

Mobile Scientific, Technological, and Humanistic Outreach Initiatives for Educational Inclusion Across Nine Socio- Educational Regions Of The Colegio De Bachilleres De Chiapas

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— Abstract —

The purpose of this paper is to present selected results obtained during the development of the project entitled “Itinerant Cultural and Artistic Center for Scientific, Technological and Humanistic Outreach with Populations in Vulnerable Conditions in the State of Chiapas” (CCyAI). The project was implemented from 2021 to 2022 across nine regional coordination offices of the Colegio de Bachilleres de Chiapas (COBACH), and funded by the National Council of Science and Technology (CONACYT), currently the Ministry of Science, Humanities, Technology and Innovation (SECIHTI). The relevance of this project lies in its response to the need for inclusion and informal science education as a means of fostering scientific vocations among upper secondary education (EMS) and promoting equitable access to knowledge among the general population in communities with high and very high levels of marginalization in the state of Chiapas. The methodological approach adopted was Participatory Action Research (PAR), which enabled a multisited and multilocal intervention structured around the administrative educational regions known as COBACH regional coordination offices.

The main objective of the project was to establish mechanisms for educational and community inclusion in scientific, technological, humanistic, and cultural knowledge through artistic practices, while also promoting the revaluation of local and regional knowledge systems. The project was carried out in nine educational sites selected based on the following criteria: location in communities with high or very high levels of marginalization; prioritization of indigenous, rural, and peri-urban populations; the presence of children of primary education age; and the existence of at least one upper secondary education institution. These educational spaces functioned as open community venues aimed at fostering informal learning processes, with particular emphasis on children, women, and older adults, who are more likely to experience conditions of vulnerability regarding access to academic and scientific knowledge.

Keywords:

Educational inclusion, science outreach, local culture, knowledge.

The Colegio de Bachilleres de Chiapas (COBACH) is the Upper Secondary Education (EMS) subsystem with the largest territorial presence in the state and each year, according to INEE (2019), enrollment is usually almost 50% of the student youth population of different municipalities; its 338 educational centers are distributed in urban, rural and indigenous contexts of 105 municipalities with populations in very high and highly marginalized conditions. Since 2019, due to the health contingency caused by the SARS-CoV-2 virus, the causative agent of the COVID-19 disease, the inequalities and historical precariousness of many of the communities where COBACH educational centers are located intensified. This exposed the existing social, educational, technological, and information and communication access gaps.

Faced with these conditions of health emergency, it became important to establish strategies implemented from the higher secondary education centers themselves, since they act as educational institutions and at the same time as spaces of community social cohesion, which facilitates ensuring access to scientific, technological, humanistic and artistic knowledge for the general population at the local, regional and global levels.

Since then, COBACH has actively collaborated in different projects aimed at solving socio-educational problems with other higher education institutions and research centers, which subsequently allowed the institution to apply for the project entitled “Itinerant Cultural and Artistic Center for Scientific, Technological and Humanistic Outreach with Populations in Vulnerable Conditions in the State of Chiapas” (CCyAI) implemented in COBACH and funded by the National Council of Science and Technology (CONACyT), currently the Ministry of Science, Humanities, Technology and Innovation (SECIHTI). Other higher education institutions also participated, alongside nine municipal governments with their respective cultural centers (casas de la cultura), 27 schools from different educational subsystems and levels, and 76 COBACH educational centers, achieving an educational reach and intervention across 30 municipalities and 124 localities in the State of Chiapas.

The objective of the project was to promote democratic access to science, technology, humanities, art and culture for those populations that have historically suffered conditions of vulnerability in the state of Chiapas, Mexico, through the implementation of a model of itinerant cultural and artistic center that favors processes of participation and social appropriation of knowledge and knowledge, educational inclusion and strengthening of the community fabric.

The research was developed under a qualitative approach based on Participating Research, which is characterized by directly involving communities in all phases of the research process, privileging the production of collective knowledge from shared experience and critical reflection on practice. This type of research is not limited to describing social phenomena, but rather seeks to generate processes of social transformation through the participation of the stakeholders

involved; furthermore, it is considered a relevant path to understanding complex socio-cultural dynamics and promoting significant changes through collective action (Leaman & Cárcamo, 2021).

In the same vein, participatory research through a Participatory Action Research (PAR) method allowed for the articulation of educational and cultural intervention with situated analysis processes, in which methodological decision-making was adjusted to the specific conditions of each site. An example of this methodology was observed at one of the sites where artistic workshops were implemented with children and youth populations; in this context, the activities were adjusted based on direct dialogue with teachers and parents, who proposed thematic adaptations aligned with local cultural practices.

During the development of the action research, the observations of the facilitators, the narratives of the participants, as well as exit surveys of the user population of the workshops offered, were recorded as inputs for collective reflection and continuous improvement of activities. Similarly, in another venue, the planning of artistic exhibition was built jointly with local actors, who defined the contents and forms of presentation, which allowed to recover community knowledge and strengthen the sense of belonging. These examples show how the participating research favored the contextual adaptation of the intervention and the generation of contextualized knowledge, adhering to the principles of inclusion, interculturality and active participation described in the project.

FROM ADMINISTRATIVE EDUCATIONAL REGIONALIZATION TO SOCIO-CULTURAL REGIONALIZATION

In this section provides a contextual overview of the territorial, social and administrative organization of COBACH, that is, a region with an administrative plan for higher secondary education. In the state of Chiapas, the administrative division is based on territory, politics, and population density, but at the same time, other cultural, linguistic, and knowledge-based regions overlap or intertwine, forming a diversity of constantly interrelated elements that are also marked by conflict.

When referring to an established region or planned region, such as the fifteen socio-economic regions into which the state of Chiapas is divided or the twenty-four electoral districts that in turn are located with fifteen other health jurisdictions, it does not mean that they are irrevocable regions. However, they can serve as a starting point, insofar as these historical divisions, organizations, and boundaries help us understand the frameworks of meaning, the meanings themselves, and the multiple relationships of interweaving, continuity, exclusion, and inclusion. (Castillo, 2018, p.70).

The Colegio de Bachilleres de Chiapas is the Colegio de Bachilleres with the largest number of schools nationwide (338 schools), distributed across 105 of the state's 124

municipalities. Most of these schools are located in rural (184 schools) and indigenous (112 schools) communities with high and very high levels of marginalization. In fact, the largest percentage of educational centers are not campuses, but are organized as Centers of Upper Secondary Distance Education (CEMSaD), which means they lack the necessary infrastructure, teaching staff, and services to serve their student population; this coincides with the lack of access to basic services in the communities where they are established.

In 2020, Chiapas had a total of 5,543,828 inhabitants; 2,837,881 women and 2,705,947 men. Most of its population, 50.28%, resided in rural areas and 49.72% in urban areas (INEGI, 2020). In turn, in 2019, according to the Ministry of Finance of the State of Chiapas, 1,886,104 people self-registered as an indigenous population (36.1% of the inhabitants of the state); of which, 1,361,249 (26.10%) were speakers of an indigenous language and did not speak Spanish (Hernández et al., 2022, p.31)

The multicultural context with large gaps of territorial inequality undoubtedly demands such a large number of educational centers, but it also demands strategies of attention to diversity and coverage that, often, far from generating horizons of possibilities, become segregating spaces. Faced with this reality, one of the challenges of the subsystem, especially in a pandemic context, was to prepare socio-educational diagnoses and opt for a comprehensive and inclusive educational offer.

In 2019, one of the main issues to face the COVID-19 disease was the widespread misinformation and the risk that this meant for the communities where the COBACH educational centers were located, due to their wide territorial coverage; it was good to participate as a subsystem of higher secondary education in the project "Perceptions about COVID-19 in highly marginalized areas in Chiapas: design of information strategies on this emerging disease" in collaboration with the Universidad de Ciencias y Artes de Chiapas (UNICACH). The application of a first instrument allowed to have as background the knowledge of the conditions of the most remote and vulnerable communities where some of the educational centers are located, as well as the first perceptions of the young people regarding the new health, educational and technological situation. At the same time, having a Cultural Center of Science and Technology in one of the area coordinations triggered the possibility of thinking about its itinerancy to reach other spaces that hardly have the opportunity to move to museums, artistic or technological centers.

The above allowed to base the project that was implemented from 2021 to 2022, in nine educational venues in which exhibitions, workshops and various events designed and executed jointly with the participating communities were carried out. These actions were based on active, collaborative and participatory methodologies, aimed at the inclusion of the population in general and from an intercultural approach, with a gender perspective and critical-reflexive thinking. In this way, the intervention transcended the instrumental nature of the activities

to consolidate itself as a formative and transformative process, in which local experiences, knowledge and contexts became central axes of the collective construction of knowledge and the revaluation of shared regional elements.

Current literature argues that active and participatory methodologies, such as project-based learning or collaborative learning, generate more inclusive teaching-learning processes, by promoting interaction, meaningful participation and joint problem solving, which increases educational equity in diverse contexts (Jaramillo-Martínez et al., 2024). Educational inclusion, understood as the possibility for the entire student population to participate equally and with a sense of belonging to this population, is favored when pedagogical practices incorporate adaptive and collaborative strategies that address the cultural and contextual differences of the groups in each locality (Yépez-Moreno, 2023; Matovelle-Zamora et al., 2023).

Similarly, the recovery and adaptation of the multisituated methodology with a contextualized research perspective made it possible to adjust the themes and strategies to the specific realities of each educational venue or region, which coincides with contemporary approaches to participatory research that recommend adapting methodological designs to the particularities of the field of study to better understand the dynamics of inclusion (Navarro-Montaño et al., 2022).

From this perspective, the integration of collaborative strategies, the active involvement of the community and the adaptation of educational actions to specific contexts contribute significantly to the strengthening of inclusive educational practices, by promoting learning environments sensitive to the cultural and social diversity existing in schools (Romero Parra et al., 2023). This approach thus contributes to the generation of reflective-critical knowledge in educational practice, which positively affects the quality of learning and the exercise of gender equity and intercultural respect in each of the nine contexts where the project was implemented.

The topics addressed during the project were: environmental stewardship, local and regional history, astronomy, the exact sciences and their applications in everyday life, laboratory setups, the use of ICT and devices that allow knowing how virtual reality works, prevention of violence and school harassment, gender violence, respect for diversity. To ground these themes, the formats of workshop, reading circles, observation of the medium, exhibitions, film-documentary sample, dance and dance representative of each region, use of mobile experimental laboratories and mobile devices that integrated apps or pre-loaded material were used.

These activities were carried out through inter-institutional collaboration, alliances that allowed the incorporation of film cycles by the Consejo Nacional para la Cultura y las Artes (National Council for Culture and Arts, CONACULTA by its acronym in Spanish), workshops on health and prevention of dating violence by ICATECH, plaster, health, painting and marimba workshops by the Organización Civil Misión Cultural 72, Misiones Culturales de Chiapas [Civil Organization Mission Cultural 72, Cultural Missions of Chiapas]. Workshops on gender and reflections on masculinity were also conducted by ninth-semester

education students from the C-IV Faculty of Humanities at the Benemérita Universidad Autónoma de Chiapas in Tapachula.

From the perspective of innovation—a concept that originates in the business world—this study aligns with the view put forth by Schumpeter (1934/2008). For this author, innovation is a complex and non-routine process; it involves overcoming obstacles, inertia, and resistance inherent in the system, requiring exceptional abilities and the involvement of extraordinary individuals. In his words, “carrying out a new project and acting in accordance with an established one are as different as building a road and walking along it” (Nasar, 2014, p. 219). This distinction is relevant to the analysis of innovative processes in social and educational contexts, where the introduction of new practices often faces resistance comparable to that described in the economic sphere.

Applied to the field of education, this translates into the implementation of disruptive projects that seek to transform the traditional pedagogical paradigm, in line with the proposals of the Nueva Escuela Mexicana [New Mexican School]. This project explores the perceptions of the integration of technology into the classroom from the perspective of educational innovation. To this end, the use of technological tools such as tablets, augmented reality glasses, telescopes, interactive science labs, projection screens, and mobile apps was proposed. It is essential to note that these proposals were designed to operate in both connected and disconnected environments, addressing the need for implementation in locations with limited or no internet connectivity, and using open and easily accessible resources.

Finally, beyond addressing educational needs based on the political-administrative division of an educational subsystem, the CCyAI project made it possible to trace or superimpose a dotted line representing another possible sociocultural path, shaped by the interconnection of ethnicity, language, available natural resources, socially useful knowledge related to the countryside, climate, healthcare, and the administration of justice—but above all, the cultural and artistic knowledge shared among each host community.

RESULTS AND EXPERIENCES FROM THE IMPLEMENTATION OF THE TRAVELING CULTURAL AND ARTISTIC CENTER

An analysis of the attendance lists at each location of the Centro Cultural y Artístico Itinerante (CCyAI) revealed that the program reached 30 municipalities, 124 localities, and 76 COBACH schools. A total of 13,475 attendees were recorded, representing significant coverage given the baseline of 14,316 COBACH students enrolled at the various locations and an estimated general population of 67,253 people. It should be noted that an additional 10% of unregistered attendees is estimated (Hernández et al. 2022).

The participation of both older adults and children in early childhood education—including preschool and elementary school—is a key aspect of the project’s results. This demonstrates that the initiative was not limited solely to the COBACH

student body, but rather generated broader interest in the acquisition of knowledge across different social sectors, while also highlighting the interconnection between different educational levels or subsystems within the same educational level. This, in turn, opens up the possibility of understanding knowledge and wisdom beyond the classroom—that is, applying everyday knowledge in a school setting, but also to incorporate the knowledge, wisdom, and practices of communities into formal educational programs.

It was found that opportunities for accessing knowledge are not limited exclusively to the programs of the National Education System, but are also found in the survival practices of the women and men in each region. Thanks to the democratization of information, new ways of approaching and conceiving of knowledge are emerging—based on the principle of the right to access and justice—as exemplified by this proposal from CCyAI, which in a sense represented a period of educational “open house” and served to highlight and revalue other forms of knowledge that have been excluded from formal educational settings.

Through dramatic readings, puppetry, and art, young people can address and reflect on local and national social issues. At the same time, they explore cross-cutting themes from a socio-emotional perspective through art. In organizing each venue, every effort was made to ensure it served as an inclusive space for children, youth, and non-student seniors, opening up opportunities for learning, art, and recreation to the general public. An atmosphere of empathy and connection was fostered between each participating group and the CCyAI workshop facilitators.

Another notable outcome was the focus on strategies implemented through the use of playful and technology-based teaching techniques, which proved appealing to the participants. Guided by the principle of the reasonable use of technological devices, a model of educational support was proposed that enhances teaching and learning processes through the use of audiovisual resources that are engaging and relevant to young people.

CONCLUSIONS

Using a variety of outreach methods and implementing public address systems in the local language tailored to each region has had a significant impact, as it allowed us to engage the local population in each host city—not just the student body. Furthermore, according to the feedback gathered, in some areas this was the first time an event for the entire community had been held with the aim of disseminating scientific and technological knowledge, as previous events had tended to focus more on entertainment or politics.

It has been very rewarding to see how children and young people got involved in the various activities, and how the local community embraced the cultural center, with municipal governments and various organizations adding their own activities and workshops centered on local knowledge. Some of the workshops offered

focused on wicker weaving, embroidery, agricultural knowledge, crafts, dance, and more, with each location contributing what it deemed appropriate based on its own artistic and scientific knowledge and expertise.

One of the transformations in terms of technological tools was the shift in how cell phones are used—both for educational and recreational purposes—which helped bridge the digital and generational divides. This does not, of course, eliminate the gap that still exists in connectivity and access to certain technological resources, which has prompted us to closely monitor the projects proposed by COBACH that involve working with offline resources or school search engines providing access to scientific and technological information without an internet connection. This also enables participation in cultural and artistic activities through the use of technological tools such as apps, thereby integrating art, culture, and technology. The significance of this research for the field of regional studies in Chiapas lies, first, in bringing to light a sociocultural, educational, and artistic region that overlaps with a political-administrative region; and second, in the situated, sensitive, and dynamic exercise of regionalization based on a methodological interplay between Participatory Action Research, multi-local intervention, and other methods that enabled the recovery of experiences and reflections from the local population itself—where regions are not limited solely by administrative boundaries, but are constituted symbolically, historically, and culturally through the lived experiences of those who inhabit, traverse, and transform them.

Along these same lines, the implementation of this project and research made it possible to carry out a regionalization exercise at different times and levels. During the diagnostic phase, regionalization helped shape the initial proposal for establishing the intervention sites; subsequently, during the CCyAI's itinerant visits, it was possible to identify shared practices, discourses, knowledge, and imaginaries among the COBACH educational community (teachers on exchange, students from municipal or local centers, and centralized administrative staff), as well as among the local resident population and visitors.

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