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Glocalizing Philosophy for Children (P4C): Embodied Cognitive Processes in a Culturally Embedded Kinesthetic Routine for Early Childhood

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Abstract. This study examines how a culturally familiar kinesthetic routine, Senam Anak Ayam, facilitates the emergence of early cognitive processes specifically predictive reasoning, symbolic evaluation, and spontaneous self-monitoring among preschool children. Using an exploratory qualitative design, the research involved 18 children aged 4–6 years in Indonesian preschool setting, at Banyumas Regency, Banjarnegara Regency, Cilacap Regency in Central Java, Indonesia. Data were collected through high-resolution video recordings, verbatim interaction transcripts, and teacher reflective notes. Micro-interaction analysis was employed to segment events, code recurrent behaviors, and compare patterns across three sessions. The findings show that children consistently displayed anticipatory movements aligned with rhythmic cues, indicating early predictive reasoning. They also engaged in gesture-based symbolic negotiation as they evaluated the appropriateness of movements representing a chick's behavior. Additionally, several children produced spontaneous self-monitoring comments, demonstrating emergent metacognitive awareness during a non-instructional activity. These results suggest that culturally embedded embodied routines can serve as low-pressure cognitive affordances that support foundational thinking skills in early childhood. The study contributes to embodied cognition literature by highlighting how everyday movement activities provide opportunities for inquiry, reflection, and meaning-making without formal instruction. Conclusions emphasize the need for further longitudinal and comparative research to clarify underlying mechanisms and strengthen theoretical generalizability.

Keywords: Embodied Cognition; Senam Anak Ayam, Early Childhood; Predictive Reasoning; Metacognition

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INTRODUCTION

Global scholarship on early childhood education increasingly recognizes that young children possess rich capacities for reasoning, interpretation, and self-regulation when learning environments invite them to reflect, anticipate, and make meaning through varied modalities of engagement (Murris, 2022; Sawyer, 2023). Empirical research has shown that preschool-aged children can articulate justifications, make predictions, negotiate perspectives, and monitor their own actions under conditions that support exploratory learning and cognitive autonomy (Fisher et al., 2022). As a result, contemporary early childhood frameworks emphasize the importance of nurturing early reasoning and emergent metacognition, moving beyond narrow developmental models that portray young children as primarily concrete and pre-reflective thinkers.

Yet the pedagogical conditions necessary for cultivating such early reasoning remain unevenly implemented across global contexts. In many early childhood systems, including those in majority-world nations such as Indonesia, classrooms continue to be characterized by highly scripted instruction, limited dialogic interaction, and an overreliance on decontextualized materials that do not meaningfully connect with children lived experiences (Walsh et al., 2021; Han, 2023). These conditions constrain opportunities for children to engage in the kinds of reflective, symbolic, and self-regulatory thinking that contemporary developmental research identifies as foundational for later academic and socio-emotional learning. The gap between curricular aspirations and classroom realities highlights a broader challenge: pedagogical models imported from Western contexts often fail to resonate with local cultural practices, creating a mismatch between children's cultural repertoires and the cognitive demands placed upon them.

Philosophy for Children (P4C), developed by Matthew Lipman, has emerged as one of the most widely researched approaches for cultivating early reasoning, argumentation, and collaborative inquiry (García-Moriyón et al., 2020; Gorard et al., 2021). Its emphasis on dialogic engagement and shared meaning-making aligns with contemporary understandings of children as competent thinkers. Studies in early years settings show that P4C can enhance metacognitive awareness, conceptual reasoning, and perspective-taking even among preschool children (Daniel & Auriac, 2021). However, scholars of P4C increasingly argue that its effectiveness is culturally contingent; children reason more readily when stimuli and inquiry prompts are grounded in familiar cultural practices, symbols, and embodied experiences (Haynes & Murris, 2022; Trickey, 2023). Without such grounding, inquiry risks becoming abstract and disconnected from children's sense of identity and embodied knowledge.

Parallel to this, research in embodied cognition has transformed understandings of early thinking, demonstrating that reasoning emerges through children's bodily actions, rhythmic participation, gesture-based interpretation, and culturally patterned modes of engagement (Chandrasegaran, 2023; Kim & Park, 2020). Embodied cognition theories argue that young children do not simply think with their minds but also with their bodies, drawing on movement, rhythm, and sensory experience as central pathways to understanding. Studies using micro-interaction analysis have shown that children's anticipatory movements, gesture adjustments, and self-corrections reveal cognitive processes often overlooked when researchers focus solely on verbal expression (Liu & Lee, 2023; Wu et al., 2022). Yet, most of this research has examined structured

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interventions designed by adults. Little is known about how *naturally occurring*, *culturally embedded* movement routines as those reflected by children participation as part of local play culture, that can foster early reasoning in everyday educational settings.

This gap is particularly salient in Indonesia, where children's daily lives are rich with culturally meaningful kinesthetic routines such as *Senam Anak Ayam*. Despite their ubiquity, such routines are often treated merely as warm-up activities or transitional breaks rather than as cognitively rich opportunities for reasoning, symbolic negotiation, and self-monitoring. No empirical research to date has examined how these familiar embodied practices might function as cognitive affordances within glocalized adaptations of P4C or early childhood inquiry. This represents a significant oversight, as culturally meaningful routines may offer developmentally appropriate and low-pressure spaces where children can naturally engage in reflective and interpretive thinking, particularly before they are developmentally ready for sustained verbal philosophical dialogue.

Responding to these gaps, the present study explores how young children engage in cognitive processes during *Senam Anak Ayam*, a culturally familiar kinesthetic routine widely practiced in Indonesian preschools. Using micro-interaction analysis, the study investigates how children's anticipatory gestures, symbolic interpretations, and spontaneous self-monitoring emerge organically within this routine. Rather than imposing external activities or structured pedagogical frameworks, the study examines how reasoning develops *through* everyday cultural practices, offering a qualitative account of how embodied routines can support glocalized P4C and culturally responsive early childhood pedagogy.

By situating *Senam Anak Ayam* within broader theoretical and pedagogical conversations on embodied cognition and culturally grounded inquiry, this research seeks to demonstrate that early reasoning does not solely arise from formal instruction or structured philosophical dialogue. Instead, it can emerge through culturally resonant embodied engagement that aligns with children lived experiences. This study therefore contributes to the growing recognition that culturally embedded movement routines can serve as natural laboratories for the development of early reasoning, offering a bridge between global pedagogical aspirations and local cultural practices.

METODE

This study employed an exploratory qualitative design to capture the subtle and situated ways in which young children engaged in cognitive processes during a familiar kinesthetic routine. Because the central focus was the unfolding of meaning in naturally occurring interactions, the methodological approach was grounded in principles of naturalistic inquiry, privileging ecological validity, thick description, and close attention to the contextualized nature of children's embodied engagements. The design aligned with qualitative traditions that view children's actions, gestures, and verbalizations not merely as behavioral outputs but as meaningful expressions shaped by cultural, social, and situational contexts.

1. Research Context and Participants

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The study was conducted in a community-based preschool in Banyumas Regency, Banjarnegara Regency, and Cilacap Regency, Central Java Province, Indonesia, where *Senam Anak Ayam* is routinely practiced as part of daily learning activities. Eighteen children aged 4–6 years participated, recruited through purposive sampling to ensure typical developmental functioning and familiarity with the routine. The sample was not intended to represent broader populations statistically; rather, it provided an information-rich context for observing meaning-making within an activity deeply rooted in local children's culture. Parental consent and institutional approval were secured, and ethical considerations followed standards for early childhood qualitative research, including attention to power, privacy, and child comfort.

2. Data Collection Procedures

To capture the multi-layered nature of children's embodied reasoning, data were collected through three complementary sources:
(1) Video recordings, enabling fine-grained observation of micro-gestures, gaze patterns, bodily adjustments, and anticipatory movements;
(2) Verbatim transcripts, which included children's speech, vocal expressions, and teacher comments annotated with movement descriptions; and
(3) Teacher reflective notes, providing contextual insights regarding interpersonal dynamics, engagement levels, and classroom norms.

Data were collected across three sessions of approximately 20 minutes each, ensuring repeated observation of the same routine to identify consistencies and variations in cognitive behaviors. The video-based approach was critical for qualitative rigor, as children's reasoning often manifested in fleeting, non-verbal actions not easily captured through fieldnotes alone.

3. Analytical Approach

Data were analyzed using micro-interaction analysis, an approach derived from ethnomethodology and conversation analysis but adapted here to foreground embodied cognition. The analysis proceeded iteratively through several stages. First, each session was segmented into discrete episodes based on shifts in rhythm, collective transitions, or notable peer interactions. Second, these episodes were reviewed repeatedly to trace patterns of anticipatory movement, symbolic interpretation, self-correction, and selective imitation. Coding categories were informed by both prior literature (e.g., Chandrasegaran, 2023; Liu & Lee, 2023; O'Dea et al., 2022) and inductive patterns emerging from the data, allowing for analytical flexibility while maintaining theoretical grounding.

Rather than quantifying behaviors, the analysis sought to interpret how children's gestures and utterances reflected underlying cognitive processes within a culturally meaningful context. The aim was to understand *how* children constructed meaning through the routine, not to generalize prevalence. Interpretive memos were written throughout the process, documenting analytic decisions and emerging themes, which contributed to auditability and analytic transparency.

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4. Ensuring Qualitative Rigor

Multiple strategies were employed to enhance the trustworthiness of the findings. Credibility was supported through prolonged engagement across three sessions, enabling the identification of recurring interactional patterns rather than isolated incidents. Triangulation across video recordings, transcripts, and teacher reflections strengthened interpretive confidence by revealing convergence across data sources. Additionally, a second researcher independently reviewed coded segments, achieving 85% inter-coder agreement before the final thematic consolidation. While qualitative rigor does not rely on statistical indices, the agreement served to ensure that core interpretations were not idiosyncratic to a single analyst.

Dependability was supported through comprehensive documentation of analytic procedures, including coding frameworks, episode segmentation criteria, and analytic memos. These materials allow for the procedural traceability expected in rigorous qualitative studies. Confirmability was addressed through reflexive dialogue between researchers, in which alternative interpretations were discussed, and analytic assumptions were explicitly questioned. This reflexive stance helped minimize the influence of researcher expectations on the interpretation of children's actions.

Transferability, understood as the applicability of insights to similar contexts, was enabled through thick description of the research setting, cultural relevance of the routine, and detailed accounts of children's embodied behaviors. Although generalization in the statistical sense was not the goal, the described processes may inform educators and researchers working in similar cultural and pedagogical environments, particularly those seeking to integrate embodied learning or glocalized P4C into early childhood classrooms.

5. Researcher Reflexivity

The interpretive stance used in this study acknowledges that children's reasoning cannot be separated from the cultural and embodied contexts in which it is enacted. The researchers approached the data not as detached coders but as reflective interpreters attentive to the multiplicity of meanings that children's gestures, anticipations, and self-corrections might carry. This reflexive approach aligns with qualitative traditions emphasizing researcher positionality as a resource rather than a liability, enriching the depth and cultural sensitivity of the analysis.

RESULTS AND DISCUSSION

The analysis of the three *Senam Anak Ayam* sessions revealed that children's embodied participation generated a multilayered field of cognitive processes strongly shaped by the cultural familiarity of the routine. Because the study relied on triangulated qualitative data which including video recordings, transcripts, and teacher reflections, the first step in establishing analytic rigor is to ground the findings transparently in the data itself.

Table 1 summarizes the data sources, their duration, and their analytic value, showing how each contributed to the interpretive depth of this study. As noted by Chandrasegaran (2023), qualitative studies of embodied cognition require multimodal data to capture subtleties that are often absent in verbal transcription alone.

Table 1. Data sources, duration, analytic value.

Data Source	Description	Duration & Quantity	Analytic Contribution
Video Recordings	Two-angle high-resolution recordings of *Senam Anak Ayam* sessions	3 sessions × 20 minutes = 60 minutes total	Enabled micro-analysis of anticipatory gestures, gaze shifts, movement corrections, and peer interactions (Chandrasegaran, 2023).
Transcripts	Verbatim transcripts of children's speech, non-verbal cues, and movement annotations	37 transcript pages	Provided linguistic markers of predictive reasoning, symbolic evaluation, and self-monitoring (Fisher et al., 2022).
Teacher Reflective Notes	Teacher observations recorded after each session	3 written reflections	Offered contextual insights into engagement, cultural familiarity, and comfort levels (Han, 2023).

The first emergent pattern in the data was the prevalence of predictive reasoning, visible in how children anticipated rhythmic changes and movement sequences before they occurred. This was consistently observed across episodes and supported both by direct speech and embodied timing. To illustrate this analytically, Table 2 presents selected transcript excerpts with timestamps showing how predictive utterances and movement anticipations unfolded moment-by-moment. These excerpts serve as raw qualitative anchors, grounding the analytic claims that follows the approach aligned with the recommendations of Liu and Lee (2023) for preserving micro-interaction integrity in embodied studies.

Table 2. Selected transcript

Episode & Timestamp	Actor	Transcript Excerpt	Noted Behavior
Ep04–00:21	Child 3	"Cepetan, nanti habis ini cepat!"	Predictive reasoning: anticipating tempo change (O'Dea et al., 2022).
Ep05–00:18	Child 7	"Sayapnya jangan tinggi, anak ayam	Symbolic evaluation based on ecological knowledge (Wu et al.,

		kecil."	2022).
Ep09–00:27	Child 11	"Aduh salah aku… ulang dulu."	Self-monitoring in a low-pressure environment (Sawyer, 2023).
Ep14–00:41	Child 5	"Mau cepat nih!"	Anticipation of impending rhythm change.
Teacher Note	Teacher	"Anak-anak langsung bergerak sebelum musik, seperti sudah hafal ritmenya."	Cultural immediacy (Haynes & Murris, 2022).

Predictive Reasoning as Embodied Anticipation

Qualitative examination of these excerpts indicates that children exhibited rapid, unprompted anticipatory gestures, often preceding musical cues by seconds. For example, during Episode 14, a child verbalized *"Habis ini cepat!"* (Ep14–00:41), demonstrating temporal forecasting rooted in embodied memory. This supports the argument by Kim and Park (2020) that rhythmic entrainment in early childhood is not merely a motor activity but a cognitive process involving internal prediction models.

Teacher notes echoed this observation, describing how "anak-anak langsung bergerak sebelum musik," reinforcing that these anticipatory shifts were not isolated events but part of a broader embodied schema the children shared (Han, 2023).

To formalize this analytic process, Table 3 outlines the coding framework used to interpret these behaviors into higher-order cognitive categories that can be considered as an essential step in establishing dependability and confirmability in qualitative work.

Table 3 outlines the coding framework.

Cognitive Process	Definition	Indicators	Example Excerpt	Supporting Literature
Predictive Reasoning	Anticipation of future movement or rhythm	Pre-cue movement, verbal forecasting	"Habis ini cepat!" (Child, Ep14)	Kim & Park (2020); O'Dea et al. (2022)
Symbolic Evaluation	Judging representational accuracy	Peer correction, symbolic adjustment	"Anak ayam nggak setinggi itu." (Ep11)	Wu et al. (2022); Fisher et al. (2022)

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Self-Monitoring	Recognizing one's errors	Self-correction	"Salah aku…" (Ep09)	Murris (2022); Sawyer (2023)
Selective Imitation	Refining action via peer reference	Brief alignment with peer	Child adjusts wing angle in Ep04	Chandrasegaran (2023)
Cultural Immediacy	Immediate enactment of familiar movement	Moving before cue	Teacher note	Han (2023)

Symbolic Evaluation as Negotiated Embodied Meaning

Children also frequently engaged in symbolic evaluation, correcting peers' movements based on shared ecological knowledge. In Episode 05, for example, Child 7 told a peer, *"Sayapnya jangan tinggi, anak ayam kecil,"* asserting a culturally grounded standard of accuracy. This aligns with Fisher et al. (2022), who argue that symbolic reasoning often emerges in embodied form before it can be articulated abstractly.

Symbolic evaluation also appeared through non-verbal channels. In Episode 11, observation notes indicated that a child silently lowered her arm position after glancing at another peer's gesture—a subtle but meaningful calibration illustrating selective imitation (Chandrasegaran, 2023). These forms of embodied negotiation reflect early reasoning processes often overlooked in traditional cognitive assessments (Wu et al., 2022).

To synthesize these findings into analytic categories, Table 4 provides a thematic summary that bridges raw observation and theoretical interpretation.

Table 4. Thematic summary

Theme	Empirical Manifestation	Interpretation
Temporal Anticipation	Pre-cue movement, forecasting	Embodied schema supports early reasoning (Kim & Park, 2020).
Symbolic Negotiation	Peer corrections	Meaning-making grounded in cultural ecology (Haynes & Murris, 2022).
Embodied Metacognition	Self-correction	Low-pressure reflection (Murris, 2022).
Social Alignment	Selective imitation	Distributed cognition (Liu & Lee, 2023).

Self-Monitoring and Metacognitive Emergence

The presence of spontaneous self-corrections such as *"Aduh salah aku… ulang dulu"* (Ep09–00:27) demonstrates that metacognitive awareness emerged naturally during movement without teacher prompting. This supports findings by Sawyer (2023) suggesting that metacognition flourishes in low-pressure, culturally familiar environments.

Pedagogical and P4C Implications

The connection between these embodied findings and early philosophical inquiry becomes clear when the data is positioned alongside P4C scholarship. Table 5 illustrates how each cognitive process observed in *Senam Anak Ayam* aligns with key P4C competencies such as anticipation, evaluation, and reflection (García-Moriyón et al., 2020).

Table 5. Cognitive process observed

Empirical Finding	Pedagogical Significance	Relevance to P4C
Predictive reasoning	Supports rhythm, patterning	Anticipating conversational turns (Daniel & Auriac, 2021).
Symbolic evaluation	Concept negotiation	Early representational reasoning (Trickey, 2023).
Self-monitoring	Reflective habits	Metacognitive dialogue foundation (García-Moriyón et al., 2020).
Cultural immediacy	Engagement, comfort	Cultural accessibility of inquiry (Han, 2023).

CONCLUSION

The findings of this qualitative study demonstrate that *Senam Anak Ayam*, a culturally familiar kinesthetic routine, serves as a powerful cognitive and pedagogical affordance for young children's reasoning, reflection, and meaning-making. By integrating video-based micro-interaction analysis, verbatim transcript excerpts, and teacher reflective notes (Table 1), the study revealed how children's cognitive processes emerged naturally within embodied participation rather than through adult-directed instruction. The children's anticipatory movements, symbolic adjustments, and spontaneous self-corrections as it is documented in the transcript excerpts in Table 2 provide clear empirical evidence that

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early reasoning is rooted in embodied and culturally grounded practices rather than purely verbal or abstract tasks.

Through a rigorous coding framework (Table 3), three core cognitive processes were identified: predictive reasoning, symbolic evaluation, and self-monitoring. These processes not only appeared frequently across episodes but also manifested with remarkable consistency, suggesting that the embodied and rhythmic nature of the routine supported children's ability to anticipate, evaluate, and reflect. The emergent themes summarized in Table 4 shows the temporal anticipation, symbolic negotiation, embodied metacognition, and social alignment has also highlighted how children coordinated bodily gestures with cultural imagery and peer interactions, echoing claims in embodied cognition literature that meaning-making in early childhood arises through multimodal and culturally situated participation (Kim & Park, 2020; Chandrasegaran, 2023; Liu & Lee, 2023).

Importantly, the study shows that these embodied cognitive processes align closely with foundational competencies of Philosophy for Children (P4C), including prediction, conceptual evaluation, and reflective awareness. The connections outlined in Table 5 illustrate how *Senam Anak Ayam* functions as a developmentally appropriate and culturally resonant entry point into early philosophical thinking. Children were already engaging in moves central to philosophical inquiry: anticipating consequences, refining representations, negotiating shared meaning, and monitoring their own reasoning through expressed movement, gesture, and brief verbal utterances such as *"Habis ini cepat!"* and *"Salah aku…"*. These embodied expressions challenge the assumption that philosophical reasoning must begin with verbal dialogue and instead affirm that reasoning often emerges first in bodily form, particularly in early childhood (Haynes & Murris, 2022; Daniel & Auriac, 2021).

The study contributes a culturally grounded perspective to the literature on embodied cognition and early childhood inquiry by documenting a routine that is locally emergent rather than imported or artificially structured. This addresses an identified gap in previous research, which has largely focused on adult-designed motor-intervention programs rather than the pedagogical affordances of children's own cultural practices (Fisher et al., 2022; O'Dea et al., 2022). In demonstrating that cognitive richness arises during *Senam Anak Ayam*, the study underscores the importance of glocalizing early inquiry pedagogies particularly as P4C, so that they reflect and honor children lived cultural worlds. Such

alignment strengthens engagement, fosters comfort, and positions learning as an extension of children's everyday embodied experiences rather than a departure from them.

At a practical level, the findings encourage teachers to reconceptualize movement routines not as breaks from learning but as integral sites of cognitive development. Recognizing the potential of culturally embedded routines allows educators to support reasoning, representation, and reflection in ways that feel natural and joyful to children. This has implications not only for classroom practice but also for curriculum design, teacher training, and early childhood policy, particularly in majority-world contexts seeking pedagogical models that are both developmentally appropriate and culturally sustaining.

While the study's scope was limited to a single preschool and three observation sessions, its qualitative depth provides a strong foundation for future research. Longitudinal observations could further explore how repeated engagement with embodied routines strengthens children's metacognitive habits, while cross-cultural studies could investigate whether similar patterns emerge in other traditional kinesthetic activities. Additionally, integrating movement-based inquiry with formal P4C sessions may reveal how embodied reasoning transitions into verbal philosophical dialogue over time.

In conclusion, this study demonstrates that *Senam Anak Ayam* is far more than a playful routine, but also it is a culturally embedded cognitive environment where children anticipate, evaluate, and reflect through their bodies. These findings expand current understandings of early childhood cognition by showing that philosophical thinking begins not only in dialogue, far beyond that also built in the rhythmic, symbolic, and socially negotiated movements of children's everyday cultural practices. By foregrounding these embodied forms of reasoning, educators and researchers can better honor the ways young children naturally think, learn, and make meaning in the world.

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