

Introducing Architecture to Early Childhood through Play-Based Community Service at a Bandar Lampung Kindergarten

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Abstract

Early childhood education in Indonesia remains oriented toward basic literacy and numeracy, while learning about space, form, and the built environment is rarely introduced, even though spatial ability develops rapidly and is highly malleable at a young age. This community service program addressed that gap by introducing basic architectural concepts to kindergarten children through a one-day, play-based workshop at TK Negeri 2 Bandar Lampung. Involving five lecturers and twelve architecture students, the program used visual media, drawing, shape puzzles, cardboard model-making, and an environmental “little architect” role-play, with achievement assessed through a three-indicator facilitator observation rubric (conceptual understanding, creativity, and engagement). Facilitator observation indicated a marked increase in children’s recognition of basic building shapes and functions and in their enthusiasm for design-related play, suggesting that early, playful exposure to architectural thinking is feasible and worth institutionalizing in kindergarten curricula.

Keywords: architectural education, early childhood, play-based learning, spatial awareness, community service

1. INTRODUCTION

Early childhood is a period of rapid cognitive and sensory development, during which children begin to recognise shape, colour, and their surrounding environment mainly through direct experience and play (Berkowitz et al., 2021). Spatial ability, understood as the capacity to visualise, manipulate, and reason about spatial relationships, is not fixed at birth; it develops progressively and is particularly responsive to stimulation and practice during the early years, making childhood a strategic window for spatially oriented learning that later underpins design. Engineering, and problem-solving competence (Berkowitz et al., 2021).

Despite this, learning at the kindergarten level in Indonesia continues to emphasise basic literacy and numeracy, while education about space, built form, and the environment is only rarely introduced (Paryoko, 2020; Tri Suci et al., 2017). Architecture is, in fact, inseparable from children’s daily lives: room comfort, lighting, color, and the spatial layout of a building directly shape how children move, play, and learn (Sari, 2004; Tri Suci et al., 2017). Early childhood education and care settings are themselves recognised as an influential “third teacher”, where the physical environment actively participates in shaping children’s development, well-being, and sense of belonging (Economidou et al., 2023). If children are never invited to notice or question that environment, an important avenue for nurturing spatial thinking, creativity, and environmental awareness remains unused.

Introducing basic architectural concepts from an early age can help children understand space, train spatial thinking, strengthen creativity, and build awareness of a healthy and sustainable built environment (Bunawardi et al., 2023). It can also stimulate critical thinking and problem-solving through age-appropriate, interactive methods such as drawing, colouring, singing, and role-play as a “little architect”, allowing children to grasp, in simple terms, how buildings and cities are formed. This is consistent with contemporary early-childhood pedagogy, which positions play

not as a distraction from learning but as its primary vehicle: structured, intentional play develops children's cognitive flexibility, problem-solving, and creative capacity while keeping them motivated and engaged (Parker et al., 2022; Garaigordobil, 2022).

TK Negeri 2 Bandar Lampung, located in Sukaramé, approximately 3 kilometres (around six to eight minutes by car) from Institut Teknologi Sumatera (ITERA), was selected as the community partner for this program. As a public kindergarten serving children aged four to six years, the school had not previously received any structured introduction to architecture or the built environment in its curriculum, despite operating in immediate proximity to a higher-education institution with relevant expertise. This situation illustrates a common condition among public kindergartens in the Bandar Lampung area: proximity to academic resources does not automatically translate into curriculum enrichment unless deliberately bridged through community engagement.

Based on this situation analysis, the priority problems addressed by this community service program were formulated as follows: (1) how basic architectural concepts can be introduced to early childhood learners through an enjoyable method; (2) what benefits architecture education offers for increasing children's creativity and environmental awareness; and (3) how interaction between children and their environment can be built through space-based activities. Accordingly, the objectives of this activity were to introduce basic concepts of architecture (form, space, and colour) to kindergarten children, to develop their creativity through interactive, architecture-based activities, and to raise their awareness of the importance of space and environment in daily life.

This article reports the design, implementation, and outcomes of that program as a form of research-based community service (Research-through-Design in miniature), in which the Architecture Study Program's pedagogical and design expertise was translated into a developmentally appropriate learning experience for young children, while simultaneously generating field evidence on the feasibility of early architectural literacy in the Indonesian kindergarten context.

2. METHODOLOGY

This community service activity was designed as a participatory, play-based educational intervention rather than an experimental study, in line with common practice in service-learning programs that introduce technical disciplines to young children through informal, activity-based pedagogy. The program was carried out under the Mandiri (self-funded) Community Service Scheme of Institut Teknologi Sumatera, formalised through Assignment Letter No. 1035/IT9.2.1/PM.01/2025 and a partnership statement from TK Negeri 2 Bandar Lampung (Statement No. 421.1/25/IV.40/TKN.2/04/2025), and implemented over the period of 15 April to 15 July 2025, with the core activity day held on 23 May 2025 at the partner school.

Partner and Participants

The community partner was TK Negeri 2 Bandar Lampung, a public kindergarten under the Bandar Lampung City Education and Culture Office, located on Jalan Letkol H. Endro Suratmin, Sukaramé, approximately 3 km from ITERA. The target participants were early childhood learners aged 4-6 years enrolled at the school [the exact number of participating children was not recorded in the source administrative documentation and should be confirmed by the author team from the attendance/observation sheets before submission]. The facilitation team consisted of 5 lecturers of the Architecture Study Program, ITERA, and 12 undergraduate Architecture students, giving a facilitator-to-child ratio that allowed close, small-group guidance during hands-on tasks.

Materials and Media

Learning media were developed to match the cognitive and attention characteristics of 4-6-year-olds: illustrated picture cards of building forms and colours; simple worksheets for shape-matching and drawing a "dream house"; and

low-cost, safe construction materials (cardboard, ice-cream sticks, paper, glue, scissors, and crayons) for building miniature house models. All presentation materials used simple vocabulary, bright colours, and a consistent mascot-style visual identity ("Aku Arsitek Kecil"/"I Am a Little Architect") to sustain engagement across sessions.

Implementation Procedure

The activity was carried out in five sequential stages, illustrated in Figure 1.

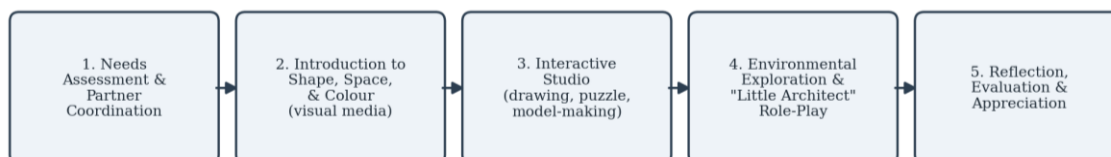


Figure 1. Five-stage implementation flow of the community service activity

Stage 1, Needs Assessment and Partner Coordination, involved communication with the school's principal regarding licensing, schedule, classroom space, and logistical needs. Stage 2, Introduction to Shape, Space, and Colour, delivered simple material on basic building forms and architectural colours using visual media and a short interactive presentation. Stage 3, Interactive Studio, engaged children in drawing their dream house, completing a building-shape puzzle, and constructing a simple house model from cardboard and ice-cream sticks, developing fine motor skills alongside spatial imagination. Stage 4, Environmental Exploration and "Little Architect" Role-Play, invited children to observe the forms of buildings around them and role-play as small-scale architects designing their own dream house. Stage 5, Reflection, Evaluation, and Appreciation, closed the activity with a light discussion of what the children had learned and small rewards to appreciate their work and sustain motivation.

Measurable Indicators and Evaluation Method

Because standardised, validated instruments for architectural literacy in early childhood are not yet available in the Indonesian context, program success was measured descriptively through a structured facilitator observation rubric covering three indicators: (1) Conceptual understanding - the child's ability to recognise basic parts of a building (roof, wall, foundation) and relate them to their function; (2) Creativity and imagination - the child's ability to independently design or build a dream house through drawing or a cardboard model; and (3) Engagement and spatial curiosity - the child's active participation in environmental observation and role-play as a "little architect". Each indicator was rated by two facilitators per small group on a three-level scale (Achieved/Emerging/Not Yet Visible), based on direct observation during Stages 2-4 and a review of the children's drawings and models at Stage 5, with an informal oral check at the start of Stage 2 (baseline) compared against task completion at the end of Stage 4 (endline) to approximate a pre- and post-activity comparison. This observation-based approach follows common practice in similar service-learning and early-childhood intervention reports, where quantifiable but non-experimental indicators (percentage of children rated as achieving a skill or attitude change) are used in place of formal statistical testing (see also Parker et al., 2022, on assessment approaches for play-based learning).

3. RESULTS AND DISCUSSION

The program "Introduction to the World of Architecture for Early Childhood" was implemented smoothly at TK Negeri 2 Bandar Lampung and produced generally positive outcomes. Facilitators used a combination of visual illustration, hands-on model-making, and drawing/labelling to help children recognise basic architectural elements. Three media proved particularly effective in practice: (a) illustrated pictures of building forms as an initial introduction to the variety of building shapes; (b) cardboard-and-paper miniature model-making, which trained fine motor skills

while sharpening children's imagination of building form; and (c) drawing and colouring a child's-eye-view "house", which served as a mode of visual expression and understanding of the built environment.

Achievement of Learning Indicators

Table 2. Summary of the facilitators' observation-based rating of the three measurable indicators, comparing the informal baseline check at the start of the session with the endline observation at its conclusion.

Indicator	Baseline (%)	Endline (%)	Facilitator Observation Notes
Conceptual understanding (naming building parts and functions)	~30-35	~80-85	Most children could name and explain roof, wall, and foundation by the end of the session.
Creativity and imagination (drawing/building own dream house)	~35-40	~85-90	Original cardboard models and drawings with recognisable architectural features were produced by most children.
Engagement and spatial curiosity (participation in exploration and role-play)	~50-55	~90-95	Children were highly active and enthusiastic, especially in the environmental exploration and role-play stage.

Across all three indicators, children's post-activity performance was rated substantially higher than their baseline. Most children, who initially could not name the basic parts of a house beyond "roof" and "door", were able by the end of the session to identify roof, wall, and foundation and to associate each with a simple function (sheltering, enclosing, and supporting, respectively) - closely mirroring the descriptive song used in Stage 2 of the activity. In the creativity indicator, children who began the session hesitant to draw or unsure how to start a model were, by Stage 4, able to complete an original cardboard house model or a dream-house drawing with recognisable architectural features (roof shape, windows, door placement, and colour choices). Engagement was rated highest overall: children were observed to be active, enthusiastic, and willing to participate in every session, including the more physically exploratory environmental-observation and role-play stage.

Documentation of Activities



Figure 2. Children presenting their self-made cardboard house models



Figure 3. A facilitator guiding a child through a shape-matching and drawing worksheet

Discussion

These results are consistent with the theoretical proposition that spatial ability is highly malleable in early childhood and can be actively cultivated through targeted, hands-on experience rather than left to develop passively (Berkowitz et al., 2021). By deliberately engaging children with shape, model-making, and environmental observation, this program operationalised, at a small scale, the kind of built-environment stimulation that Economidou et al. (2023) argue is central to a supportive early-childhood setting: children were positioned not merely as occupants of a designed space but as active interpreters and "designers" of it. The strong engagement observed in Stages 3 and 4 also corroborates the broader literature on play-based learning, which finds that intentional, guided play increases children's motivation, creative output, and willingness to take on open-ended tasks compared with purely instructional formats (Parker et al., 2022; Garaigordobil, 2022).

Within the Indonesian architecture-education literature, this program can be read as a practical response to repeated calls for architecture and design disciplines to engage more directly with early-childhood facility design and pedagogy (Paryoko, 2020; Tri Suci et al., 2017; Bunawardi et al., 2023). Where those studies largely examine the physical design of child-friendly educational facilities, the present activity complements them by demonstrating that architecture as a discipline can also directly deliver content to children, not only shape the buildings they occupy. This dual role, designing for children and teaching with children, illustrates an underused extension of the Architecture Study Program's community-service mandate and aligns with recent design-education work showing that creative, sensory-rich learning spaces and activities support children's spatial and imaginative development (Aliefia et al., 2024).

Several external strengths supported the program's success: strong cooperation from the school's principal and teachers in providing schedule, classroom space, and logistical support; a favourable facilitator-to-child ratio (12 students and 5 lecturers) that enabled close small-group guidance; and the proximity of the partner school to ITERA, which minimised travel burden and allowed multiple site visits during preparation. At the same time, several limitations should be acknowledged. First, the program was implemented in a single one-day session, which limits the durability of the observed gains and precludes any claim about long-term retention of the concepts introduced. Second, the evaluation relied on a non-validated, facilitator-administered observation rubric rather than a standardised instrument, so the reported achievement levels should be interpreted as indicative rather than precise measurements; a structured, piloted instrument would strengthen future iterations. Third, the modest self-funded budget (IDR 2,000,000) constrained the range and durability of materials that could be provided to each child, and limited the program to a single partner school rather than a comparative multi-site design. Fourth, as is common in early-childhood community engagement, formal parental/guardian consent for the publication of children's photographs should be explicitly documented and referenced if activity documentation is to be included in the final published article.

These limitations point to clear directions for future development: (1) designing the activity as a multi-session module (e.g., a 3-4 week "Aku Arsitek Kecil" curriculum) rather than a single day, to allow observation of retention and skill consolidation over time; (2) developing and piloting a simple, age-appropriate pre-/post-assessment instrument specific to early architectural literacy, in collaboration with early-childhood education specialists; (3) formalising a reusable teaching module and facilitator guide so that the program can be replicated at other kindergartens in the Bandar Lampung area with minimal additional cost; and (4) exploring closer integration with the kindergarten's existing thematic curriculum, so that architecture-related content becomes a recurring rather than one-off enrichment activity.

4. CONCLUSION

This community service program successfully introduced basic architectural concepts, shape, space, and colour, to early childhood learners at TK Negeri 2 Bandar Lampung through a play-based, one-day workshop combining visual media, drawing, model-making, and environmental role-play. Facilitator observation indicated a clear improvement, from baseline to endline, in children's conceptual understanding of basic building elements, their creative expression in designing and building simple house models, and their overall engagement and curiosity toward the built environment. The main obstacles encountered were the single-session format, the absence of a validated measurement instrument, and a limited budget that constrained scale and material variety. To sustain and strengthen this initiative, the author team recommends transforming the activity into a multi-session, replicable curriculum module, developing a piloted assessment instrument, and pursuing broader partnerships with other kindergartens and early-childhood education stakeholders in the region.

5. ACKNOWLEDGMENTS

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