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RESEARCH ARTICLE

Sigeh Pengunten Dance: Deep Learning Effects on Motor and Cognitive Skills

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Kata Kunci:
Pembelajaran Mendalam, Keterampilan Motorik, Keterampilan Kognitif, Tari Sigeh Pengunten, Pendidikan Seni

Abstrak

Pendidikan tari di Indonesia menghadapi tantangan yang terus-menerus dalam mengembangkan kompetensi motorik dan kognitif siswa secara bersamaan melalui pendekatan pembelajaran konvensional berbasis imitasi. Penelitian ini meneliti dampak pedagogi pembelajaran mendalam terhadap keterampilan motorik dan kognitif siswa dalam mempelajari Sigeh Pengunten, tarian penyambutan tradisional masyarakat Lampung. Dengan menggunakan desain kuasi-eksperimen yang dilengkapi komponen observasional, penelitian ini melibatkan 30 siswa kelas 10 di SMA Yadika Bandar Lampung sebagai peserta. Desain pre-test dan post-test diterapkan selama intervensi pembelajaran mendalam delapan minggu yang terdiri dari empat tahap pedagogis: aktivasi dan kontekstualisasi, eksplorasi konsep, praktik berwujud, dan refleksi metakognitif. Hasilnya menunjukkan peningkatan yang signifikan baik pada keterampilan motorik (rata-rata skor meningkat dari 65,3 menjadi 82,6, kenaikan 26,5%) maupun keterampilan kognitif (dari 63,7 menjadi 84,1, kenaikan 32,0%), dengan signifikansi statistik $p < 0,001$. Korelasi yang kuat antara hasil tes motorik dan kognitif ($r = 0,73$) menegaskan bahwa kompetensi ini berkembang secara saling bergantung di bawah pengajaran deep learning. Temuan ini memberikan dukungan berbasis bukti untuk mengintegrasikan pendekatan deep learning ke dalam pendidikan seni tradisional di tingkat sekolah menengah di Indonesia, dengan implikasi untuk pengembangan kurikulum, praktik pengajaran, dan pelestarian warisan budaya.

Key Word:
Deep Learning, Motor Skills, Cognitive Skills, Sigeh Pengunten Dance, Arts Education

Abstract

Dance education in Indonesia faces persistent challenges in simultaneously developing students' motor and cognitive competencies through conventional, imitation-based instructional approaches. This study examines the impact of deep learning pedagogy on students' motor and cognitive skills in learning Sigeh Pengunten, a traditional ceremonial welcoming dance of the Lampung people. Employing a quasi-experimental design with embedded observational components, the research involved 30 Grade 10 students at SMA Yadika Bandar Lampung as participants. A pre-test and post-test design was implemented over an eight-week deep learning intervention comprising four pedagogical phases: activation and contextualization, conceptual exploration, embodied practice, and metacognitive reflection. Results demonstrated significant improvements in both motor skills (mean score increase from 65.3 to 82.6, a gain of 26.5%) and cognitive skills (from 63.7 to 84.1, a gain of 32.0%), with statistical significance at $p < 0.001$. The strong correlation between motor and cognitive post-test outcomes ($r = 0.73$) confirms that these competencies develop interdependently under deep learning pedagogy. These findings provide evidence-based support for integrating deep learning approaches into traditional arts education at the secondary school level in Indonesia, with implications for curriculum development, pedagogical practice, and cultural heritage transmission.

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PENDAHULUAN

The teaching and learning of traditional dance in Indonesian secondary education occupies a complex intersection between cultural preservation, artistic development, and contemporary pedagogical demands. While dance education is formally embedded within the Seni Budaya curriculum as mandated by the national curriculum framework, its implementation in classrooms frequently defaults to imitative, repetition-based instruction in which students mechanically replicate movement sequences without developing meaningful conceptual understanding of the cultural, aesthetic, or kinesthetic dimensions of the art form (Hidayat, 2022; Murgiyanto, 2019). This surface-level engagement characterized by procedural memorization rather than reflective understanding limits not only students' artistic growth but also undermines the broader educational goals of cultivating critical thinking, cultural appreciation, and embodied self-expression. The challenge is

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not incidental but systemic: prevailing assessment formats, time constraints, and limited teacher professional development in reflective pedagogy collectively reproduce surface learning as the path of least resistance in arts classrooms across Indonesia.

Sigeh Pengunten is one of the most iconic traditional dances of Lampung province in southern Sumatra, Indonesia. Traditionally performed as a ceremonial welcoming dance (tari penyambutan) in formal and official events, Sigeh Pengunten encapsulates the values of hospitality, respect, and cultural identity central to the Lampung people (Firmansyah & Oktavia, 2021). The dance is characterized by its precise and graceful hand and arm movements (gerak sembah), intricate footwork (selang jalan), and formal attire reflecting the nobility of Lampung adat culture. As a regional cultural heritage of recognized significance, Sigeh Pengunten has been incorporated into secondary school arts curricula across Lampung, including at SMA Yadika Bandar Lampung. However, incorporation into the curriculum does not guarantee meaningful engagement: the dance can be taught and frequently is in ways that reduce its rich cultural vocabulary to a series of reproducible surface gestures, severed from the meanings and values they embody.

Preliminary observations conducted at SMA Yadika Bandar Lampung prior to this study revealed that dance instruction in Grade 10 consistently relied on demonstration-and-imitation methods that privileged surface learning over deep engagement. Students were routinely assessed on their ability to reproduce movement sequences in isolation, without adequate opportunities to understand the contextual meaning, historical background, or embodied logic of each gesture. This pedagogical approach, which Marton and Saljö (1976) famously identified as a "surface approach to learning," produces fragile and context-dependent competencies that do not transfer well to authentic performance situations or reflective understanding. When students were informally questioned about the significance of the movements they practiced, the majority could not articulate why specific gestures were performed in particular ways, confirming the absence of conceptual engagement that observation alone suggested.

Deep learning, as a pedagogical construct distinct from the computational machine-learning technique of the same name, refers to an approach in which learners engage with content at a level of meaning-making, conceptual integration, and reflective understanding (Biggs, 1987; Entwistle, 2009). Learners who adopt a deep approach seek to understand ideas for themselves, relate new knowledge to existing experience and prior knowledge, and examine arguments critically rather than accept them passively. In contrast to the surface learner who treats content as discrete items to be memorized and reproduced, the deep learner constructs an understanding of the principles, structures, and meanings that underlie surface information. Applied to dance education, deep learning pedagogy entails guiding students not merely to replicate movement but to understand why each gesture exists, what cultural logic underpins the choreographic structure, how technical precision relates to aesthetic expression, and how individual physical capacities can be intentionally engaged to produce meaningful performance.

The theoretical foundations of this study draw upon three intersecting bodies of scholarly literature. First, Marton and Saljö's (1976) foundational distinction between surface and deep approaches to learning established the conceptual basis for examining how qualitative differences in learning engagement produce qualitatively different learning outcomes. Biggs and Tang (2011) extended this framework through the concept of constructive alignment, arguing that the quality of learning outcomes depends critically on how teaching activities and assessment tasks are designed to elicit deep rather than surface cognitive engagement. Second, motor learning theory particularly the stage-based model proposed by Fitts and Posner (1967) illuminates the developmental trajectory through which learners move from effortful, cognitively demanding movement execution (cognitive stage) to increasingly automatic, fluent performance (autonomous stage). The transition between these stages is mediated not merely by repetition but by the quality of attention, feedback, and conceptual understanding that accompany practice (Schmidt & Lee, 2011). Third, the revised taxonomy of educational objectives (Anderson & Krathwohl, 2001) provides an organizing framework for assessing the cognitive dimension of dance learning, from basic recall of movement names and cultural terminology through analysis of aesthetic structures, evaluation of performance quality, and synthesis of personal interpretation.

Previous research has examined the relationship between pedagogical approach and learning outcomes in arts education, though empirical studies specifically addressing deep learning pedagogy in traditional dance contexts remain limited. In the context of music education, Miksza and Tan (2015) found that students who employed deep learning strategies including metacognitive monitoring, interleaving, and conceptual mapping demonstrated significantly greater musical understanding and performance quality than those relying on rote repetition. Hetland et al. (2013), in their influential Studio Thinking framework, documented that high-quality arts education develops "habits of mind" including observation, reflection, and exploration,

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which correspond closely to the cognitive processes activated by deep learning approaches. In Indonesian arts education specifically, research by Jazuli (2016) identified a persistent tendency toward surface learning in secondary school dance classes, attributing this pattern to time constraints, limited teacher training in reflective pedagogy, and assessment formats that reward technical compliance over conceptual understanding. Internationally, Oreck (2018) demonstrated that integrating culturally responsive pedagogy into dance instruction a strategy closely aligned with deep learning principles produced significant improvements in both technical competency and cultural awareness among secondary school students learning traditional dances.

A critical research gap exists in the literature: no empirical study has specifically examined the effects of a systematically implemented deep learning pedagogical intervention on both motor and cognitive skill development in the context of Sigeh Pengunten dance, or indeed within any Indonesian traditional dance taught at the secondary level. Most existing studies treat motor and cognitive learning as parallel but independent dimensions, whereas the embodied nature of dance education demands an integrative analysis of how conceptual understanding and physical skill mutually reinforce each other. Furthermore, the Lampung cultural context remains underrepresented in Indonesian arts education research more broadly, creating a regional equity gap in the evidence base available to teachers and policymakers. This study addresses these gaps by providing empirical evidence for the dual impact of deep learning pedagogy on students' motor and cognitive competencies in Sigeh Pengunten dance learning, while simultaneously contributing to the cultural-pedagogical literature on Lampung traditional arts.

The novelty of this research lies in three dimensions: first, it is among the first studies to apply a systematic and structured deep learning pedagogical intervention to traditional Lampung dance education; second, it employs a dual-measurement design that captures motor and cognitive outcomes simultaneously, enabling analysis of their interrelationship under a single pedagogical treatment; and third, it contributes a practically grounded and replicable pedagogical model applicable to secondary arts education in Indonesia, where research-informed practice remains underdeveloped relative to other curriculum areas.

This study aims to: (1) analyze the influence of deep learning pedagogy on the motor skills of Grade 10 students in learning Sigeh Pengunten dance at SMA Yadika Bandar Lampung; (2) analyze the influence of deep learning pedagogy on the cognitive skills of the same students; and (3) measure the overall improvement in students' competency in Sigeh Pengunten dance as a result of the deep learning intervention.

METODE PENELITIAN

This study employed a quasi-experimental research design with an embedded systematic observational component, situated within the methodological tradition of educational research in the arts and humanities. Quasi-experimental designs are appropriate when random assignment of participants to conditions is not feasible due to the practical and ethical constraints of naturally occurring school settings (Creswell & Creswell, 2018). Specifically, this study utilized a one-group pretest-posttest design, in which all participants underwent the deep learning pedagogical intervention and were assessed at both baseline and endpoint using validated instruments. This design was selected in preference to a no-treatment control condition on ethical grounds: denying a potentially superior pedagogical approach to a control group during a compulsory curriculum unit would be inconsistent with the duty of care owed to all students.

The study was conducted at SMA Yadika Bandar Lampung during the 2024–2025 academic year, spanning eight weeks corresponding to the Seni Budaya (Arts and Culture) curriculum unit on regional traditional dance in Grade 10. Participants consisted of 30 students (15 female, 15 male; aged 15–16 years) selected through purposive sampling from one intact Grade 10 class, based on their enrollment in the compulsory arts education program and absence of prior formalized traditional dance training beyond standard primary and junior secondary school exposure.

The deep learning intervention was structured across eight two-hour weekly sessions, each comprising four sequential pedagogical phases consistent with Biggs and Tang's (2011) constructively aligned teaching model. Phase 1 (Activation and Contextualization) introduced students to the cultural, historical, and symbolic background of each Sigeh Pengunten movement motif through teacher narration, video documentation, and structured question- and-answer discussions. Phase 2 (Conceptual Exploration) guided students through analytical engagement with movement structure via peer discussion, written movement notation, and comparison with video recordings of expert performances. Phase 3 (Embodied Practice) engaged students in deliberate, reflective movement practice with continuous formative feedback from the teacher and peer observers, emphasizing intentional rather than mechanical repetition. Phase 4 (Metacognitive Reflection) required students to articulate their understanding of movement meanings,

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identify areas of strength and difficulty, and set personal improvement goals through structured journaling and group discussion. Each session systematically engaged students at multiple cognitive levels, from cultural knowledge recall to aesthetic analysis and creative self-evaluation (Anderson & Krathwohl, 2001).

Motor skill assessment employed a validated performance checklist developed through consultation with two expert traditional dance educators and one arts education researcher. The checklist evaluated five sub-dimensions: (1) gerak sembah precision, (2) footwork coordination (selang jalan), (3) body posture and alignment (sikap badan), (4) movement flow and smoothness (alur gerak), and (5) spatial awareness and formation (pola lantai), each scored on a 0–10 scale to yield a composite motor skills score out of 100. Cognitive skill assessment combined written tests (addressing cultural knowledge, movement vocabulary, and analytical reasoning) with oral reflective tasks (requiring evaluation and self-assessment), scored on a parallel 100-point scale. Inter-rater reliability between two independent assessors was established at $r = 0.87$ for motor skill assessments and $r = 0.84$ for cognitive assessments prior to formal data collection, indicating satisfactory reliability (Sugiyono, 2017).

Observational data were collected using the validated checklist during both the pre-test, formative sessions, and post-test phases, supplementing quantitative assessment scores with qualitative evidence of student engagement and competency development. Students' reflective journals were analyzed using thematic coding to identify patterns of understanding, difficulty, and growth across the intervention period. Quantitative data were analyzed using paired-sample t-tests to determine the statistical significance of pre-post differences, with an alpha level set at 0.05. Bivariate correlational analysis was employed to examine the relationship between motor and cognitive post-test outcomes. Triangulation of quantitative assessment data, systematic observational notes, and student reflective journal content was used to strengthen the validity and trustworthiness of the study's findings (Creswell & Creswell, 2018).

HASIL DAN PEMBAHASAN

Before the implementation of the deep learning intervention, baseline assessments were conducted to establish students' initial competency levels in both motor and cognitive dimensions of Sigeh Pengunten dance. Pre-test motor skill scores ranged from 52 to 78, with a mean of 65.3 (SD = 6.82), indicating a moderate-to-low proficiency level consistent with limited prior exposure to formalized traditional dance instruction. Cognitive skill pre-test scores ranged from 50 to 77, with a mean of 63.7 (SD = 7.14), reflecting similarly limited baseline understanding of the cultural, historical, and aesthetic dimensions of Sigeh Pengunten. These results are presented in Table 1.

Table 1. Pre-test and Post-test Descriptive Statistics for Motor and Cognitive Skills (N = 30)

Variable	Pre-test M (SD)	Post-test M (SD)	Mean Gain	% Improvement
Motor Skills	65.3 (6.82)	82.6 (5.94)	17.3	26.5%
Cognitive Skills	63.7 (7.14)	84.1 (5.68)	20.4	32.0%

Source: Fitri, R. et al. (2026)

Structured observation conducted during the pre-test phase corroborated these quantitative findings. Most students demonstrated difficulty in executing the gerak sembah with appropriate wrist rotation and controlled finger extension, a technically demanding gesture that requires both fine motor precision and conceptual understanding of the gesture's symbolic meaning as an expression of reverence and welcome. Footwork sequences showed frequent hesitation and asynchrony between upper and lower body movements, suggesting inadequate internalization of the movement logic governing transitions between motifs. Performance of the pola lantai (spatial formation patterns) was particularly inconsistent, with many students losing formation awareness when simultaneously attending to movement execution demands for a clear manifestation of the cognitive overload characteristic of Fitts and Posner's (1967) cognitive stage of motor learning. Importantly, when students were asked during observational assessment to explain the meaning of specific movements, the majority provided superficial or incorrect responses, confirming limited cognitive engagement with the dance's cultural content at baseline.

Following eight weeks of systematic deep learning intervention, significant improvements were recorded across all assessed dimensions of both motor and cognitive skill. Motor skill post-test scores ranged from 70 to 96, with a mean of 82.6 (SD = 5.94), representing a mean gain of 17.3 points and a 26.5% improvement from baseline. Cognitive skill post-test scores ranged from 72 to 96, with a mean of 84.1 (SD = 5.63), representing a mean gain of 20.4 points and a 32.0% improvement from baseline. Paired-sample t-tests confirmed that the improvements in both motor skills ($t(29) = 12.84$, $p < 0.001$) and cognitive skills ($t(29) = 14.37$, $p < 0.001$) were statistically highly significant, as presented in Table 2.

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Table 2. Paired Sample t-Test Results for Motor and Cognitive Skill Improvement (N = 30)

Variable	t	df	p-value	Result
Motor Skills	12.84	29	< 0.001	Significant (p < 0.05)
Cognitive Skills	14.57	29	< 0.001	Significant (p < 0.05)

Source: Fitri, R. et al. (2026)

A finer-grained analysis of motor skill development across the five assessed sub-dimensions, presented in Table 3, reveals differentiated patterns of improvement that are theoretically informative. The greatest relative gain was recorded in spatial awareness and formation (pola lantai), which improved from a mean sub-score of 6.1 to 8.7 (a 42.6% gain), followed by gerak sembah precision (31.3% gain). The smallest relative gain was observed in body posture and alignment (25.8%), a sub-dimension that involves deeply habituated postural patterns that may require longer intervention periods to transform substantially.

Table 3. Motor Skill Sub-dimension Pre-test and Post-test Scores (Scores out of 10, N = 30)

Motor Skill Sub-dimension	Pre-test M	Post-test M	Gain	% Gain
Gerak sembah precision	6.4	8.4	2.0	31.3%
Footwork coordination (sekang jalan)	6.5	8.3	1.8	27.7%
Body posture & alignment (sikap badan)	6.6	8.3	1.7	25.8%
Movement flow & smoothness (alur gerak)	6.3	8.2	1.9	30.2%
Spatial awareness & formation (pola lantai)	6.1	8.7	2.6	42.6%

Source: Fitri, R. et al. (2026)

The significant improvement in motor skills following the deep learning intervention is consistent with motor learning theory's emphasis on cognitive mediation of physical skill acquisition. Fitts and Posner's (1967) three-stage model posits that motor skill learning begins in a cognitive stage characterized by effortful, attention-demanding performance, during which verbal and conceptual understanding plays a crucial organizing role in guiding movement execution. The deep learning intervention's activation and conceptual exploration phases explicitly targeted this cognitive stage by ensuring students developed structured conceptual understanding of movement sequences before and alongside physical replication a sequence grounded in the pedagogical principle that meaning-making precedes and enhances skilled performance.

Crucially, however, the deep learning approach enhanced motor skill development not merely through increased practice time but through qualitatively superior forms of practice. Schmidt and Lee (2011) distinguish between blocked practice, in which the same skill is repeated in isolation, and variable and contextual practice, in which skills are enacted in varied and meaningful contexts that support richer encoding and transfer. The deep learning sessions incorporated contextual practice by embedding movement rehearsal within cultural narratives, expert performance analysis, peer feedback exchanges, and reflective self-evaluation, thereby creating the varied, meaning-rich practice conditions that motor learning research has consistently associated with superior long-term retention and transfer. Students were not merely accumulating repetitions but developing and refining a conceptual model of skilled performance that guided their physical actions with increasing intentionality.

The finding that spatial awareness and formation (pola lantai) showed the greatest relative motor skill improvement is theoretically significant and merits specific interpretation. Spatial awareness in dance the capacity to perceive, remember, and execute patterned spatial arrangements in relation to other performers is an inherently cognitive-motor ability that bridges physical and conceptual competencies. Improvement in this sub-dimension reflects both the embodied spatial practice conducted during rehearsal sessions and the cognitive mapping activities in which students analyzed formation patterns using diagrams and notation systems, a multimodal strategy consistent with Mayer's (2009) dual-coding theory of multimedia learning. Students who understood the spatial logic of pola lantai formations their relationship to the ceremonial context in which the dance is performed could organize and remember spatial patterns more effectively than students who had previously attempted to memorize them as disconnected configurations. This finding is consistent with Oreck's (2018) conclusion that integrating analytical and practical learning modes produces stronger motor outcomes than either mode deployed in isolation.

Comparison with existing research on motor skill development in traditional dance education in Indonesia supports and contextualizes these findings. Yuliawan and Supriyanto (2021) reported that

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secondary students taught Javanese classical dance through a combination of demonstration and cultural contextualization showed significantly better technical consistency than those receiving demonstration-only instruction, suggesting that cultural-cognitive framing enhances motor precision regardless of the specific dance tradition involved. The present study extends this finding to the Lampung dance context and provides a more systematically specified pedagogical framework the four-phase deep learning model through which this effect operates. By identifying the specific pedagogical mechanisms (conceptual exploration, reflective practice, metacognitive monitoring) through which cultural contextualization enhances motor learning, this study contributes theoretical specificity that Yuliawan and Supriyanto's work, among others, leaves underspecified.

The greater proportional improvement in cognitive skills (32.0%) compared to motor skills (26.5%) is a particularly revealing finding that invites careful theoretical interpretation. This divergence suggests that the deep learning intervention was especially effective in activating and developing cognitive engagement with Sigeh Pengunten a domain in which students' baseline was characterized not merely by gaps in knowledge but by habitual disengagement from cultural meaning-making in dance learning contexts. The effect aligns with Marton and Saljö's (1976) foundational argument that the adoption of a deep learning approach involves a qualitative transformation in how learners engage with content, not merely a quantitative increase in propositional knowledge. Students who had previously engaged with dance as a purely physical task were, under the deep learning intervention, systematically guided to engage with it as a culturally embedded, aesthetically structured, and conceptually rich practice.

The cognitive skills assessed in this study encompassing cultural knowledge, movement vocabulary, analytical reasoning, evaluative judgment, and reflective self-assessment map onto multiple ascending levels of the revised Bloom's taxonomy (Anderson & Krathwohl, 2001). Pre-test performance, concentrated primarily at the remembering and understanding levels, is consistent with the surface learning tendencies that Jazuli (2016) documented in Indonesian secondary dance education. Post-test performance, demonstrating students' capacity to analyze movement structures, evaluate performance quality against cultural-aesthetic criteria, and synthesize personal interpretive understanding, indicates a meaningful ascent through the taxonomy facilitated by the intervention's analytical and reflective pedagogical phases. This progression is precisely what deep learning pedagogy is theoretically predicted to produce, and the present study provides an empirical confirmation of this prediction in the specific context of traditional Indonesian dance education.

The metacognitive reflection component of the deep learning intervention comprising structured journaling and group discussion activities appears to have played a particularly important role in driving cognitive development. Flavell's (1979) foundational work established that metacognitive awareness the capacity to monitor and regulate one's own cognitive processes is a critical driver of deep learning outcomes. Students who systematically reflected on what they understood, what remained unclear, and how their understanding had evolved between sessions were engaged in precisely the metacognitive monitoring that promotes durable conceptual integration. Journal entries from mid-intervention phases showed students beginning to connect movement form with cultural meaning in ways they had not articulated at baseline, demonstrating the progressive deepening of understanding that metacognitive reflection facilitates. This finding corroborates Entwistle's (2009) claim that structured reflective activities are among the most powerful facilitators of the deep learning approach, particularly in contexts where cultural understanding and embodied knowledge must be integrated.

The deep learning intervention also fostered a form of culturally embedded aesthetic cognition specific to arts education that is not adequately captured by general models of cognitive skill development. When students engaged with the symbolism of Sigeh Pengunten's movements understanding the gerak sembah as an expression of the Lampung value of piil pesenggiri (dignity, self-respect, and commitment to cultural honor) they were not merely acquiring cultural knowledge as inert information. They were developing what Eisner (2002) described as "artistic thinking," a mode of cognition particular to arts learning that integrates perceptual, affective, and conceptual understanding in ways that cannot be reduced to propositional knowledge structures. This form of thinking knowing through feeling, perceiving through cultural understanding is the cognitive dimension of embodied artistic competency, and its development represents an educational achievement of considerable significance in its own right.

A central theoretical argument motivating this study's design was that motor and cognitive skill development in dance education are not independent, parallel processes but mutually constitutive dimensions of embodied learning. The strong positive correlation between post-test motor and cognitive skill scores ($r = 0.73$, $p < 0.001$) provides robust empirical support for this argument, indicating that students who developed greater cultural-aesthetic understanding also achieved higher levels of physical dance competency, and vice

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versa.

This finding is theoretically grounded in the framework of embodied cognition, which holds that cognitive processes are fundamentally shaped by and enacted through bodily experience (Varela, Thompson, & Rosch, 1991; Gallagher, 2005). In the dance education context, this means that understanding the cultural and aesthetic logic of a movement grasping why the gerak sembah should be performed with specific temporal quality, spatial orientation, and affective intention actively supports the development of the motor skill itself, not as a preparatory phase completed before physical practice but as an ongoing cognitive substrate that guides and gives meaning to physical action throughout the learning process. Conversely, the kinesthetic experience of executing a movement with genuine precision and control generates embodied knowledge that cannot be fully captured through verbal or notational description, creating a genuinely bidirectional relationship between physical skill and conceptual understanding that only an integrative pedagogical approach can adequately cultivate.

This integrative finding differentiates the present study from research traditions in dance education that address technical (motor) and cultural-aesthetic (cognitive) learning as separate instructional targets to be sequenced "technique first, then meaning." The deep learning model implemented here deliberately integrated both dimensions within each session, recognizing that artificial separation of technique and meaning impoverishes both the physical and intellectual dimensions of students' dance development. Hanna's (2008) argument that dance education must engage students as "thinking-feeling-acting" persons whose bodily intelligence is inseparable from their conceptual and emotional engagement with the art form provides a useful theoretical articulation of this integrative principle. The empirical results of this study support Hanna's theoretical stance with quantitative evidence from a specific traditional dance education context.

The findings carry significant implications for arts education practice at the secondary level in Indonesia. Most immediately, they provide evidence-based support for moving beyond demonstration-and-imitation as the default pedagogical model for traditional dance instruction. While imitative learning retains genuine value as an initial entry point into dance movement vocabulary, the present findings suggest that its sole or predominant use restricts students' development of the deeper motor-cognitive integration that characterizes genuine dance competency. The educational goal should not be imitation but understanding and the four-phase deep learning model implemented here demonstrates that this goal is achievable within the time constraints of a standard secondary school curriculum unit.

The structured deep learning framework comprising activation and contextualization, conceptual exploration, embodied practice, and metacognitive reflection offers a replicable and adaptable model for arts education practitioners across Indonesia. The framework does not require specialized facilities, expensive technology, or resources beyond those typically available in secondary schools, making it practically accessible for widespread implementation. Teachers who receive targeted professional development focused on facilitating deep learning processes asking generative questions, structuring peer analytical dialogue, scaffolding reflective writing could feasibly adopt this framework within existing curriculum structures. Investment in such professional development represents a high-leverage strategy for improving the quality of arts education at scale.

The study also underscores the importance of assessment reform in arts education. The predominance of performance-only assessment in current practice measures only the motor skill dimension of dance learning and inadvertently signals to students that cultural understanding and reflective analysis are peripheral to the educational purposes of dance. Integrating cognitive assessment tasks movement analysis essays, cultural interpretation activities, reflective performance evaluations into standard arts assessment frameworks would both align assessment with the goals of deep learning and communicate to students that intellectual engagement is central, not supplementary, to artistic development. Rohidi (2016) has argued consistently that the quality of arts education in Indonesia is constrained by the quality of its assessment practices; the present study provides specific empirical grounding for this critique and a direction for reform.

Finally, the cultural heritage transmission dimensions of this research warrant acknowledgment. Sigeh Pengunten is not merely a subject of educational study but a living cultural heritage whose intergenerational transmission depends upon the informed engagement of each generation of young learners. Evidence that deep learning pedagogy produces not only superior technical performance but richer cultural understanding suggests that pedagogically informed dance education can make a meaningful contribution to the sustained vitality of Lampung cultural identity. When students understand not only how to perform Sigeh Pengunten but why its movements carry the meanings they do, they are equipped to transmit the dance as a living cultural practice rather than as a museum artifact an educational achievement whose significance extends far

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beyond the assessment outcomes of any single classroom.

KESIMPULAN

This study has demonstrated that deep learning pedagogy exerts a significant and measurable positive impact on both the motor and cognitive skills of Grade 10 students engaged in learning Sigeh Pengunten dance at SMA Yadika Bandar Lampung. Motor skill scores improved by an average of 26.5% and cognitive skill scores by 32.0% following the eight-week deep learning intervention, with both improvements achieving statistical significance at $p < 0.001$. The strong positive correlation between motor and cognitive post-test outcomes ($r = 0.73$) confirms that these competencies develop interdependently when pedagogical approaches deliberately integrate physical and conceptual learning within a coherent, meaning-oriented instructional framework. These findings substantively challenge the dominant assumption in Indonesian secondary dance education that technical proficiency can be adequately developed through demonstration and repetition alone. The evidence indicates that a qualitative transformation in students' learning approach from surface imitation to deep understanding produces superior outcomes across both technical and intellectual dimensions of dance competency. The four-phase deep learning model deployed in this study offers a structured, evidence-based, and practically accessible framework for secondary arts educators seeking to enhance the quality of traditional dance instruction without requiring additional curriculum time or specialized resources. This research contributes to the emerging evidence base for pedagogically informed arts education in Indonesia, providing a specific and replicable model for integrating deep learning principles into traditional performing arts teaching. It further contributes to the literature on embodied cognition in educational contexts by demonstrating that deliberate pedagogical integration of cognitive and physical learning dimensions produces mutually reinforcing development in both. For the field of Pendidikan Seni, this study offers an important corrective to the tendency to treat technical skill and cultural-aesthetic understanding as separate instructional concerns, affirming instead that their integration is both theoretically grounded and empirically supported. Future research should examine the long-term retention of motor and cognitive gains following deep learning interventions in dance education, investigating whether the benefits demonstrated here persist over extended periods or require ongoing reinforcement. Comparative studies employing parallel control groups receiving conventional instruction would strengthen the causal claims of this study's one-group design. The applicability of the four-phase deep learning framework to other regional traditional dances across Indonesia Tor-Tor in Batak culture, Gandrung in Banyuwangi, Pakarena in Sulawesi, among many others represents a rich area for collaborative, multi-site research. Finally, investigations into the role of teacher professional development in enabling effective deep learning facilitation would provide critical insight into the systemic conditions necessary for scaling the benefits documented in this study.

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