

Shared learning Collective Actions and Drawing in Architectural Education

As architectural challenges become socially and ecologically complex, education must foster collective thinking, presence, and action. This research argues that freehand drawing remains a primordial mode of communication, enabling students to externalize thought, engage with place and community, and reflect collectively. While digital transformations reshape architectural representation, the architect's role as facilitator requires renewed forms of direct and critical communication. The methodology combines theoretical insights from participatory and experiential pedagogies with an emphasis on being present in complex real-world contexts—from personal space to urban environments—where observation, movement, and embodied engagement mediate understanding. Learning dynamics integrate collaborative exercises, feedback, and shared representation, fostering negotiation, improvisation, and co-creation. These principles are

applied through teaching experiments at the Barcelona School of Architecture: first-year Drawing courses develop technical and narrative skills while fostering group dialogue; the Urban Notes elective emphasizes ethnography, mapping, and collective interpretation of neighborhoods; and the Ciudad & Infancias workshops engage students, children, and communities in tactical urban interventions. Findings show that drawing operates as a cognitive tool, a medium of dialogue, and a platform for collective reflection, linking imagination, perception, place, and social action. These hybrid approaches—combining individual skill development, collaboration, and real-world engagement—may foster empathetic, socially responsive architects.



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Keywords:
Collective Actions, collective drawing, collaborative architecture, urban co-creation

I. INTRODUCTION REDISCOVERING PRIMORDIAL COMMUNICATION IN ARCHITECTURAL EDUCATION

Architecture—particularly public architecture as a transformation of urban space—holds both the capacity and social responsibility to shape our environment. From the first line on paper, architectural projects involve decisions that transform the places we inhabit and influence everyday life. Freehand drawing, in particular, allows architects to explore ideas directly on the page and communicate spatial concepts intuitively. As Berger (2015) suggests, drawing is an act of attentive seeing through which perception and thought are developed simultaneously, rather than separated. This role of drawing as a cognitive and perceptual device is being reconfigured by digital developments (Kalay, 2004; Oxman, 2008; Burry, 2016), altering both the conception of architecture and its communication among the many actors involved in urban processes. This transformation has also been described as a shift in architectural practice. Scheer (2014) argues that digital simulation reconfigures how architectural ideas are formed, moving away from drawing as the main generative medium toward computational environments that increasingly structure design thinking. On the other hand, in public projects, where institutions, professionals, and citizens interact, representation also becomes a medium for coordination and negotiation, making alternative and accessible forms of communication essential. Increasingly complex public projects raise questions about the architect's role. Beyond directing, architects in democratic contexts must listen, organize, and collaborate within networks of municipalities, governments, associations, professionals, and citizens. Participatory planning, recognized since the 1970s (De Carlo, 1970), has evolved into interdisciplinary collaboration involving sociologists, landscape architects, ecologists, and engineers (Petrescu & Trogal, 2017).

Within such a context, can hand drawing still

operate as a fundamental tool for thinking about and acting upon the built environment? How does hand drawing function as a key tool for thinking and designing in architecture today, and how is its role changing in the current digital context, including the acceleration of design processes enabled by AI?

This paper provides evidence of its cognitive and communicative role in architectural thinking and practice. Freehand drawing remains central not only in individual creative processes but also in collaborative contexts, where architects must communicate spatial ideas among diverse actors. It provides a dialogue between hand and thought unmatched by digital renderings or AI-generated images. While digital technologies enable rapid development, experts in large public projects—such as Professor Joan Busquets—stress that hand drawing remains essential for intuitive exploration, especially in early design stages (Seve & Gilabert, 2023). It enables real-time thinking and supports shared conversations in which ideas evolve collectively, making drawing both a cognitive and communicative tool in collaborative practice.

The transformation of architectural representation through digital tools parallels the effects of text-based communication such as email or WhatsApp on interpersonal interaction. Messaging does not eliminate handwriting or conversation, yet digital exchanges often flatten nuance by removing tone, gesture, and context, increasing the risk of misinterpretation (Kruger et al., 2005). As Byung-Chul Han (2020) argues, digital culture fosters a “disappearance of rituals,” replacing embodied practices with fragmented interactions. Likewise, while digital tools accelerate architectural development, relying on them alone can oversimplify the embodied, spatial, and communicative dimensions essential to the discipline. Architecture is not merely visual simulation but the articulation of spatial ideas based on human experience. Phenomenology emphasizes it as an embodied experience; Architecture mediates between the

world and human perception through body, memory, and touch. However the privileging of visual or digital representation risks detaching design from its sensory and existential depth (Pallasmaa, 2012). Furthermore, architectural processes involve complex problems—political, social, or spatial—issues that have historically been addressed through in-person deliberation and negotiation. Face-to-face interaction enhances trust, cooperation, and reading of nonverbal cues (Pentland, 2012), and is an area where shared drawing may play an important role in fostering communication and collaboration. Studios may then balance personal drawing, collaboration, and digital tools, fostering spaces where ideas are explored, tested, and refined individually and collectively.

Architectural pedagogy may reconnect with embodied communication, with freehand drawing as a central medium when students understand its purpose. It externalizes thought in real time, enables shared reflection, and supports rapid feedback through both technical and communicative engagement. Drawing links hand and eye, memory and imagination, and reveals spatial relations often less accessible in digital tools (Pallasmaa & Garriga-Gimeno, 2025). While digital communication can reduce immediacy and mutual understanding (Kruger et al., 2005), shared drawing restores embodied exchange. Digital tools extend rather than replace traditional media (Manovich, 2013), reinforcing drawing's relevance. The hand mediates tacit and haptic knowledge (Pallasmaa, 2009), and material presence remains central to meaning (Zumthor, cited in Pallasmaa, 2009). Drawing thus operates as a generative process through which architectural ideas are formed and transformed (Robbins, 1994).

Our thesis argues that architectural education must reclaim its primordial mode of communication. This involves learning through the self—via freehand drawing—allowing students to develop internal dialogue and clarify intentions. Courses should also structure collaborative contexts that foster this fundamental communication, empha-

sizing networked problem-solving. In this framework, drawing becomes more than a tool; it mediates understanding, negotiates meaning, and generates shared comprehension. Drawing becomes a natural way to communicate spatial ideas whenever clarity, reflection, or collective understanding is needed. This paper examines collective dynamics, real-context learning, and communal knowledge construction to cultivate architects who communicate effectively and address complex social challenges with empathy and cooperation.

II. SHARED LEARNING METHODOLOGIES

Architectural education is often divided between intensive project-based studios and lecture-based transmission of theory and tools, frequently reproducing conservative studio conventions rather than engaging broader social and contextual realities (Till, 2012). Rethinking architecture in this context requires revisiting traditional pedagogical approaches. This paper argues that two interrelated spheres are central: the dynamics of the learning process and the real-world contexts—including everyday life and communities—with which students engage.

Learning Dynamics

Collaborative and participatory learning is common in early childhood education but is rarely applied at the university level. In architectural education, instructors often emphasize technical skills over collaboration, as they are primarily practitioners rather than trained educators. Insights from early childhood education and related pedagogical fields can help strengthen collaborative and problem-based learning in higher education. For example, in Austin's Butterfly, a 7 year old student named Austin improved his observational drawing of a butterfly through positively responding to in-class critique. His initial simple drawing was refined through multiple drafts and structured peer and teacher feedback, showing how guided critique fosters both skill and creativity.

(Berger, 2012).

When two students work together on the same sheet to construct a perspective, an "intermediate space" emerges—a shared cognitive environment where they communicate, negotiate horizon lines, proportions, and spatial relationships. Gestures, corrections, hesitations, and anticipations help develop skills difficult to achieve independently. However, when working alone, students may struggle with perspective rules, often addressed through repeated individual instruction. Learning is inherently social: higher cognitive functions first appear on the social plane before being internalized individually, emerging through dialogue, observation, guided mediation, and mutual support. This aligns with Vygotsky's notion of the Zone of Proximal Development, where learners accomplish tasks with guidance that they cannot yet perform alone (Vygotsky, 1978). Knowledge is constructed through dialogue and shared praxis (Freire, 1970).

The same principles extend to joint reflection, where discussion and critique allow ideas and understanding to develop collaboratively. Neuroscience shows that observing and interacting engages mirror neurons—neuronal systems that fire both when observing an action and when performing it—supporting learning through imitation and shared understanding of actions (Rizzolatti & Craighero, 2004). In architectural education, students benefit from observing and analyzing students' work, sharing and debating references, or watching the instructor draw live, forming a shared graphic culture where visual norms and collective understanding are negotiated. Collaborative problem-solving in small groups—such as planning a room or designing interventions—enhances coordination, creativity, and joint decision-making, supported by neural networks involved in social cognition and shared action. For example, in tactical urbanism exercises or studio projects, students designing mock-ups, planning pedestrian flows, or adapting structures, often reach solutions which are difficult to achieve in-

dividually. Completing these projects together creates a shared cognitive space where meaning is mediated and collectively constructed. Learning in groups strengthens the social dimension of education, fostering communities of shared knowledge (Wenger, 1998).

Collaborative creation follows principles of experiential, action-based learning, where students work together to produce texts, objects, or models (Freinet, 1964/1993; Dewey, 1938). In these exercises, the challenge itself acts as a pretext: students engage in meaningful tasks that naturally require skill acquisition through practice. For example, a group of three might transfer a full-scale representation of a room to another space, creating plans, sections, and elevations. Completing the task requires accurate drawing, careful measurement, and negotiation of proportions collaboratively, while integrating theoretical knowledge. Similarly, activities such as full-scale construction, exploring urban spaces, or designing furniture provide contexts in which students develop technical, perceptual, creative, and social skills simultaneously. Through sensory exploration and embodied action, these skills are acquired via direct, hands-on experience rather than instruction alone, consistent with approaches documented in Reggio Emilia pedagogy (Edwards, Gandini, & Forman, 2012) and historical experiential frameworks such as those articulated by Montessori (1949) and Steiner (1924).

Finally, improvisation, performative exercises, and disruptive presentation formats encourage embodied learning, risk-taking, and deep engagement. These strategies turn the classroom into a laboratory for experimentation and shared knowledge construction, where thinking, doing, and feeling are inseparable. From rearranging classroom furniture to experimenting in urban spaces, and from personal reflection to collective problem-solving, learning becomes a dynamic, spatial, and social process.

Real-world Contexts: From the Self to the Urban Environment

Learning in architecture and drawing shapes how students relate to space, influencing future design practices. Classrooms and urban environments become key learning sites. Flexible classrooms mix short lectures with group activities, involving students with the space around them. Rows of desks historically limited interaction [Oblinger, 2006], while reformers like Dewey (1916), Montessori (1912), and Freinet (1964) promoted experiential learning through movable furniture, group work, and workshops.

Learning often begins with the self—"my space," my body, my everyday environment—what Hall (1966) calls the "personal bubble," shaping comfort, perception, and interaction. Simple exercises, like measuring and drawing a chair using one's body as reference, let students engage with space at a personal scale. This awareness gradually expands to the classroom, the immediate environment, and eventually the city.

Following Jane Jacobs (1961), walking reveals urban activity, diversity, and social interactions. Initiatives like Jane's Walk, also known as exploratory routes, demonstrate participatory urban learning, letting participants explore neighborhoods and uncover strengths and weaknesses through shared perspectives.

In this sense, walking can also serve as a research and design tool. Careri (2002) describes it as an aesthetic and cognitive act in which the body, movement, and resulting representations—such as drawings or maps—trace and interpret spatial experience. His approach builds on psychogeography, developed by Debord (1955/2006), where the *dérive* is an exploratory drift through urban space guided by perception and emotional responses. Observations are later shared and collectively discussed, forming a broader understanding of the landscape [Careri, 2002; Debord, 2006]. Mapping can be understood broadly, not just as



Fig. 1 - Students draw a belvedere in Barcelona in Drawing II, exploring contour, abstraction, tone, texture, and wash techniques. Source: Bruno Seve.

producing plans or conventional spatial representations, but as a process that incorporates multiple perspectives and forms of recording, including photography, drawing, writing, and embodied experience. The body becomes a tool for perceiving and interpreting space. Anna Halprin highlights the body as a medium for learning, connecting movement, dance, and perception with critical and creative engagement. Through movement-based practices and scores (action-based instructions or scripts), individual spatial experiences can be recorded, shared, and collectively interpreted [Halprin, 1970, 1972]. From this perspective, the "personal bubble" expands outward, shaping broader interpretations of everyday life and urban realities that feed into collective maps. Students integrate multiple perspectives and experiences into shared knowledge, creating layered understandings of space. Projects like *Col·lectiu Punt 6* and *Iconoclasistas* integrate diverse perspectives through walking and collective cartography. [*Col·lectiu Punt 6*, 2017; *Iconoclasistas*, 2013]. These approaches suggest that learning to draw and represent space is not just a technical skill but also a way to engage with lived environments, allowing students to move from individual perception toward shared understandings of urban space, where being there—the direct, bodily experience of place—is key.

II. EXPERIMENTATIONS, COMMUNICATIONS, AND SHARED EXPRESSIONS

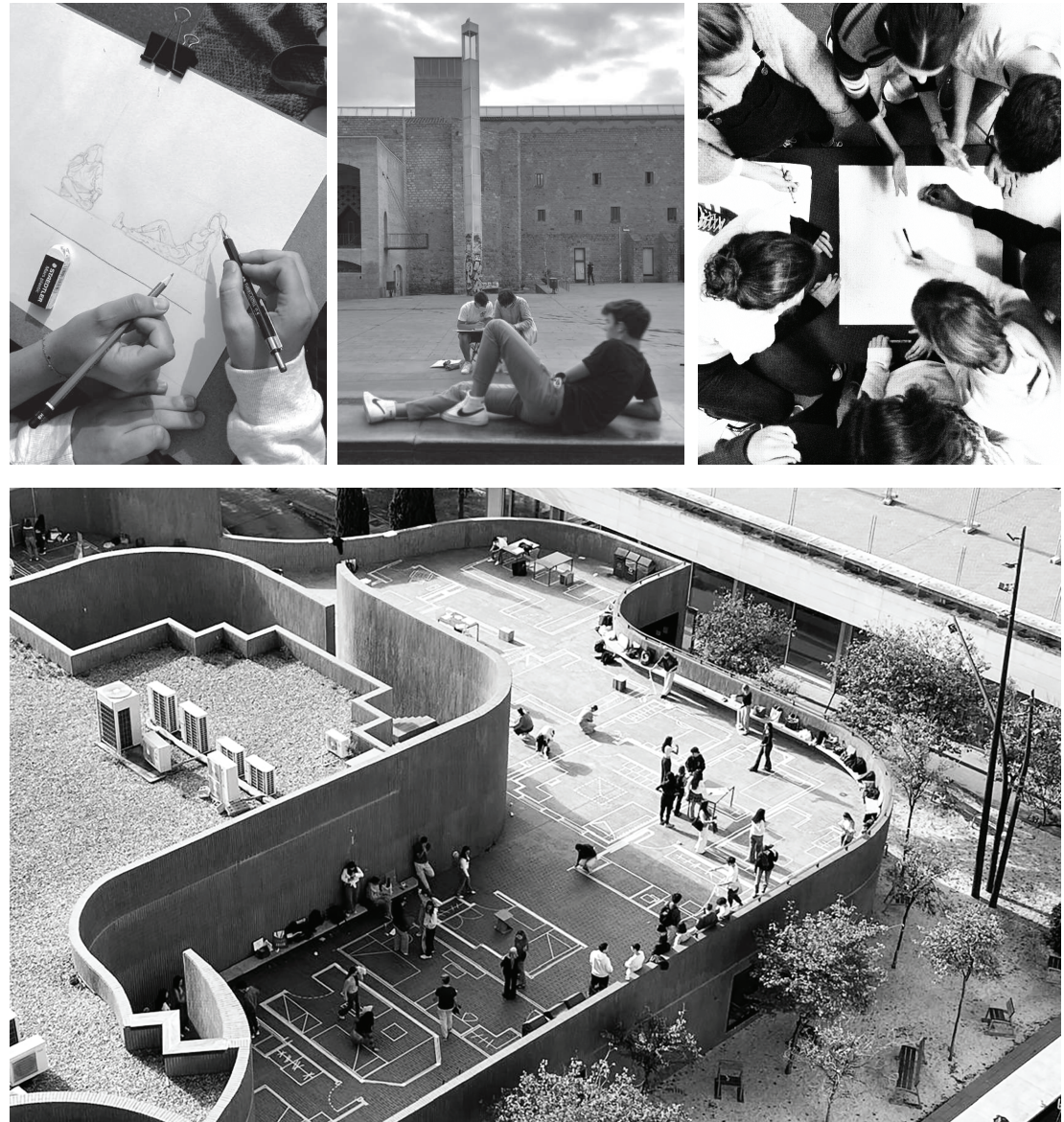
The central argument of this research—that drawing and its associated practices constitute a primary mode of communication—gains full significance when situated in the concrete practice of learning to observe, analyze, represent, and communicate potential transformations of existing realities in dialogue with communities. In architectural education, drawing serves not only as a representation tool but also as a method of inquiry, enabling students to critically engage with space and its social contexts. This process begins with individual perception and gradually expands toward collective, networked knowledge that integrates multiple perspectives. Its validity emerges through hands-on experimentation, where drawing acts simultaneously as an analytical instrument, a medium for dialogue, and a platform for shared reflection and collaborative interpretation. The following section revisits and analyzes, through the theoretical lenses discussed above, a series of pedagogical experiments at the Architectural school of Barcelona (ETSAB). It focuses on three complementary teaching experiences: first, the Architectural Drawing courses—Drawing I and II—for first-year undergraduates; second, *Urban Notes*, an elective primarily for third- and fourth-

year students; and third, the City & Childhood Urban Co-creation Workshops (Ciudad & Infancias), aimed at advanced and postgraduate students but open to a wider audience. Together, these experiences cover multiple stages of architectural education while employing a situated pedagogical approach directly within real urban contexts.

For this final section, it is important to note that data were gathered through structured feedback, open-ended conversations, and qualitative surveys including student reflections. In early undergraduate courses, not all learning is fully collaborative; some lecture-based components, like perspective instruction, remain necessary for foundational skills. Later workshops rely more on participatory dynamics, engaging students with communities, territories, and shared reflection. Drawing I & II. Initiatory Level. Cognitive and shared understanding

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In first-year Drawing I and II, students progress from studying the human figure and everyday objects to abstraction, from dihedral systems to complex perspectives and narrative representations, and from understanding space to interpreting place. The curriculum develops technical skills, spatial analysis, and visual synthesis while emphasizing experiential, collaborative learning through personalized guidance, group critiques, and shared reflection. Students engage directly with the environments they inhabit—the classroom, their homes, and the city—turning Barcelona into a living laboratory for observation and analysis. Open-ended exercises encourage individual and collaborative work through cycles of observation, design, experimentation, and reflection. By the hand of the year, students can represent simple architectural spaces in 2D and 3D,



Figs. 2–3. Mirror drawing and two- or three-handed sketches (Drawing I). Fig. 4. Collective map. Fig. 5. “Bringing the room to school” exercise (Drawing I). Sources: Bruno Seve; Pascual Bendicho and the authors.

apply graphic conventions, integrate the human figure for scale, situate the design, represent light, atmosphere, and materiality, and communicate ideas through sketches, narratives, and reasoned arguments. The pedagogy also develops transversal skills such as communication, teamwork, critical thinking, adaptability, and collaborative problem-solving.

A central challenge in first-year courses involves bringing the student's own room to the school and proposing a transformation using painter's tape, paper, and other materials. Groups first document the room's layout through sketches, then recreate it in the school. Students make decisions not only about line thickness, material representation, and spatial relationships, but also about mapping their space from their daily experience—combining technical and narrative skills. Working in groups of three, students communicate and collaborate while assimilating graphic conventions (plan, elevation, section) through playful, interactive activities. The project culminates in a final narrative of theatricalization, employing the body as an expressive tool.

Model-drawing sessions, mirror drawing, and two- or three-handed sketches, where multiple students work on the same sheet, allow simultaneous reproduction of objects or figures, fostering negotiation, discussion, and correction. This is particularly useful for fitting perspectives or measuring proportions, and it later supports independent drawing. Collaborative work also encourages peer guidance and mutual feedback.

Group critiques and public exhibitions reinforce this process, echoing the “Austin's Butterfly” experiment: drawings are displayed sequentially to promote collective observation and reflection. Instructors guide feedback without emphasizing individual mistakes, fostering shared progress,

emotional engagement, and motivation.

Once students master representation systems, the course promotes a shared graphic culture. Students select reference images and assemble a collective atlas organized by graphic strategies, encouraging discussion of techniques, styles, and visual narratives while strengthening collaborative learning, critical thinking, and communicative skills.

The findings indicate that drawing operates at two complementary levels in first-year education: as a cognitive tool to understand space and, when shared in groups, as a way to learn architectural fundamentals faster. Beyond representation, collaborative drawing shapes group dynamics and accelerates learning processes. When students draw together, they negotiate, verbalize, and adjust ideas in real time, combining perspectives into shared outcomes. Errors become productive, as discussing them enables rapid feedback, self-critique, and faster integration of theory into prac-

tice. This peer interaction, similar to the “Austin's Butterfly” model, fosters iterative improvement through collective reflection. Shared drawing also builds a graphic culture in which images and references circulate and evolve into new collective outputs.

Urban Notes. Advanced narratives Collective interpretation of place

In Urban Notes, drawing functions as a perceptual and social tool. Students focus on a neighborhood, combining sketching, ethnography, interviews, and participatory mapping through walks and co-creation sessions. Drawing becomes a medium for recording both spatial conditions and lived experiences, later translated into collective cartographies inspired by Careri's Walkscapes, Jane's Walk, and the Debord's dérive. These processes shift drawing from observation to collective interpretation of place, enabling dialogue, negotiation, and the co-construction of situated urban knowledge between students and residents.



Fig 6,7 Urban Notes in El Raval. Photographs by Dr. Aubrey Toldi, an expert in collective cartography, produced during her doctoral research stay at ETSAB. Courtesy of Aubrey Toldi.



Fig 8,9,10. Urban Notes in El Raval. Photographs by Dr. Aubrey Toldi, an expert in collective cartography, produced during her doctoral research stay at ETSAB. Courtesy of Aubrey Toldi.

City & Childhood.Urban Co-Creation Workshops. Social Negotiation and Co-Production

Ciudad & Infancias are biannual urban co-creation workshops developed with ETSAB, TEC Monterrey, and FADU-UABJO in Oaxaca, with local partners and experts in collaborative, violence-sensitive design. The 20-day program follows a community-centered approach where design emerges from local needs through co-diagnosis, tactical urbanism and collective interventions (co-design). Students and local actors work with children, families, and schools to reimagine public space in contexts of violence, producing layouts, murals, and installations.

Drawing plays a central role throughout the workshops, operating as both a research instrument and a shared language. Initially, it captures children's urban perceptions—expressing fears, desires, and everyday experiences—while serving as a tool for ethnographic recording. As the process moves into co-design, drawing becomes an active medium of negotiation; sketches, plans, and participatory maps are continuously redrawn and discussed with the community in real time. This active drafting makes local knowledge visible and guides collective decision-making. Ultimately, the drawing translates dialogue into physical action, whether through co-designed murals or spontaneous sketching directly onto walls and

improvised surfaces during the building process. One key moment occurs when children are invited to draw their perceptions of public space at different times of the day. These drawings are later translated into collective perceptual cartographies that reveal recurring concerns, especially around school arrival and departure times and areas perceived as unsafe. Beyond identifying problems, these maps also expose latent spatial desires, such as the need for shade, seating, or lighting in previously unprogrammed spaces. These insights directly inform tactical urbanism interventions, transforming school thresholds into social spaces through the co-construction of benches, shaded structures, and lighting systems, all developed from the shared reading of drawings and maps produced with children. These results show that drawing functions as both a representational tool and a medium for social negotiation and collective action. Its adaptability enables real-time shared decision-making, making drawing a platform for dialogue, trust, and co-production. In the Ciudad & Infancias workshops, it engages face-to-face, embodied interaction, supporting empathy and horizontal communication in contrast to digitally mediated exchanges, which reduce expressive richness and lived complexity. Ideas are negotiated through active presence, where drawing, making, and conversing blend to reactivate a form of collective engagement—resonating with Byung-Chul Han's (2020) critique of how shared rituals disappear in digital culture.

IV. DISCUSSION

These pedagogical experiments demonstrate that drawing, when used in collaborative settings, operates as a shared cognitive tool rather than a mere representational skill. Across the three educational settings, drawing consistently functions as an intermediate space where thinking is externalized, negotiated, and refined through interaction. Learning emerges not from individual production alone, but from continuous cycles of observation, correction, and dialogue, where ideas are tested and adjusted in real time. In this context, drawing reorganizes the relation between perception, knowledge, and action. Within first-year studios, it supports shared graphic reasoning to help students assimilate architectural fundamentals faster. In Urban Notes, it enables situated narratives and dialogues, while in Ciudad & Infancias, it serves as a medium for social negotiation and community co-production. Across all cases, drawing shifts from mere representation to an active mode of communication. These processes reveal that learning to draw is also learning to listen, respond, and construct meaning collectively. The "intermediate or shared space" produced through shared drawing is not only cognitive but also social, requiring attention to others' perspectives, negotiation, and mutual adjustment. In this sense, drawing functions as a relational practice structuring knowledge production and collective responsibility.

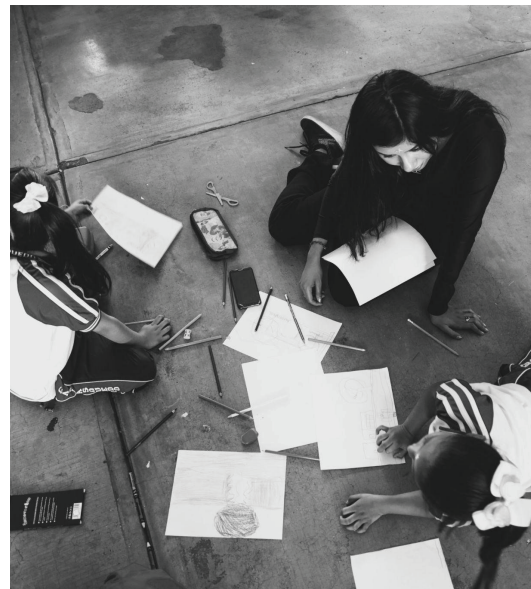


Fig. 11. Jane's Walk during the 2025 workshop. Fig. 12. Route sketches and documentation. First workshops recorded community needs with children and caregivers. Figs. 14–15. Tactical COB designs, in-situ drawings, and community mixing processes. Fig. 16. Finished COB benches. Sources: Ángeles Espitia; Bruno Seve; Aurelio Ninandii Antonio Cruz (ANAC).



Educational context	Role of drawing	Main outcome
Drawing I & II	Shared drawing for mediation and feedback	Faster shared understanding
Urban Notes	Collective mapping and interpretation	Production of situated narratives and collective cartographies
Ciudad & Infancias	Co-design and negotiation tool	Community-led interventions

Table 1.
Role of hand drawing and main results in relation to its educational context.

V. CONCLUSION

This paper argues that hand drawing is not a secondary representational technique but a foundational mode of architectural cognition and collaboration. Across different pedagogical formats, it enables movement between perception, interpretation, and action, linking individual experience and collective understanding.

Rather than separating thinking, making, and communicating, hand drawing integrates them into a continuous process. It operates as a tool for shared understanding in situations of complexity, uncertainty, and negotiation. Its pedagogical value lies not only in technical proficiency, but in cultivating attention, empathy, and collective intelligence in architectural practice.

While digital tools extend representation and production, they do not replace the embodied, dialogic, and situated qualities of freehand drawing in early and collaborative stages. Drawing remains

essential as a medium through which knowledge is not only represented, but collectively produced. As digital technologies increasingly dominate design processes, the embodied and collaborative power of freehand drawing is becoming increasingly vital to bridge the gap between digital outputs and social realities.

Ultimately, these findings reposition drawing as a vital pedagogical and social instrument—one that embeds architectural education within lived urban realities and aligns it with collective processes of spatial production, negotiation, and transformation.

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