Implementation of Deep Learning Approach of Pancasila Education to Increase Critical Thinking Students

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Abstract: Critical thinking is essential in 21st-century higher education, yet traditional Pancasila education often fails to develop this competency. This mixed-method study investigated how deep learning approaches pedagogical strategies emphasizing mastery, problem-solving, and disposition development enhance critical thinking among 120 undergraduate students at Universitas Wiralodra. Students were divided into experimental groups receiving deep learning instruction and control groups receiving traditional methods. Results showed experimental group students achieved substantially higher critical thinking scores with large effect sizes (Cohen's d=1.66, $p<0.001$). Qualitative findings revealed that problem-based learning, Socratic dialogue, and reflective practices enhanced students' analytical abilities and engagement. The main contribution of this study is demonstrating that contextualized deep learning pedagogies can effectively transform civic education from knowledge transmission to critical competency development in Indonesian higher education settings. Practically, this research provides evidence-based implementation frameworks for educators seeking to enhance critical thinking through authentic problem-solving and collaborative inquiry in Pancasila education.

Keywords: Deep learning approach, Pancasila education, critical thinking, higher education.

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Introduction

Critical thinking represents a fundamental competency for students navigating complex social, political, and ethical challenges in the 21st century (Cáceres et al., 2020). In Indonesian higher education, Pancasila education serves as a mandatory course designed to instill national values and civic competencies (Naval et al., 2022). However, this course has historically faced criticism for employing predominantly teacher-centered pedagogical approaches emphasizing memorization rather than critical engagement (Rosyad, 2024). This pedagogical limitation becomes problematic given contemporary demands for graduates who can think critically, analyze complex problems, and make informed decisions based on Pancasila values (Naval et al., 2022).

Previous research has documented the importance of critical thinking in higher education. Facione (2011) established that critical thinking encompasses interpretation, analysis, evaluation, inference, explanation, and self-regulation. Studies by Guo & Lee (2023) demonstrated that critical thinking can be taught through appropriate instructional strategies. In Indonesian contexts, researchers have explored Pancasila education's role in character formation (Anggraeni et al., 2023), nationalism development, and civic engagement (Zulyusri et al., 2023). However, these studies predominantly focused on traditional teaching methods with limited attention to innovative pedagogical approaches enhancing critical thinking skills. Internationally, civic and citizenship education has increasingly emphasized active learning pedagogies that develop analytical competencies essential for democratic participation (Sant, 2019; Taylor & Rouillard, 2021). Research in European and North American contexts has demonstrated that inquiry-based approaches in civic education effectively develop critical thinking and civic reasoning (Eriza Zuhry et al., 2024; Prayogi et al., 2023). However, these international frameworks have rarely been adapted to or empirically tested within Indonesian cultural and institutional contexts, creating a significant gap between global pedagogical innovations and local practices.

Recent scholarship has examined deep learning approaches in higher education. Deep learning, conceptualized by Liu et al. (2022) emphasizes mastery of challenging academic content, development of critical thinking and problem-solving skills, and formation of positive learning dispositions. This contrasts with surface learning focusing on memorization and information reproduction. Stasolla et al. (2025) demonstrated through constructive alignment theory that when teaching methods align with desired learning outcomes, students develop deeper understanding and higher-order cognitive skills. Studies implementing deep learning strategies have shown promising results in developing analytical capabilities (C. Wang et al., 2024).

Despite growing evidence supporting deep learning methodologies, three critical research gaps remain unaddressed. First, empirical evidence regarding deep learning effectiveness specifically in Pancasila education contexts is virtually nonexistent existing studies focus on Western educational settings with fundamentally different cultural assumptions about teaching, learning, and authority. Second, while quantitative studies have measured critical thinking improvements and qualitative studies have explored learning experiences, comprehensive mixed-method investigations integrating both perspectives within civic education remain scarce. Third, practical implementation frameworks demonstrating how to adapt deep learning strategies to resource-constrained Indonesian university contexts with large class sizes and limited professional development infrastructure are underdeveloped. Universitas Wiralodra faces particular challenges where preliminary observations revealed students struggled to connect Pancasila principles with contemporary issues and demonstrated limited analytical reasoning capacity.

This study is grounded in three interconnected theoretical frameworks. First, Constructive Alignment Theory by Fosnot & Perry (2005) posits that effective learning occurs when intended learning outcomes, teaching methods, and assessment tasks are systematically aligned. This theory guided the design of deep learning activities directly targeting critical thinking skills through problem-solving, questioning, and analytical tasks. Second, Critical Thinking Theory by Pedraja-Rejas et al. (2024) defines critical thinking as disciplined, self-directed thinking demonstrating intellectual excellence. This framework informed the specific critical thinking dimensions measured: analysis, evaluation, inference, deductive reasoning, and inductive reasoning. Third, Situated Cognition Theory Hussin & Tamuri (2019); Vygotsky (1978) emphasizes that learning becomes more effective when embedded in authentic contexts rather than presented as decontextualized information. This theory supported the implementation of problem-based learning using real societal issues, enabling students to develop critical thinking through meaningful engagement with authentic problems requiring application of Pancasila principles.

This study addresses a critical void at the intersection of civic education pedagogy, critical thinking development, and Indonesian higher education contexts. While international literature provides robust evidence for deep learning effectiveness in Western settings (Stasolla et al., 2025; S. Wang et al., 2020), no studies have systematically investigated how these approaches can be contextualized and implemented within Pancasila education a uniquely Indonesian civic education framework emphasizing national philosophical foundations. The novelty of this research manifests in four dimensions: (1) it represents the first empirical investigation integrating multiple deep learning strategies (problem-based learning, Socratic dialogue, reflective practices, collaborative inquiry, case analysis) into a

comprehensive pedagogical model specifically designed for Pancasila education; (2) it employs a convergent parallel mixed-method design providing both measurable evidence of critical thinking improvements and rich insights into learning mechanisms, offering understanding unavailable through single-method approaches; (3) it demonstrates successful implementation of inquiry-based pedagogies within traditionally teacher-centered Indonesian educational contexts, addressing concerns about cultural compatibility of Western pedagogical innovations; and (4) it provides practical, evidence-based implementation frameworks including specific challenges, facilitating factors, and strategies applicable to resource-constrained Indonesian universities with large class sizes. Based on the identified gaps and theoretical foundations, this study addresses three research questions:

1. Does the implementation of deep learning approaches significantly improve students' critical thinking skills compared to traditional teaching methods in Pancasila education at Universitas Wiralodra?
2. How do students experience and perceive deep learning strategies in Pancasila education, particularly regarding engagement, learning processes, and skill development?
3. What are the implementation challenges and facilitating factors for deep learning approaches in the specific context of Pancasila education at Universitas Wiralodra?

Research Method

Research Design

This study employed a convergent parallel mixed-method design, integrating quantitative quasi-experimental and qualitative phenomenological approaches. The quasi-experimental design was selected for pragmatic and ethical reasons: random assignment of individual students would disrupt established class structures and create contamination risks as students interact across conditions; using intact classes maintains ecological validity while enabling rigorous comparison (Creswell & Clark, 2017). While this design limits strong causal claims compared to true experiments, it strengthens external validity by examining interventions under naturalistic conditions representative of typical Indonesian university settings. The quantitative component utilized pre-test and post-test measurements comparing experimental and control groups, while the qualitative component employed interviews and observations. Both components were conducted simultaneously during one semester (14 weeks), with integration occurring during interpretation. This design was selected to capture measurable critical thinking outcomes and nuanced insights into learning processes.

Research Participants

The study involved 120 undergraduate students enrolled in Pancasila education courses at Universitas Wiralodra during the 2024 academic year. Participants were purposively selected from four faculties: Education, Engineering, Economics, and Social Sciences (30 students each). Students were randomly assigned to experimental groups (n=60) receiving deep learning instruction or control groups (n=60) receiving traditional instruction. For the qualitative component, 15 students from the experimental group were purposively selected using maximum variation sampling ensuring representation across genders, academic performance, and faculties. The single-institution design enables deep contextual understanding but limits generalizability; findings should be interpreted as context-specific evidence requiring replication across diverse settings. Table 1 presents participant demographics.

Table 1 Participant Demographics

Characteristic	Experimental Group (n=60)	Control Group (n=60)	Total (N=120)
Gender			
Male	28 (46.7%)	30 (50.0%)	58 (48.3%)
Female	32 (53.3%)	30 (50.0%)	62 (51.7%)
Faculty			
Education	15 (25.0%)	15 (25.0%)	30 (25.0%)
Engineering	15 (25.0%)	15 (25.0%)	30 (25.0%)
Economics	15 (25.0%)	15 (25.0%)	30 (25.0%)
Social Sciences	15 (25.0%)	15 (25.0%)	30 (25.0%)
Age (years)			
Mean (SD)	19.4 (1.2)	19.6 (1.3)	19.5 (1.3)
Range	18-22	18-23	18-23
Prior GPA			
Mean (SD)	3.18 (0.42)	3.15 (0.38)	3.17 (0.40)

Intervention Implementation

The deep learning approach was implemented through five integrated strategies over 14 weeks: (1) Problem-Based Learning, where students analyzed authentic societal problems (corruption, inequality, intolerance) through Pancasila perspectives; (2) Socratic Dialogue Sessions, facilitating structured questioning to examine assumptions and evaluate evidence; (3) Reflective Practices, requiring learning journals documenting thinking processes and perspective changes; (4) Collaborative Inquiry Projects, engaging group investigations of contemporary issues; and (5) Case Study Analysis, examining historical and contemporary cases requiring critical evaluation. The control group received traditional lecture-based instruction emphasizing textbook reading and memorization-focused assessments.

Data Collection

The California Critical Thinking Skills Test (CCTST) was selected because it has been validated in Indonesian contexts (Yaki, 2022), measures multiple critical thinking dimensions aligned with study objectives, and provides standardized scores enabling rigorous comparison. The 14-week intervention period was determined based on one semester duration sufficient time for pedagogical strategies to influence learning while maintaining practical feasibility within Indonesian academic calendars. Table 2 summarizes data collection methods, instruments, and procedures.

Table 2 Data Collection Methods

Method	Instrument	Participants	Timing	Purpose
Quantitative				
Pre-test	California Critical Thinking Skills Test (CCTST)	All students (N=120)	Week 1	Baseline critical thinking measurement
Post-test	CCTST	All students (N=120)	Week 14	Final critical thinking measurement
Qualitative				
Semi-structured interviews	Interview protocol (12 questions)	15 experimental students	Week 15	Explore learning experiences and perceptions
Classroom observations	Observation protocol	All experimental classes	Weeks 2-13 (12 sessions)	Document teaching strategies and engagement
Document analysis	Student reflection journals	15 experimental students	Throughout semester	Access cognitive processes and transformations

The California Critical Thinking Skills Test (CCTST) measures core critical thinking skills including analysis, evaluation, inference, deductive reasoning, and inductive reasoning, with established reliability (Cronbach's α = 0.78-0.82) in Indonesian contexts. Semi-structured interviews lasted 45-60 minutes, exploring learning experiences, perceptions of strategies, challenges, and perceived impacts. Classroom observations used structured protocols documenting teaching strategies, student engagement, questioning techniques, and interaction dynamics.

Data Analysis

Table 3 presents the data analysis procedures for both quantitative and qualitative data.

Table 3 Data Analysis Procedures

Data Type	Analysis Method	Software	Procedures
Quantitative			
Descriptive statistics	Mean, SD, frequency distributions	SPSS 26	Characterize sample demographics and score distributions
Independent t-test	Compare groups	SPSS 26	Compare post-test scores between experimental and control groups
Paired t-test	Within-group comparison	SPSS 26	Examine pre-post changes within each group
Effect size	Cohen's d	SPSS 26	Determine practical significance
Assumption testing	Shapiro-Wilk, Levene's test	SPSS 26	Assess normality and homogeneity of variance
Qualitative			
Thematic analysis	Braun & Clarke's (2006) six-phase approach	NVivo 12	Identify patterns and themes across dataset
Coding	Inductive coding	NVivo 12	Generate initial codes from data
Theme development	Organizing codes into themes	NVivo 12	Search for, review, and define themes
Inter-rater reliability	Cohen's kappa	NVivo 12	Two researchers independently coded subset (κ = 0.84)
Integration			
Mixed-method integration	Joint display analysis	Manual	Connect quantitative results with qualitative themes during interpretation

Trustworthiness in qualitative analysis was established through member checking with participants, peer debriefing among researchers, and maintaining a comprehensive audit trail. Integration occurred during interpretation, where qualitative themes explained and contextualized quantitative results

Result and Discussion

Critical Thinking Skills Improvement

Pre-test analysis confirmed baseline equivalence between groups, establishing that observed post-test differences resulted from the intervention rather than pre-existing disparities. Pre-test scores showed experimental (M=58.4, SD=9.2) and control groups (M=57.8, SD=8.7) were statistically equivalent, t (118) =0.38, p=0.71. Post-test results demonstrated

substantial between-group differences, with experimental students achieving significantly higher critical thinking scores.

Table 4 Critical Thinking Scores Comparison

Measure	Experimental Group (n=60)	Control Group (n=60)	t-value	p-value	Cohen's d
Pre-test					
Mean (SD)	58.4 (9.2)	57.8 (8.7)	0.38	0.71	0.07
Post-test					
Mean (SD)	76.8 (8.4)	63.2 (7.9)	9.32	<0.001***	1.66
Gain Score					
Mean (SD)	18.4 (10.0)	5.4 (8.5)	7.89	<0.001***	1.40
95% CI	[15.8, 21.0]	[3.2, 7.6]			

***p < 0.001

The large effect size (Cohen's d=1.66) indicates that deep learning approaches produced substantial practical improvements beyond statistical significance. Within-group comparisons revealed experimental students improved significantly from pre-test to post-test, t (59) =14.27, p<0.001, with mean increase of 18.4 points. Control group students also improved significantly but more modestly, t (59) =4.92, p<0.001, Analysis of critical thinking subscales revealed which specific cognitive dimensions benefited most from deep learning approaches (Table 5).

Table 5 Critical Thinking Subscale Scores (Post-test)

Subscale	Experimental (n=60) M (SD)	Control (n=60) M (SD)	t-value	p-value	Cohen's d
Analysis	15.8 (2.1)	12.3 (1.9)	9.76	<0.001***	1.75
Evaluation	16.2 (2.3)	12.8 (2.0)	8.82	<0.001***	1.57
Inference	15.4 (2.2)	13.1 (1.8)	6.50	<0.001***	1.16
Deductive Reasoning	14.8 (2.0)	13.6 (1.9)	3.47	0.001**	0.62
Inductive Reasoning	14.6 (2.1)	11.4 (1.7)	9.32	<0.001***	1.67

**p < 0.01, ***p < 0.001

The experimental group demonstrated particularly strong gains in analysis, evaluation, and inductive reasoning—precisely the dimensions targeted through problem-based learning and Socratic dialogue. Subgroup analyses across faculties revealed consistent patterns (effect sizes: d=1.42 to d=1.78), indicating deep learning approaches were equally effective regardless of disciplinary background.

Student Learning Experiences and Perceptions

Thematic analysis identified three major themes explaining how deep learning approaches enhanced learning experiences and critical thinking development.

Theme 1: Enhanced Engagement Through Authentic Problem-Solving

Students reported substantially increased engagement when Pancasila principles connected to real-world issues they recognized as meaningful. Classroom observations documented quantifiable engagement differences (Table 6).

Table 6 Classroom Engagement Indicators

Indicator	Experimental Group	Control Group	Difference
Average questions per session	8.4	2.1	+300%
Voluntary participation rate	78%	35%	+123%
Discussion time (minutes)	32	12	+167%
Student-initiated topics	5.2	0.8	+550%

One student articulated this transformation: "Before, Pancasila felt like historical facts to memorize. Now, analyzing real problems like corruption through Pancasila values makes the course meaningful. I actually want to participate because it matters" (Student 7, Engineering). Reflection journals revealed 87% of students (n=13/15) explicitly mentioned increased interest compared to previous educational experiences.

Theme 2: Development of Critical Inquiry Disposition

Students described fundamental shifts from passive information acceptance to active questioning and analysis. Classroom observations documented systematic progression in question sophistication across the semester, with analytical questions increasing from 10% (weeks 2-4) to 65% (weeks 12-14), demonstrating gradual development of critical inquiry habits. One student reflected: "I used to think there were simple right and wrong answers. The Socratic dialogues taught me to ask 'why' and 'how do we know that?' Now I question things more, even outside class" (Student 3, Social Sciences). Interview analysis revealed 93% of participants (n=14/15) reported applying critical thinking skills beyond Pancasila education to evaluate social media information, political discourse, and everyday decisions—evidence of successful transfer to authentic contexts. Figure 2 illustrates the progression of questioning sophistication documented through classroom observations.

Theme 3: Collaborative Knowledge Construction and Perspective-Taking

Students valued collaborative inquiry, describing how peer interaction enhanced learning through exposure to diverse perspectives. Table 7 presents collaborative learning outcomes from student interviews.

Table 7 Collaborative Learning Outcomes (n=15)

Outcome Category	Frequency	Representative Quote
Exposure to diverse perspectives	15 (100%)	Working with classmates from different faculties showed me the same Pancasila principle can be understood differently" (Student 5)
Improved articulation of reasoning	14 (93%)	Explaining my thinking to others helped me understand it better myself" (Student 11)
Constructive challenge of ideas	13 (87%)	Group discussions pushed me to defend my arguments with evidence, not just opinions" (Student 9)
Development of empathy	12 (80%)	I learned to understand why others think differently and respect their perspectives" (Student 2)

Observations confirmed that collaborative activities generated rich discussions where students built upon each other's ideas, respectfully challenged reasoning, and collectively constructed more sophisticated understandings than achieved individually.

Implementation Challenges and Facilitating Factors

Understanding implementation dynamics is essential for replication and scaling. Analysis identified both obstacles and enablers. (Table 8).

Table 8 Implementation Challenges and Facilitating Factors

Category	Challenges	Facilitating Factors
Time Management	1. Deep learning activities required more instructional time than lectures 2. Pressure to cover required curriculum content 3. Limited class periods (14 weeks)	1. Institutional flexibility in curriculum pacing 2. Focus on depth over breadth accepted by administration 3. Block scheduling for extended discussions
Student Readiness	1. Initial resistance to reduced instructor direction 2. Discomfort with ambiguity (68% in first 3 weeks) 3. Preference for clear, definitive answers	1. Gradual introduction of strategies 2. Explicit explanation of pedagogical rationale 3. Progressive skill scaffolding
Instructor Capacity	1. Substantial preparation time for problem design 2. Need for effective questioning skills 3. Creating appropriate scaffolding	1. Professional development workshops provided 2. Peer collaboration among faculty 3. Institutional recognition of pedagogical innovation

Class Size	1. Large sections (60 students) limited individual attention 2. Managing group discussions challenging	1. Strategic use of small group work 2. Peer facilitation training 3. Technology-enhanced collaboration tools
Resources	1. Limited access to case study materials 2. Need for authentic problem examples	1. Student diversity enriched discussions 2. Contemporary issues readily available 3. Faculty created shared resource repository

Despite challenges, institutional support, student diversity, and the value-laden nature of Pancasila education facilitated successful implementation. Student diversity across faculties enriched discussions by providing multiple disciplinary perspectives. The value-laden nature of Pancasila education created natural opportunities for analysis, evaluation, and ethical reasoning.

Discussion

The central finding that deep learning approaches substantially enhance critical thinking in Pancasila education extends international civic education research into Indonesian contexts while revealing specific pedagogical mechanisms enabling this improvement. The large effect size (d=1.66) exceeds typical educational interventions, suggesting that alignment between pedagogical methods and learning outcomes is particularly powerful when teaching complex cognitive skills like critical thinking. This finding supports Biggs and Tang's constructive alignment theory: when instruction directly targets desired outcomes through problem-solving, questioning, and analytical activities, students develop higher-order cognitive skills (Fosnot & Perry, 2005); Knox & Stevens, 1993).

The mechanism underlying critical thinking improvement involves three interconnected processes revealed through qualitative analysis (Hussin & Tamuri, 2019). First, authentic problem-solving activates student engagement by creating perceived relevance students invest cognitive effort when they recognize problems as meaningful (the 300% increase in questions and 123% increase in participation provide quantitative evidence) (Rivalina, 2020). Second, Socratic dialogue systematically develops questioning dispositions by modeling and rewarding inquiry behaviors the progression from 10% to 65% analytical questions demonstrates gradual internalization of critical thinking habits (Costes-Onishi et al., 2020). Third, collaborative inquiry creates cognitive conflict and perspective-taking opportunities 100% of interviewed students reported exposure to diverse perspectives, generating situations requiring analysis, evaluation, and synthesis of multiple viewpoints (Consuelo et al., 2019). These mechanisms work synergistically: engagement motivates

effort, questioning develops analytical habits, and collaboration provides contexts for practice.

The subscale analysis revealing particularly strong gains in analysis (d=1.75), evaluation (d=1.57), and inductive reasoning (d=1.67) illuminates which critical thinking dimensions deep learning approaches most effectively develop (Shawer, 2017). Problem-based learning required students to decompose complex societal issues into components and identify relationships directly exercising analysis (Poerwanti et al., 2022). Socratic dialogue emphasized systematic assessment of argument quality and evidence cultivating evaluation (Khurana et al., 2021). Collaborative inquiry demanded drawing conclusions from diverse information sources developing inductive reasoning. This targeted development suggests educators can strategically design learning experiences to cultivate specific critical thinking dimensions based on pedagogical choices.

The consistency of effects across faculties (d=1.42 to d=1.78) demonstrates that deep learning approaches transfer across disciplinary contexts within Pancasila education (Suyanto et al., 2020). While engineering, education, economics, and social science students bring different knowledge and epistemological assumptions, fundamental critical thinking processes analysis, evaluation, inference remain consistent across disciplines, making deep learning pedagogies universally applicable (Liu et al., 2022). This finding addresses concerns about disciplinary specificity of teaching strategies, though it should be noted that effectiveness within Pancasila education may not automatically generalize to discipline-specific courses requiring different types of reasoning (Kim, 2024).

The qualitative finding that 93% of students reported applying critical thinking skills beyond Pancasila education addresses a fundamental concern about transfer of learning (Suyanto et al., 2020). Traditional instruction often produces inert knowledge information students possess but rarely apply outside original learning contexts (Rahman, 2024). The deep learning approach appeared to facilitate transfer through three mechanisms identified in interviews: (1) using authentic contemporary problems blurred boundaries between academic exercises and real applications, (2) reflective practices encouraged metacognitive awareness enabling students to recognize when critical thinking was appropriate in new situations, and (3) explicit instruction in analytical frameworks provided tools students could consciously apply across contexts (Budiyono, 2025). However, these reports are self-perceptions; future research should employ behavioral measures of transfer to strengthen this conclusion.

Comparison with international civic education research reveals both convergence and divergence. Studies in European and North American contexts by Hess and McAvoy and

Parker demonstrated that inquiry-based approaches develop political reasoning and deliberative skills (Stokamer & Clayton, 2023). This study confirms these findings extend to Indonesian contexts, but with important qualifications: implementation required careful attention to cultural expectations about teacher authority and student roles (Hoggan-Kloubert & Mabrey, 2022). The 68% of students reporting initial discomfort with reduced instructor direction reflects cultural dimensions of Indonesian education, where traditional hierarchical relationships between teachers and students predominate (Biesta, 2014). Successfully implementing deep learning requires gradual introduction, explicit pedagogical rationale explanation, and substantial scaffolding suggesting that cultural context mediates implementation processes even when ultimate effectiveness remains consistent.

The implementation challenges identified time constraints, student resistance, instructor preparation demands, and large class sizes represent practical barriers requiring institutional responses for scaling (Simin & Saheed, 2019). Time constraints reflect fundamental tensions between curriculum breadth and learning depth. The substantial critical thinking gains justify reduced content coverage, supporting arguments that civic education should prioritize analytical competencies over encyclopedic knowledge (Winataputra, 2012). Student resistance highlights the need for change management strategies when introducing unfamiliar pedagogical approaches (Eriza Zuhry et al., 2024). Institutional support through professional development, curricular flexibility, and recognition systems proves essential for successful implementation, not merely desirable.

Research Limitations

Several limitations constrain interpretation and generalizability of findings. First, the quasi-experimental design using intact classes strengthens ecological validity but limits strong causal claims uncontrolled variables (instructor effects, class composition differences) may partially explain results, though baseline equivalence and large effect sizes suggest intervention effects predominate. Second, the single-semester duration demonstrates significant short-term effects but cannot establish whether critical thinking gains persist long-term longitudinal tracking would determine if improvements represented durable skill development or temporary performance enhancement. Third, the single-institution design at Universitas Wiralodra limits generalizability to other Indonesian universities with different resources, student populations, and institutional cultures findings should be interpreted as context-specific evidence requiring multi-site replication. Finally, implementation fidelity varied across experimental sections and was not systematically measured variation in instructor skill, adherence to protocols, and quality of facilitation may have influenced outcomes, potentially masking differential effects of implementation quality.

Conclusions

This study provides robust evidence that deep learning approaches substantially enhance critical thinking in Pancasila education, with large effect sizes (d=1.66) demonstrating practical significance beyond statistical results. The convergence of quantitative improvements and qualitative insights revealing enhanced engagement, questioning dispositions, and collaborative knowledge construction establishes that deep learning strategies effectively develop analytical capabilities through authentic problem-solving, Socratic dialogue, reflective practices, collaborative inquiry, and case analysis. The main contribution lies in demonstrating that contextualized deep learning pedagogies can successfully transform civic education from knowledge transmission to critical competency development within Indonesian higher education extending international frameworks to new cultural and institutional contexts while providing practical implementation evidence.

Based on these findings, several recommendations emerge for practice. Higher education institutions should reconsider pedagogical approaches in Pancasila education, gradually transitioning from traditional lecture-based methods toward deep learning strategies that develop critical thinking. This transition requires institutional support through faculty professional development programs focusing on questioning techniques, problem design, and facilitation skills; curricular flexibility allowing deeper content exploration rather than superficial coverage; assessment reform evaluating critical thinking processes rather than primarily measuring content knowledge; and recognition systems valuing pedagogical innovation in promotion and evaluation decisions. Instructors implementing deep learning approaches should anticipate initial student resistance by explicitly explaining pedagogical rationales and expected learning processes; provide progressive scaffolding that gradually reduces support as students develop autonomy; design authentic problems connecting Pancasila principles to contemporary societal issues students recognize as meaningful; employ strategic questioning techniques that model and reward inquiry behaviors; and create structured collaborative learning opportunities ensuring diverse perspective exposure. For Universitas Wiralodra specifically, scaling implementation across all Pancasila education sections with necessary faculty development and resources would institutionalize these innovations, though careful attention to implementation fidelity and ongoing quality monitoring remains essential.

Future research should address several directions to strengthen understanding and expand applicability. Longitudinal studies tracking students over multiple years would establish whether critical thinking gains persist, continue developing, or diminish after coursework completion. Multi-site studies across diverse Indonesian institutions varying in resources,

student populations, and geographical locations would establish generalizability and identify contextual factors influencing implementation success. Comparative effectiveness research examining different deep learning components would identify which strategies most powerfully develop specific critical thinking dimensions, enabling efficient implementation focused on highest-impact practices. Transfer studies employing behavioral measures would rigorously establish whether critical thinking skills developed in Pancasila education transfer to civic engagement behaviors including informed voting, community participation, and advocacy. Finally, implementation research investigating optimal models considering class size, faculty expertise, institutional resources, and cultural contexts would provide practical guidance for scaling deep learning approaches across Indonesian higher education systems.

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