earth in a relationship of complementarity and balance, while Escobar [19] proposes a relational understanding of territory in which humans and non-humans participate in interdependent webs of life. In the classroom, this orientation can translate into activities that link scientific content with observation of the environment, care responsibilities, and discussion of environmental impacts.

Biocentricity, as developed in the CEA Azari experience, is not formulated as an abstract doctrine but as a micropolitics: small shifts in who teaches, where learning takes place, what objects are considered bearers of knowledge, and how participants relate to each other. The presence of older adults and community knowledge bearers modifies pedagogical authority; the journey through the territory displaces the classroom as the only learning space; the collective elaboration of traditional products turns practice into a starting point for discussing mixtures, properties, materials, and processes; and the circles of reflection enable the valuing of knowledge from shared experience.

This orientation aligns with proposals that link indigenous knowledge and science education from a perspective of sustainability and contextual relevance. Anor [20] highlights that integrating indigenous knowledge into science teaching can broaden the understanding of the relationship among environment, culture, and sustainability when superficial incorporation is avoided. Madden [21] warns that learning indigenous teaching models implies recognizing both the contents and the traditional forms of transmission.

Ancestral medicinal knowledge forms part of cultural knowledge systems that articulate experience, territory, memory, and care practices. In the present study, it is approached as community knowledge attributed to plants and traditional preparations, not as clinically proven claims. This distinction allows its historical and educational importance to be recognized without confusing tradition of use with demonstrated therapeutic efficacy.

The transmission of this knowledge is closely linked to intergenerational relationships. Ouma [12] shows that traditional medicinal learning occurs through observation, accompaniment, and participation in specific practice settings. Mathez-Stiefel and Vandebroek [11], in Andean communities of Peru and Bolivia, found that the distribution of medicinal knowledge varies among

households and actors, providing evidence that its continuity depends on social networks and learning contexts. In Ecuador, Caballero-Serrano et al. [22] also documented the relationships among traditional ecological knowledge, medicinal plant diversity, and domestic cultivation spaces, highlighting the importance of everyday environments for biocultural conservation.

From a decolonial pedagogical perspective, intergenerational recovery does not mean freezing knowledge as static heritage. Knowledge is transformed, discussed, and reinterpreted when it comes into contact with new generations and with other knowledge systems. Chaves Pérez [23], based on the *sentipensar* in Nasa practices, highlights that knowing can involve body, affect, territory, and community deliberation. This idea is relevant for an educational experience in which smelling, touching, preparing, remembering, and conversing are part of the learning process and the reconstruction of bonds with family memory.

METHODS

A qualitative study was conducted using Participatory Action Research (PAR) with a decolonial orientation. This approach was chosen because the purpose was not to observe an educational practice externally, but to construct, together with the actors of CEA Azari, a process of problem identification, pedagogical action, reflection, and production. PAR was understood as a practice of knowledge committed to transforming reality and to the participation of those who are typically regarded only as sources of information [24].

The study was conducted at the Alternative Education Center (CEA) Azari. The experience articulated content from Natural Sciences and Chemistry with community knowledge related to medicinal plants, family memory, care, and relationship with Mother Earth. The process followed the Practice-Theory-Assessment-Production (P-T-V-P) sequence, used in the educational experience to start from contextual situations and knowledge, problematize them, contrast them with curricular content, and produce community-oriented responses or products.

36 people participated, selected through intentional sampling by criteria: 20 students from CEA Azari, aged between 16 and 38 years; 3 teachers linked to Natural Sciences and Chemistry; 6 mothers, fathers, or family members; 4 people aged 61 to 78 years recognized for their community memory; 2 traditional medicine practitioners with experience in the local use of plants; and 1 community representative. Actors with direct links to CEA Azari, availability to participate in the experience, and knowledge of the context were included. For students, participation in at least 75% of the scheduled activities was also considered. People with occasional participation, absence during most of the process, or lack of informed consent were excluded. The diversity of profiles was deliberately sought to integrate school, family, and intergenerational perspectives in Participatory Action Research.

The fieldwork was conducted between March and June 2026. Eight participatory workshops of approximately 120 minutes were carried out, organized into four cycles of Practice-Theory-Valuation-Production (P-T-V-P). The process included two community walks for plant recognition and recovery of local memories, activities for making traditional preparations for pedagogical purposes, and three reflection circles of approximately 90 minutes. Each cycle began with the identification of experiences and prior knowledge, continued with their problematization and contrast with Natural Sciences and Chemistry content, incorporated a collective valuation of learning, and culminated in a production or community action. The sequence allowed decisions about activities, interpretations, and adjustments to emerge progressively during the action research.

The information production techniques were participant observation, semi-structured interviews, collection of testimonies, documentary review, and reflection circles. An observation guide organized into five axes was used: prior knowledge, participation, community interaction, valuation of knowledge, and curricular articulation, as well as a field journal to record significant episodes after each activity. The interviews were conducted using a guide of ten open questions about family memory, traditional uses attributed to plants, intergenerational transmission, and educational experiences; they were conducted with students, teachers, and community knowledge holders, with an approximate duration of 30 to 45 minutes. With the participants' authorization, the interviews were audio-recorded and transcribed verbatim. For document analysis, a review matrix of the curriculum and the Natural Sciences and Chemistry lesson plans was used. The reflection circles followed a thematic guide aimed at evaluating changes, tensions, learnings, and proposals for continuity.

The records were organized by technique, date, actor, and activity. The principal investigator first conducted a complete reading of the transcripts, field notes, documentary matrices, and circle

reports; then carried out an inductive coding of meaning units related to valuation or devaluation of knowledge, intergenerational transmission, care, reciprocity, relationship with nature, and curricular articulation. Related codes were grouped into subcategories and subsequently into four interpretative categories. To increase credibility, the preliminary categories were contrasted with observations and documents and returned to the participants in the last reflection circle, where interpretations, nuances, and possible disagreements were discussed. The procedure approximates the logic of inductive thematic analysis described by Braun and Clarke [25], interpreted from the decolonial horizon and the participants' language.

Triangulation was carried out through contrast among testimonies, interviews, observations, curricular documents, and collective reflections. One finding was considered consistent when it could be traced in at least two different sources or when it was recognized, discussed, and nuanced by participants during the reflection circles. A record of analytical decisions was maintained to preserve the relationship between evidence, code, subcategory, and final category. Co-interpretation with participants sought to reduce an extractive reading of the material and strengthen the dependability and confirmability of the analysis. Presenting any reference to healing properties as clinical evidence was avoided: expressions about plants and preparations were analyzed exclusively as traditional uses, attributed knowledge, or documented community practices.

The pedagogical actions included recognition of plants in the context, conversations with elders and knowledge bearers, community preparation of traditional preparations, such as syrups, ointments, creams, and infusions, analysis of mixtures and components from the Chemistry content, reflection on pollution and care for Mother Earth, and community exchange activities. These actions served simultaneously as a pedagogical intervention and as spaces for information production characteristic of IAP.

The study received institutional authorization from the administration of CEA Azari to conduct educational and research activities in its facilities and with community participation. Before any information was produced, the purpose of the study, the voluntary nature of participation, and the right to withdraw without consequences were explained. Adults provided informed consent; for minor participants, consent was obtained from their legal guardians and assent from the students. Testimonies were anonymized using pseudonyms or role and age descriptors. Audio recordings, transcriptions, and field notes were stored in a protected digital folder with access restricted to the responsible researcher, and their deletion was scheduled after 5 years. Community knowledge was used only for academic and educational purposes, avoiding its commercial appropriation or the disclosure of information that participants considered confidential. As this was qualitative educational research of minimal risk, no clinical, diagnostic, prescription, or biological sample collection procedures were performed.

RESULTS

The qualitative analysis allowed the findings to be organized into four interrelated categories: epistemic revaluation and subjective transformation; intergenerational recovery of knowledge; care, reciprocity, and community fabric; and situated curricular articulation. The categories are not understood as linear effects or as generalizable results, but as interpretive patterns constructed from testimonies, observations, and reflection circles developed during the experience.

Among the most visible changes was the shift from shame or disqualification of family knowledge toward an explicit appreciation of its meaning. A 17-year-old student expressed: "Before, I was ashamed to say that my grandmother heals with herbs. I thought they were 'old people's things'." The phrase reveals an internalized hierarchy between school knowledge and family knowledge. During the workshops, this appreciation began to change, as plants, stories, and domestic practices were turned into legitimate objects of inquiry and pedagogical discussion.

The same student linked the elaboration of a traditional preparation with affective memory and collective work: "It was not just a cream; it was Mamá Julia's knowledge, the smell of my childhood, and the work of all of us, there, in that little jar." More than demonstrating a therapeutic property, this testimony provides evidence of a change in the educational meaning of the produced object: the preparation became a mediator between family memory, sensory experience, group participation, and school content. The observed transformation was, therefore, epistemic and subjective: what was initially considered minor knowledge acquired recognition as part of the student's history and learning.

In the observations, there was also greater participation in tasks, exchange of materials, and willingness to explain procedures to other classmates. These behaviors were not interpreted as

quantitative indicators of improvement, but as situated evidence of a more active relationship with the formative process.

The participation of older adults and community knowledge bearers temporarily modified the usual distribution of pedagogical authority. Students left the exclusively school-based space to ask about, observe, and listen to preparation methods, local names, and memories about traditional uses. A 78-year-old participant summarized the meaning of this experience by stating: “Memory was not lost; it was sleeping, waiting for someone or one young person to come and wake it up with an honest question.”

The testimony suggests that the recovery of knowledge did not consist solely of gathering information about plants. The student’s question functioned as recognition of the elder as a subject of knowledge. In the reflection circles, this relocation of authority was associated with the possibility of the school acting as a bridge between generations, especially when the curricular content offers a concrete reason to converse with families and return to the classroom with new questions.

It was also identified that knowledge did not appear as a homogeneous repertoire. The narratives varied according to family experience, age, and trajectory. This diversity prevented the presentation of ancestral medicine as a single system and allowed for the idea that community knowledge is situated, dynamic, and open to discussion.

The collective elaboration of traditional products generated spaces for cooperation and redistribution of tasks. Observation records indicate respect, mutual help, and lending of materials among students. Instead of focusing only on the final product, the reflection circles allowed for recognition of the importance of the shared process: preparing, conversing, remembering, comparing, and deciding as a group.

An expression recorded during the experience synthesized this dimension: “Healing ceased to be a solitary act in my kitchen; now it is a conversation, an act of the entire community.” Within the framework of this study, the phrase is interpreted as a community representation of care and not as evidence of health efficacy.

Table 1. Emerging categories and qualitative evidence

Category	Representative evidence	Interpretive synthesis
Epistemic revalorization	“Before, I was ashamed to say that my grandmother heals with herbs...” (student, 17 years old).	Shift from the disqualification of family knowledge toward its recognition as a formative resource.
Intergenerational recovery	“Memory was not lost, it was asleep...” (older participant, 78 years).	The pedagogical question restores older adults as interlocutors and bearers of knowledge.
Care and reciprocity	Records of mutual aid, material lending, collective elaboration, and community exchange.	Learning is configured as a relational practice of co-responsibility.
Curricular articulation	Use of traditional preparations for working with mixtures, substances, components, and contamination.	The context functions as a starting point to connect community experience and Natural Sciences/Chemistry content.

Note. Prepared by the authors based on the qualitative records of the study.

Table 2. IAP actions and identified changes

Action	Actors involved	Educational articulation	Identified change
Recognition of plants and contextual knowledge	Students, families, and knowledge bearers	Observation of the environment, biodiversity, nature-society relationship	Greater willingness to recognize family and territorial knowledge.
Intergenerational interviews and conversations	Students and older community members	Orality, memory, communication, and information recording	Recognition of older people as epistemic authorities.
Elaboration of traditional preparations	Students and teachers with community support	Mixtures, substances, classification, and transformation processes	Greater participation and connection between daily practice and curricular content.
Reflection circles and exchange activities	Educational community	Assessment, reciprocity, critical analysis, and care	Strengthening the collective dimension of learning and the dialogue of knowledges.

Note. Prepared by the authors based on the activities and records described in the original manuscript.

The experience moved the medicinal theme from the individual domestic sphere to a public space of pedagogical conversation.

The exchange and reciprocity activities, including the barter fair described in the records, reinforced the community dimension of the process. The value assigned to the products was not limited to their material utility; it was also related to the work time, cooperation, and the memory embedded in their production.

The experience made it possible to link practices from the context with content from Natural Sciences and Chemistry. The preparation of infusions, syrups, ointments, and creams was used to discuss homogeneous and heterogeneous mixtures, classification of substances, components, transformations, and the effects of pollution. The starting point ceased to be solely an abstract explanation and came to include objects and problems recognizable to the students.

This articulation did not imply equating traditional and scientific explanations. The pedagogical work distinguished between community knowledge about uses attributed to certain plants and the school analysis of properties, mixtures, or components. This differentiation made it possible to avoid a false clinical validation and, at the same time, to recognize that family knowledge could formulate relevant questions for scientific learning.

The curricular articulation also modified the meaning of production. Students did not create products only as a manual activity, but rather as an opportunity to link practice, theory, assessment, and production. In this way, the P-T-V-P cycle operated as a situated learning sequence that connected territory, memory, and curriculum.

DISCUSSION

The findings show that the educational transformation observed at the CEA Azari did not depend solely on incorporating content about medicinal plants, but rather on altering the pedagogical relationships that defined who could teach, what experiences could enter the classroom, and how they connected with the curriculum. This result coincides with da Silva et al. [4], who warn that the integration of indigenous knowledge in school is more significant when it ceases to be a superficial inclusion and is linked to pedagogical practices, community actors, and concrete contexts. Similarly, Yip and Chakma [5] point out that teaching indigenous perspectives requires sustained relationships with communities and knowledge holders, not just added curricular materials.

The epistemic revaluation identified in the students' dialogues aligns with the Latin American discussion on curricular decolonization. Garcia-Arias et al. [6] show that intercultural and pluriversal experiences acquire transformative potential when they question the separation between school, territory, and community life. In the CEA Azari, the change did not consist in replacing scientific knowledge with ancestral knowledge, but in opening a space where both could be interrogated from their own criteria. This relationship approximates the dialogue between epistemologies proposed by Seehawer and Breidlid [18]: a critical interaction that recognizes differences and avoids reducing a system to the language of the other.

The experience is also related to the criteria of curricular decolonization formulated by Guzmán Valenzuela [7], especially with regard to recognizing historically marginalized knowledge and transforming power relations in teaching. However, the case of CEA Azari provides a particular feature: decolonization was materialized through small, situated actions—asking a grandmother, walking through the environment, collectively preparing a product, discussing a testimony, exchanging knowledge—that functioned as micropolitics. This emphasis allows transformation to be understood not only as a large-scale institutional reform, but also as a modification of everyday practices that reorder the authority and value of knowledge.

The finding on intergenerational recovery is consistent with the literature on the transmission of traditional medicinal knowledge. Mathez-Stiefel and Vandebroek [11] showed, in Andean communities of Peru and Bolivia, that the continuity of this knowledge depends on specific family and social networks. Ouma [12] documented that medicinal learning is sustained in situated, observational, and intergenerational processes, subject to transformations due to migration and territorial changes. At CEA Azari, the school acted as a mediator of that transmission by turning the interview, memory, and community practice into pedagogical activities. The contribution of this case lies in showing that the educational institution can help revive intergenerational conversations without appropriating the knowledge as if it were decontextualized data.

Testimonies associated with affective memory and bodily knowledge are also related to the notion of *sentipensar* analyzed by Chaves Pérez [23]. The student's phrase about the smell of

muña, the memory of their childhood, and collective work shows that learning was not exclusively cognitive: it integrated sensations, memories, identity, and participation. This dimension helps explain why the experience could affect the subjective valuation of family knowledge. Menon et al. [15] warn that decolonial pedagogy requires revisiting binaries and recognizing the entanglements of coloniality itself; in this study, this revisiting appeared when students questioned the idea that only written school knowledge could be considered valid.

Regarding science education, the results support the possibility of linking indigenous knowledge and scientific content without confusing their statuses. Anor [20] highlights that indigenous knowledge can broaden sustainability education when integrated in a contextualized manner. Madden [21] emphasizes that the educational inclusion of indigenous knowledge must address not only the content, but also the ways in which such knowledge is transmitted. At the CEA Azari, practice, observation, and intergenerational conversation allowed Chemistry and Natural Sciences concepts to be approached from problems and objects of the context.

This point also differentiates the experience from one merely instrumental integration. Traditional preparations were not used as evidence of therapeutic efficacy, but as pedagogical devices to work on mixtures, materials, components, contamination, care, and memory. The distinction is important because the study did not include pharmacological analyses, clinical trials, or verification of doses or safety. Therefore, statements about medicinal plants should be understood as attributed uses and knowledge recognized by the community. This delimitation protects the coherence of the design and prevents an educational study from extrapolating conclusions typical of biomedical research.

The implications for curriculum management are three. First, contextualization requires that curricular contents be connected with real questions from the territory and not only with examples added at the end of a class. Second, community participation can expand pedagogical authority through the presence of actors who possess situated knowledge. Third, the dialogue of knowledge needs reflection and contrast procedures that allow recognizing differences, avoiding essentialisms, and preventing folklorization. The Bolivian experience described by Moreno Cely et al. [8] shows that counter-hegemonic formative processes can be strengthened when different knowledge systems are articulated through dialogue and collaboration; the case of CEA Azari transfers that logic to a community educational practice centered on Natural Sciences and medicinal knowledge.

The study has limitations. The experience was developed in a single educational center, with 36 intentionally selected participants and over a period of four months, so the findings cannot be statistically generalized nor assumed to be representative of other educational contexts. The active participation of the researcher in the IAP could influence the interactions and the interpretation of the records; to reduce this bias, triangulation of sources, recording of analytical decisions, and feedback of categories in the reflection circles were used. The design also does not allow establishing the permanence of the changes beyond the studied period, so future research should carry out longitudinal follow-ups and comparisons between centers. Furthermore, clinical efficacy, safety, dose, or pharmacological composition of the preparations were not evaluated; any medicinal reference is restricted to traditional uses and documented community meanings.

CONCLUSIONS

The implementation of biocentric micropolicies at CEA Azari made it possible to articulate ancestral medicinal knowledge, community participation, and Natural Sciences and Chemistry content within a Participatory Action Research experience. The findings show that the main contribution of the proposal was not the creation of products per se, but the transformation of pedagogical relationships that defined the value of knowledge, the authority to teach, and the links between school, family, community, and territory.

The revaluation of family knowledge was expressed in testimonies of students who went from shame or disqualification to a positive identification with the memories of their families. Likewise, the participation of older people reactivated intergenerational relationships and positioned them as legitimate interlocutors of the formative process. The practices of cooperation, reciprocity, and collective reflection reinforced an understanding of learning as a community experience and not only individual.

The curricular articulation demonstrated that contextual knowledge can function as a starting point for problematizing scientific content without erasing the differences between knowledge systems. The study, due to its qualitative educational design, does not demonstrate clinical efficacy of plants or preparations; it documents traditional medicinal uses and analyzes their pedagogical,

cultural, and epistemic value. This precision must be maintained in any future version of the article.

Overall, the experience suggests that a decolonial educational transformation can be built through situated practices that recognize the plurality of knowledges, redistribute pedagogical authority, and strengthen the relationship between curriculum and territory. The CEA Azari experience provides a concrete route based on 8 workshops, community walks, intergenerational dialogue, and reflection circles to articulate school and community knowledge without subordinating them or confusing their validation criteria. Its main contribution lies in showing that the recovery of ancestral medicinal knowledge can constitute a pedagogical mediation for cognitive justice, community memory, and curricular contextualization, provided that an explicit delimitation is maintained between its educational-cultural value and any claim of clinical efficacy.

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FUNDING

None.

CONFLICT OF INTEREST

It does not exist.

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