

Fundamental Research Paper

DOI: [10.53681/c1514225187514391s.37.383](https://doi.org/10.53681/c1514225187514391s.37.383)

BRIDGING EPISTEMOLOGIES: RETHINKING CO-DESIGN PRACTICE ROOTED FROM LOCAL EXPERTISE IN MARGINALIZED SLUM COMMUNITIES OF INDONESIA AND MEXICO

Tendiendo puentes entre epistemologías: Repensando la práctica del co-diseño a partir de la experiencia local en comunidades marginadas de barrios informales en Indonesia y México

ABSTRACT

This paper critically examines the practice of co-design in marginalized urban communities through comparative case studies in Campana-Altamira (Monterrey, Mexico) and Kampung Gedong Pompa (Jakarta, Indonesia). Drawing on in-depth interviews, field-based reflections, and direct involvement in ongoing community-based workshops, we analyze how epistemic hierarchies, institutional logics, and inherited assumptions about expertise influence participatory design efforts in urban slums. Both communities, while considered “marginalized,” are highly connected to technological infrastructures and have access to global narratives; yet they are often reduced to passive recipients of externally driven interventions. Our findings reveal that co-design efforts, while well-intentioned, often fall into extractive or paternalistic patterns that fail to meaningfully integrate local knowledge. Despite the rhetoric of participation, design processes risk reproducing outsider-centric models unless epistemological shifts are made. We argue for reframing co-design as a reciprocal and situated learning process rooted in social epistemology and behavior change intervention ontology—one that sees local communities not as knowledge gaps to be

RESUMEN

Este artículo examina críticamente la práctica del co-diseño en comunidades urbanas marginadas mediante estudios de caso comparativos en Campana-Altamira (Monterrey, México) y Kampung Gedong Pompa (Yakarta, Indonesia). Con base en entrevistas en profundidad, reflexiones de campo y participación directa en talleres comunitarios, analizamos cómo las jerarquías epistémicas, las lógicas institucionales y los supuestos heredados sobre la experticia influyen en el diseño participativo en barrios informales. Ambas comunidades, aunque consideradas “marginadas”, están conectadas a infraestructuras tecnológicas y narrativas globales; sin embargo, suelen ser reducidas a receptoras pasivas de intervenciones externas. Nuestros hallazgos muestran que los esfuerzos de co-diseño, aun bien intencionados, caen en patrones extractivos o paternalistas que no integran el conocimiento local. Pese a la retórica participativa, los procesos de diseño tienden a reproducir modelos centrados en actores externos si no hay un cambio epistemológico. Defendemos replantear el co-diseño como un proceso recíproco y situado de aprendizaje, enraizado en la epistemología social y en la ontología de la intervención en cambio de comportamiento,



SAVIRA ARISTI¹
Conceptualization / Writing /
Investigation,
ORCID: [0009-0000-3008-9147](https://orcid.org/0009-0000-3008-9147)



DANIEL ALDRETE ONDARZA²
Writing—original draft /
Investigation
ORCID: [0009-0008-2827-7171](https://orcid.org/0009-0008-2827-7171)



VIRLIANY RIZQIA PUTRI³
Writing—original draft, review
& editing,
ORCID: [0009-0004-2351-5813](https://orcid.org/0009-0004-2351-5813)



HISA MARTINEZ NIMI¹
Supervision / Investigation,
ORCID: [0009-0007-7876-8895](https://orcid.org/0009-0007-7876-8895)



KENTA ONO¹
Resources / Supervision,
ORCID: [0009-0006-1455-7645](https://orcid.org/0009-0006-1455-7645)

¹Chiba University, Japan

²Tecnológico de Monterrey, Mexico

³Kanazawa University, Japan

Date submission:

08/09/2025

Date Acceptation:

30/10/2025

Correspondent Author:

Savira Aristi, System Planning
Laboratory Chiba University 1-33
Yayoi-cho, Inage-ku, Chiba 263-8522,
Japan,
23wd8306@student.gs.chiba-u.jp

filled, but as experts of their own realities. The paper explores the ontological and epistemological tensions between institutional agendas and lived experience, emphasizing the need to move beyond universal models toward more context-sensitive engagements. We propose a set of actionable recommendations to guide future co-design projects, especially those involving academic actors such as university students conducting social service. This study contributes to the development of more equitable and contextually grounded approaches to co-design, broadening efforts to decolonize participatory design by situating knowledge production within the lived realities and strengths of the Global South.

que reconozca a las comunidades locales no como vacíos por llenar, sino como expertas de sus propias realidades. El artículo aborda las tensiones ontológicas y epistemológicas entre agendas institucionales y experiencia vivida, subrayando la necesidad de superar modelos universales hacia compromisos sensibles al contexto. Proponemos recomendaciones prácticas para futuros proyectos de co-diseño, en especial los que involucran a actores académicos como estudiantes universitarios en servicio social. Este estudio aporta al desarrollo de enfoques de co-diseño más equitativos y contextualizados, ampliando los esfuerzos por descolonizar el diseño participativo al situar la producción de conocimiento en las realidades y fortalezas del Sur Global.

KEYWORDS

Decolonizing design; Co-design; Global south; Local knowledge; Social service.

PALABRAS CLAVE

Descolonizando el diseño; Co-diseño; Sur global; Conocimiento local; Servicio social.

1. INTRODUCTION

To truly understand the context, one must begin by observing in silence, then ask questions, and only after that, offering any opinions.
- Víctor José González Fregoso (Parra, V. 2024)

Community-led development is often idealized in participatory frameworks, yet in practice, external institutions frequently set the agenda. Even when claiming facilitation, development agencies typically “own the tools, choose the topics and ultimately shape and direct the processes” (Colom, 2013), reinforcing dominant positions (Sintomer et al., 2008). A central site of this tension is co-creation, which ideally promotes shared decision-making, but in practice often replicates top-down dynamics (Pearce et al., 2020). Co-design, a subset of co-creation focused on collaboratively developing solutions, is similarly at risk. Research shows that such processes often maintain or deepen institutional power imbalances (Udoewa, 2022). The invitation to participate may raise local expectations, but if ultimate control over decisions remains with the institution, the process risks becoming performative. Given the above challenges, scholars and practitioners are increasingly calling for a shift in how co-design is conceptualized and practiced. Traditional models of co-design must evolve from one-way teaching paradigms to genuine reciprocal learning processes.

Indonesia and Mexico offer compelling comparative cases for examining these co-design dynamics. Both are Global South nations shaped by colonial histories and enduring structural inequalities, yet each provides a distinct cultural and institutional context. In Mexico, co-design has been applied across diverse settings, including marginalized urban districts, youth, and indigenous communities, and adapted to cultural contexts, such as renaming “storyboarding” to *Viñetas de Pláticas* for Latina mothers (Beltrán-Grimm, 2023). However, despite its potential, many initiatives remain top-down. For example, Mexico’s *servicio social*, a mandatory undergraduate community

service requirement (Sarasola Sánchez-Serrano et al., 2019), is frequently implemented without genuine community involvement. Reframing this as a co-design platform could move students beyond charity models, positioning communities as knowledge partners with lived expertise.

In Indonesia, co-design cannot be generalized across its diverse cultural landscapes. Practices are shaped by local collectivism, adaptability, and occasionally, political constraints (Setiawan et al., 2018). Government programs like the Designer Dispatch Service (DDS) aim to bridge professional designers with small-scale craft producers (Triharini et al., 2024), while figures like Singgih Kartono exemplify grassroots, community-centered design (Crosby, 2019). Similar to Mexico, Indonesia's *Kuliah Kerja Nyata* (KKN) requires university students to engage in community service, with growing efforts to embed co-design principles in design education (Aristi & Putri, 2024). These initiatives suggest a broader shift toward integrating co-design into educational frameworks, though challenges remain in ensuring they truly reflect local voices.

This paper seeks to interrogate and reimagine co-design through the lived experiences of community practitioners in Mexico and Indonesia. We ask: Why do ostensibly participatory initiatives often fail to overcome top-down dynamics, and what alternative approaches might foster more equitable collaboration? To explore this question, we draw on in-depth interviews (IDIs) and our experience in co-designing.

2. SITES CONTEXT

2.1. Campana-Altamira (Monterrey, Mexico)

Our first study site is Campana-Altamira, a marginalized informal neighborhood nestled in the highland periphery of Monterrey, Nuevo Leon, Mexico. This area includes 15 neighborhoods and is home to more than 20,000 residents. It is located near important economic centers, offers various labor opportunities, yet faces considerable challenges, including a 96% poverty rate (Iniciativa Campana-Altamira, n.d.). Residents experience urban segregation in access to infrastructure; for example, basic services like electricity and water are deficient (González Sánchez, 2022). The area has long faced institutional neglect and political clientelism, with drug-related violence further disrupts its social fabric and everyday life.

At the same time, the community possesses a strong social fabric and local knowledge traditions that provide a foundation for co-design. Many residents expressing pride in their colonia and maintaining relatively strong relationships with their neighbors (Centro CEMEX-Tec para el Desarrollo de Comunidades Sostenibles, 2021). More often, sponsored initiatives in this area emphasized *convivencia*—communal coexistence—as a pathway to strengthen social ties and enhance neighborhood security (Parra, 2024).

2.2. Kampung Gedong Pompa (Jakarta, Indonesia)

The second site, Kampung Gedong Pompa, is a low-income riverside neighborhood located in North Jakarta. It is classified as a *kampung kota*, or urban *kampung*, referring to informal settlements that have developed organically within the city. These neighborhoods are often characterized by high population density, limited infrastructure, and blend of rural and urban socio-cultural dynamics. Kampung Gedong Pompa is located along coastal floodplains and is highly vulnerable to environmental and social stresses. The community also lives under threat of forced evictions as authorities pursue redevelopment and flood-mitigation projects.

Studies have highlighted the ability of urban *kampungs* to adapt through community participation and informal settlement strategies, which can mitigate the impacts of urbanization (Astuti et al., 2024). Resilience is a key theme in urban studies focused

on such communities, encompassing not only the ability to withstand physical changes but also the cultural integrity and social capital that remain pivotal in times of distress.

3. METHODOLOGY

This research uses a qualitative case study approach to explore co-design dynamics in two urban slum communities. Data collection methods included in-depth interviews, participant observation, and reflections gathered during multiple co-design workshops. Primary data sources consist of two long-form interviews: one with a senior social worker in Campana-Altamira and another with the community leader (*Pak RT*) in Kampung Gedong Pompa. Thematic analysis was used to identify patterns related to participation, local knowledge, epistemic hierarchies, and the evolving role of external actors in co-design processes.

4. RESULTS

4.1. Co-Design in Campana-Altamira

The Campana-Altamira Polygon became a focal site for the Post-Urban Living Innovation (PULI) program, a cross-cultural initiative active since 2015. Since 2023, the program has focused on co-design efforts with youth in this neighborhood (Baca et al., 2024). During the first workshop together with the Campana-Altamira community conducted in Tecnológico de Monterrey, the focus remained largely instructional. The participating junior high school students (aged 13 to 15) were selected based on their prior affiliation or perceived behavior, meaning the activities did not fully reflect the broader community of youth in Campana-Altamira. To shift towards problem-solving, the workshop began with an exercise mapping how students mapped ways plastic waste was used in their daily lives.

A more meaningful co-design practice emerged when the students were invited to identify issues (such as trash, street lighting, and stray animals) and co-develop potential solutions with the team. Once the students began articulating their own perspectives and priorities, the ideas generated proved far more grounded and actionable than those developed in the previous workshops. Reflecting on this process, we noted how prevailing academic cultures often reinforce the belief that university participants are the “experts.” This assumption proved counterproductive when working in contexts like Campana-Altamira, where real understanding only began after genuine engagement with the local students. Once students were given space to lead, they demonstrated deep contextual knowledge and became active co-designers.



Fig. 1 - Co-Creation Workshop in Campana-Altamira. Source: Authors, 2024

4.2. Insights from a Social Worker

We conducted a two-hour interview with a local social worker, with over a decade of experience in the area, who supported our workshop in Campana-Altamira. He explained that efforts to support marginalized communities in Mexico often neglect the voices of those most affected. Government and institutional interventions tend to focus on development and modernization without involving residents, leading to the erosion of cultural roots and mutual support systems. He emphasized that the issue is not the intent to help, but the lack of humility and time invested in building genuine relationships. Many institutional projects fail because they rely on rigid, top-down frameworks that do not reflect the lived experiences of communities. Preventive and community-centered strategies—such as engaging youth through education, revitalizing public spaces, and fostering consistent, positive relationships with law enforcement—are more effective than punitive or reactive approaches. For him, co-design must empower local leadership, viewing residents as experts of their environment. He also emphasized that meaningful engagement is a two-way process: practitioners, too, are transformed by working with communities. Humility, reflexivity, and a willingness to listen are essential to fostering respectful and lasting collaboration.

4.3. Co-design in Kampung Gedong Pompa

The co-design workshops in Kampung Gedong Pompa (Fig. 2) engaged residents in reimagining a future orphanage and reflecting on their changing relationship with water—once central to their livelihoods, now seen as a threat. The workshops were co-led by one author of this paper alongside other researchers. The activities were divided into two main iterations. The first focused on creative ideation with teenagers and adults. Youth responded to the prompt, “If water were not dangerous, how would you imagine life?” by drawing floating homes and nostalgic scenes. Adults engaged in participatory mapping, tracing movements before and after the 2007 flood and imagining future routes. Adults and teenagers then collaborated to shape clay models that envisioned a flood-resilient village and orphanage.

The second phase of the workshop shifted focus to materials and shared knowledge. Residents exchanged experiences using reclaimed resources like wood and old fishing equipment, offering practical insights into their value and reuse. Discussions also touched on how digital tools and information flow through the community, revealing opportunities to connect local know-how with new technologies. Even under environmental strain and social uncertainty, these workshops showed that creative collaboration can flourish when built on trust and mutual respect. The orphanage became more than a building; it was imagined as a shared space for care, learning, and resilience, rooted in Kampung Gedong Pompa’s longstanding relationship with water.



Fig. 2 - Co-Creation Workshop in Kampung Gedong Pompa.
Source: Authors, 2025

4.4. Insights from Pak RT

The interview with *Pak RT* informed about complex dynamics between government messaging, urban development pressures, and community resilience. Potential eviction often circulates indirectly, through media or rumors, rather than through direct engagement with

residents. This mode of communication grows psychological uncertainty among residents, eroding trust and leaving them vulnerable to speculation and fear-driven decision-making. In response to these pressures, the community has sought to reclaim agency through initiatives such as cooperative land ownership and neighborhood self-management, in collaboration with advocacy groups. These grassroots efforts reflect a shift toward collective stewardship as a form of resistance against potential displacement. The theme of preserving *komunalitas* (communal life) emerges as central to the community's resilience. Reflecting on the co-design process, *Pak RT* revealed the community's mixed reactions. Hands-on, creative approach was appreciated by the residents. Some residents expressed that they had never experienced such activities before. Discussion-based activity received less enthusiasm. Residents also expressed desire to be involved in future iterations and to be kept informed about ongoing activities. They wanted to know when researchers would visit the area again and how that data would be used. As highlighted by *Pak RT*, the success of these workshops and future development efforts depends on their ability to engage with the community on their terms: acknowledging their aspirations while empowering them in designing their own environment.

5. DISCUSSIONS

Co-design is often treated as a one-size-fits-all method for working with marginalized communities, yet our findings show that even when two sites appear similar, each has different needs and experiences. Approaches that assume uniform needs overlook these differences and risk reinforcing outsider-led dynamics. Both communities' residents showed a strong desire to participate in shaping the interventions that affect their lives, and when they were meaningfully included, the outcomes felt more relevant and sustainable. Because knowledge is situated and contextual, any attempt to create a universal co-design framework is unrealistic; instead, future work should focus on context-specific strategies and adaptive practices tailored to each community's lived realities. Table 1 offers flexible recommendations, as starting points to be adapted with communities.

Tab. 1 - Indicative Outline of Co-Design Guidelines for University Social Service Programs

Guideline Area	Example Focus	Practical Steps / Activities
Preparation and Orientation	Training in participatory methods and local context	Pre-departure workshops on cultural humility Assign readings about local context
Building Trust	Respect local rhythms and leadership structures	Early informal visits to local leaders/ social workers. Observe first, act later
Valuing Local Knowledge	Use participatory tools to center community expertise	Photo walks & mapping sessions with residents, local tool demonstrations
Balancing Knowledge	Avoiding imposing hierarchies in exchanges	Use tools like "knowledge mapping" to visualize, spaces for both parties' critique
Co-Defining Goals	Collaboratively define success criteria and shared outcomes.	Use visual tools Co-create success metric checklist
Ethical Practice	Ensure transparency & consent	Build in regular feedback loop
Reflective Learning	Encourage structured student reflection	Weekly journals, post-activity reflections sessions with community members

6. CONCLUSIONS

This paper argues that co-design in marginalized slum communities is not only a methodological process but also a relational and epistemological one. Through comparative case studies in Campana-Altamira and Kampung Gedong Pompa, we learnt that even when contexts appear similar (such as informal urban settlements facing poverty and infrastructural neglect), specific social dynamics and local knowledge systems require tailored & adaptable approaches. Universal frameworks often overlook this complexity. Practitioners must learn to recognize which local insights should shape the process, while ensuring external expertise supports. Genuine co-design is built on shared power, co-defined goals, and acknowledgment of community members as knowledge holders. It requires long-term relationship building and a commitment to mutual learning for locally driven design processes. This study acknowledges its limitations, as the findings draw primarily from two interviews. Further research should explore how institutions can support adaptive collaboration over time, and how communities themselves define success. These insights can inform more ethical co-design practices in urban marginalized contexts.

ACKNOWLEDGEMENTS

We sincerely thank the communities of Campana-Altamira and Kampung Gedong Pompa, along with their members, for their generous participation in the co-design workshops and interviews, and for sharing their insights and experiences throughout this research.

BIBLIOGRAPHIC REFERENCES

- Aristi, S., & Putri, V. R. (2024). Social design education from students' perspectives: A retrospective collaborative autoethnography. In *Learning within, learning without: Modes of design enquiry* (Vol. 1, pp. 190–205). Further Reading Press.
- Astuti, M. C. M. P., Luru, M. N., & Ramadhani, A. (2024). The resilience level of Kampung Sekretaris as urban village in response to urban development in the surrounding area. *IOP Conference Series: Earth and Environmental Science*, 1351(1), 012021. <https://doi.org/10.1088/1755-1315/1351/1/012021>
- Baca, A. M., Nimi, H. M., Aristi, S. Chacón Quintero, J. C. (2024). PULI Program Tec de Monterrey-Chiba University 2023: Co-Designing a Cross-Cultural Educational Program for Social Good. In *IFE Conference Proceedings 2024*, Monterrey, Mexico. <https://doi.org/10.5281/zenodo.13764010>
- BeltránGrimm, S. (2023). No solamente ellos aprenden, aprendemos nosotros también: Latina mothers' experiences with codesign approaches in creating a math activity for their children. *Journal of Latinos and Education*, 23(3), 1089–1108. <https://doi.org/10.1080/15348431.2023.2252506>
- Centro CEMEX-Tec para el Desarrollo de Comunidades Sostenibles. (2021, May). *Monitoring study report: Campana-Altamira Polygon (Estudio de Monitoreo Polígono Campana-Altamira – Reporte de Resultados)*. Monterrey, Mexico.
- Colom, A. (2013, April 4). How to ... avoid pitfalls in participatory development. *The Guardian – Global Development Professionals Network*. <https://www.theguardian.com/global-development-professionals-network/2013/apr/04/how-to-design-participatory-projects>
- Crosby, A. (2019). Design activism in an Indonesian village. *Design Issues*, 35(3), 50–63. https://doi.org/10.1162/desi_a_00549
- González Sánchez, X. (2022). *Community participation & empowerment in informal settlement upgrading: A case study in Monterrey, Mexico* (MSc thesis, Delft University of Technology, Delft, The Netherlands). Faculty of Architecture and the Built Environment.
- Iniciativa Campana-Altamira. (n.d.). *Iniciativa Campana-Altamira*. Retrieved April 28, 2025, from <https://campanaaltamira.org>
- Parra, V. (2024). Transforming communities: The Campana-Altamira Initiative and social innovation in action. *Management Studies: International Journal of Administration*, 16, 209–217. <https://www.rcdalyc.org/journal/7198/719878994010/719878994010.pdf>
- Pearce, T., Maple, M., Shakeshaft, A., Wayland, S., & McKay, K. (2020). What is the co-creation of new knowledge? A content analysis and proposed definition for health interventions. *International Journal of Environmental Research and Public Health*, 17(7), 2229. <https://doi.org/10.3390/ijerph17072229>
- Sarasola Sánchez-Serrano, J. L., González González, J. M., & Roiz Vázquez, A. (2019). La importancia del trabajo social comunitario [The importance of community social work]. *Azarbe: Revista Internacional de Trabajo Social y Bienestar*, 8, 1–7. <https://doi.org/10.6018/azarbe.364411>

Setiawan, A., Dunn, N., & Cruickshank, L. (2018). The influence of collective culture on co-design practice in Indonesian cities: Case studies from Jakarta, Solo, and Malang. *The International Journal of Architectonic, Spatial, and Environmental Design*, 12(4), 25–35. <https://doi.org/10.18848/23251662/CGP/v12i04/25-35>

Sintomer, Y., Herzberg, C., & Röcke, A. (2008). Participatory budgeting in Europe: Potentials and challenges. *International Journal of Urban and Regional Research*, 32(1), 164–178. <https://doi.org/10.1111/j.1468-2427.2008.00777.x>

Triharini, M., Malasan, P. L., Puspita, A. A., & Taepoer, R. A. (2024). Ambivalent attitudes behind the design policy in Indonesia. *Jurnal Desain Indonesia*, 6(1), 49–61. <https://doi.org/10.52265/jdi.v6i1.380>

Udoewa, V. (2022). An introduction to radical participatory design: Decolonising participatory design processes. *Design Science*, 8, e31. <https://doi.org/10.1017/dsj.2022.24>

NOTES ABOUT AUTHORS

Savira Aristi

Savira Aristi is a doctoral student at Graduate School of Science and Engineering, System Planning Laboratory, Chiba University. Her research explores design-led social intervention, behavioral design, and AI-mediated community empowerment.

Daniel Aldrete Ondarza

Daniel Aldrete Ondarza is a mechanical engineer from Tecnológico de Monterrey, with experience in Continuous Improvement, Production Planning, and Production Engineering. His background spans automation machinery design, manufacturing optimization, and systems improvement.

Virliany Rizqia Putri

Virliany Rizqia Putri is a doctoral student at the Graduate School of Human and Socio-environmental Studies, Kanazawa University. Her current research interest lies in the co-production of community heritage and museums in localized contexts.

Hisa Martinez Nimi

Hisa Martinez Nimi is an Assistant Professor at the Faculty of Data Science at Chiba University. She has been awarded two Good Design Awards. Her teaching disciplines include Visual Communication Design, Data Visualization, and Design Thinking.

Kenta Ono

Kenta Ono is a Professor at the Faculty of Science and Engineering at Chiba University.

Reference According to APA Style, 7th edition:

Aristi, S., Aldrete Ondarza, D., Rizqia Putri, V., Martinez Nimi, H., & Ono, K. (2026). Bridging Epistemologies: Rethinking Co-Design Practice Rooted from Local Expertise in Marginalized Slum Communities of Indonesia and Mexico. *Convergências - Revista de Investigação e Ensino das Artes*, VOL XIX (37), 57-65. <https://doi.org/10.53681/c1514225187514391s.37.383>

