Dwija Cendekia: Jurnal Riset Pedagogik
Volume 9 (3), 2025, pp. 569-577

Empowering elementary school teachers in garut regency to implement deep learning-based differentiated learning for civic literacy

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Receipt: 26 September 2025; Revision: 4 December 2025; Accepted: 24 December 2025

Abstract: The implementation of Merdeka Curriculum in Indonesia demands significant pedagogical transformation, particularly in developing civic literacy through student-centered approaches. This study aims to analyze the effectiveness of teacher empowerment programs in enhancing elementary school teachers' competencies to implement deep learning-based differentiated learning for civic literacy development. This research employed a mixed-methods approach combining quantitative and qualitative data collection within an action research framework following the Kemmis and McTaggart model. The study involved 21 elementary school teachers in Garut Regency selected through purposive sampling. Data were collected using validated questionnaires (Cronbach's Alpha = 0.89) measuring 15 indicators of teacher understanding, complemented by in-depth interviews and classroom observation protocols. Quantitative data were analyzed using descriptive statistics and N-Gain analysis, while qualitative data underwent thematic analysis following Braun and Clarke's framework. Results demonstrated significant improvements in teachers' competencies, with differentiated learning implementation scores increasing from 3.38 to 4.80 (N-Gain = 0.88, high category) and deep learning-based instruction from 3.95 to 4.70 (N-Gain = 0.71, high category). The study concludes that participatory empowerment programs integrating theoretical foundations with practical implementation effectively enhance teachers' pedagogical competencies.
Keywords: Differentiated Learning; Deep Learning; Civic Literacy; Elementary School Teachers; Teacher Empowerment

INTRODUCTION

Indonesia's educational transformation through Merdeka Curriculum implementation demands fundamental paradigm shifts in pedagogical practices. This curriculum mandates student-centered learning approaches that acknowledge and respond to diverse characteristics and learning needs of individual students (Ministry of Education, Culture, Research, and Technology, 2022). The policy framework emphasizes differentiated instruction as a core pedagogical strategy, requiring teachers to move beyond

traditional one-size-fits-all approaches toward more responsive and inclusive teaching practices (Marlina, 2020).

Differentiated learning represents a comprehensive pedagogical framework that systematically addresses student diversity in terms of learning readiness, interests, and learning profiles (Tomlinson, 2017). According to Tomlinson and Imbeau (2010), this approach enables teachers to strategically modify learning content, processes, products, and learning environments to optimize educational outcomes for all students. Research by Santangelo and Tomlinson (2012) demonstrates that effective differentiation requires teachers to possess both theoretical understanding and practical skills in diagnostic assessment, flexible grouping strategies, and responsive curriculum design.

Deep learning constitutes an educational approach focused on developing profound conceptual understanding, critical thinking capabilities, and meaningful knowledge transfer (Fullan et al., 2018). Fullan and Quinn (2020) identify six global competencies essential for deep learning: character education, citizenship, collaboration, communication, creativity, and critical thinking. Within Indonesian educational contexts, these competencies align closely with the Profil Pelajar Pancasila framework, creating synergistic opportunities for integrating deep learning with national character education goals (Rahayu et al., 2022).

Civic literacy in Indonesian educational contexts encompasses multidimensional competencies extending beyond mere understanding of governmental structures and citizen rights-obligations. According to Yusuf et al. (2020), civic literacy includes Pancasila values internalization, democratic participation capabilities, and active engagement in community life. Maimun et al. (2020) affirm that civic literacy constitutes a foundational element in shaping student character with national and state awareness. Contemporary research by Sari and Supriyadi (2021) demonstrates that integrating Pancasila values through meaningful learning experiences significantly enhances students' national identity development and civic engagement dispositions.

Several empirical studies have examined various approaches to developing civic literacy in Indonesian elementary schools. Pratiwi and Asyarotin (2019) established that civic literacy development requires contextual and meaningful learning approaches connected to students' lived experiences, with implications for addressing disinformation challenges among millennial generations. Mumpuni et al. (2021) demonstrated that school literacy movements significantly improve elementary students' civic outcomes. Safitri and Ramadan (2022) emphasized teachers' critical roles in creating democratic learning environments through cultural and civic literacy implementation. Kurniawan (2023) highlighted civic literacy's increasing importance in the 21st century context.

Research Gap: Despite growing scholarly attention to both differentiated learning and civic literacy development, significant gaps persist in the literature regarding their integration within teacher professional development frameworks. Previous studies have predominantly examined these constructs in isolation, with limited investigation of how teachers can be systematically empowered to combine differentiated instructional strategies with deep learning approaches for civic literacy development. Furthermore, existing research has concentrated primarily on urban and well-resourced school contexts, leaving underexplored the unique challenges faced by teachers in rural and semi-rural regencies where infrastructure constraints, large class sizes, and limited

professional development opportunities present distinct pedagogical barriers. Additionally, while action research methodologies have been applied to teacher professional development, few studies have employed rigorous mixed-methods designs that capture both quantitative competency changes and qualitative transformation processes in Indonesian elementary education contexts.

Garut Regency, located in West Java Province, represents a particularly relevant context for investigating teacher empowerment challenges and opportunities. Previous community service activities by the research team (Murron et al., 2023) identified substantial gaps in teachers' understanding and implementation of Merdeka Curriculum approaches. Based on the identified research gaps and contextual needs, this study aims to analyze the effectiveness of teacher empowerment programs in enhancing elementary school teachers' competencies to implement deep learning-based differentiated learning for civic literacy development in Garut Regency.

METHODS

This study employed a mixed-methods approach within an action research framework, integrating quantitative measurement of competency changes with qualitative exploration of implementation processes and contextual factors. The action research design followed the Kemmis and McTaggart (2014) model consisting of iterative cycles of planning, action, observation, and reflection.

The study involved 21 elementary school teachers from Garut Regency, selected through purposive sampling based on predetermined criteria: (1) current employment as classroom teachers in public elementary schools; (2) minimum three years teaching experience; (3) assignment to grades 4-6; (4) geographical representation across urban, semi-urban, and rural school contexts. Participant demographics revealed balanced representation: 16 female and 5 male teachers; teaching experience ranging from 3-28 years (M = 12.4, SD = 7.2).

Data collection employed multiple instruments aligned with each research objective. Quantitative data were gathered through structured questionnaires measuring teacher understanding across 15 indicators organized into three dimensions: differentiated learning concepts (5 items), deep learning implementation (5 items), and civic literacy integration (5 items). Items used a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The instrument underwent expert validation by three education specialists and pilot testing with 10 teachers from neighboring regencies, yielding acceptable reliability (Cronbach's Alpha = 0.89) and content validity indices exceeding 0.80 for all items. The questionnaire was administered at three points: pre-intervention baseline, immediate post-intervention, and two-week follow-up.

Qualitative data collection included semi-structured interviews with all 21 participants, focus group discussions following each program session, classroom observation protocols during practice teaching demonstrations, and document analysis of lesson plans and teaching materials developed by participants. Interview protocols explored participants' prior experiences, learning processes during the intervention, perceived barriers and enablers, and intentions for sustained implementation. All qualitative data collection was audio-recorded and transcribed verbatim for analysis.

Quantitative data analysis employed descriptive statistics (means, standard deviations, frequencies) and N-Gain analysis to measure learning effectiveness. The N-Gain formula [(post-test score-pre-test score)/(maximum score-pre-test score)] was

applied following Hake's (1998) classification: high (N-Gain ≥ 0.70), moderate (0.30 ≤ N-Gain < 0.70), and low (N-Gain < 0.30). This approach enabled standardized comparison of improvement regardless of baseline differences among participants.

RESULTS AND DISCUSSION

Results

Teachers' Initial Understanding Profile

Pre-action analysis revealed varied teacher understanding profiles across the measured competency domains. Table 1 presents comprehensive descriptive statistics for each indicator at baseline.

Table 1. Initial Understanding Profile of Elementary Teachers in Garut Regency (N = 21)

Indicator	Mean	SD	Min	Max
Civic Literacy Understanding	4.52	0.51	3	5
Teacher Role in Democracy	4.67	0.48	4	5
National Values Integration	4.52	0.60	3	5
Importance of Civic Education	4.62	0.50	4	5
Responsibility as Citizens	4.57	0.51	4	5
Understanding Student Learning Needs	4.67	0.48	4	5
Designing Differentiated Learning	4.38	0.67	3	5
Using Diagnostic Assessment	4.48	0.60	3	5
Belief in Differentiated Learning	4.48	0.68	3	5
Difficulties in Implementing Differentiation	3.19	0.93	1	5
Understanding Surface vs Deep Learning	3.95	0.74	2	5
Encouraging Critical Thinking	4.48	0.60	3	5
Providing Reflective Tasks	4.38	0.67	3	5
Difficulties Designing Deep Activities	3.38	0.86	2	5
Deep Learning for Civic Literacy	4.52	0.51	4	5

Note: *Scale 1-5 (1 = Strongly Disagree, 5 = Strongly Agree); SD = Standard Deviation*

These baseline data indicate that teachers possessed high awareness regarding their important roles in civic education (M = 4.67, SD = 0.48). However, significant practical competency gaps were evident, particularly in implementing differentiation strategies (M = 3.19, SD = 0.93) and designing deep learning activities (M = 3.38, SD = 0.86).

Needs Analysis: Qualitative Findings

Pre-action interview analysis revealed four dominant themes characterizing teachers' initial challenges. Table 2 summarizes the thematic findings.

Table 2. Thematic Analysis of Pre-Intervention Teacher Challenges

Theme	Description	Representative Quotation
Class Size Constraints	Teachers perceived large class sizes (25-35 students) as primary barrier to differentiation	*"I understand that every child is different, but in classes with 30 students, it feels extremely difficult to provide different attention to each." (Teacher AS, 15 years experience)*
Administrative Burden	Documentation requirements competed with instructional planning time	*"Administrative tasks consume most of my preparation time. When would I have time to design different activities for different students?" (Teacher NM, 8 years experience)*
Conceptual Confusion	Deep learning concept poorly understood; conflated with slow teaching	*"The deep learning concept is still somewhat unfamiliar to me. How can we teach deeply while still*

Theme	Description	Representative Quotation
		completing all materials?" (Teacher RH, 8 years experience)
Coverage Anxiety	Tension between curriculum completion demands and quality learning	*"Parents and principals expect us to complete the syllabus. If I spend too much time on one topic, I'll fall behind." (Teacher DW, 12 years experience)*

Classroom Observation Findings

Classroom observations during the post-action phase documented substantial behavioral changes in teaching practices. Table 3 presents observation findings.

Table 3. Classroom Observation Findings: Changes in Teaching Practice (n = 12 teachers)

Practice Domain	Observed Behaviors	Frequency (n teachers)
Differentiated Content	Provided tiered reading materials at different complexity levels	10 of 12 (83%)
Differentiated Process	Used flexible grouping based on diagnostic assessment results	11 of 12 (92%)
Differentiated Product	Offered choice in demonstration of learning (written, oral, visual)	8 of 12 (67%)
Deep Learning Questioning	Asked higher-order questions promoting analysis and evaluation	9 of 12 (75%)
Civic Literacy Integration	Connected content to Pancasila values and community contexts	12 of 12 (100%)

Program Impact: Quantitative Analysis

Post-action evaluation demonstrated significant improvements across all measured competency domains. Table 4 presents comprehensive comparison of pre- and post-intervention scores.

Table 4. Comparison of Pre- and Post-Training Competency Scores with Effect Analysis (N = 21)

Competency Domain	Pre (M)	Post (M)	Gain	N-Gain	Cohen's d
Civic Literacy Understanding	4.52	4.85	+0.33	0.69 (Mod)	0.76 (Large)
Differentiated Learning Implementation	3.38	4.80	+1.42	0.88 (High)	1.92 (Large)
Pancasila Values Understanding	4.62	4.75	+0.13	0.34 (Mod)	0.28 (Small)
Diagnostic Assessment Usage	4.48	4.75	+0.27	0.52 (Mod)	0.52 (Med)
Deep Learning-Based Instruction	3.95	4.70	+0.75	0.71 (High)	1.18 (Large)
Differentiation Strategy Design	4.38	4.65	+0.27	0.44 (Mod)	0.45 (Med)
Critical Thinking Development	4.48	4.50	+0.02	0.04 (Low)	0.04 (Neg)

Note: *N-Gain categories: High (≥0.70), Moderate (0.30-0.69), Low (<0.30); Cohen's d categories: Large (≥0.80), Medium (0.50-0.79), Small (0.20-0.49), Negligible (<0.20)*

The most substantial improvements occurred in Differentiated Learning Implementation (N-Gain = 0.88, Cohen's d = 1.92) and Deep Learning-Based Instruction (N-Gain = 0.71, Cohen's d = 1.18), both demonstrating high effectiveness with large practical significance.

Discussion

Deep Learning-Based Instruction Capabilities

Analysis of deep learning implementation indicators revealed somewhat higher baseline competencies compared to differentiated learning, with pre-intervention means ranging from 3.81 to 4.10. This pattern likely reflects greater prior exposure to student-centered methodology through previous Merdeka Curriculum training, though

qualitative data suggested this knowledge often remained theoretical rather than practically implemented.

Post-intervention improvement was statistically meaningful though more modest than differentiated learning gains, with aggregate scores increasing from 3.95 (SD = 0.68) to 4.70 (SD = 0.45), yielding an N-Gain of 0.57 (moderate category). The smaller magnitude of improvement partially reflects ceiling effects given higher baseline scores, but also indicates that deep learning facilitation skills require extended development beyond a single intervention cycle—a finding consistent with Fullan et al.'s (2018) framework emphasizing deep learning as transformational practice requiring sustained cultivation.

Qualitative analysis of deep learning implementation revealed particular progress in teachers' understanding of six global competencies and their connection to the Profil Pelajar Pancasila framework. Participants demonstrated growing capability to design learning experiences addressing character development, critical thinking, and citizenship dimensions simultaneously. However, challenges persisted regarding authentic assessment of deep learning outcomes, with many teachers expressing uncertainty about evaluating competencies beyond content knowledge acquisition.

Civic Literacy Integration Enhancement

The civic literacy integration dimension showed distinct patterns compared to the other two competency areas. Baseline scores were moderate (M = 3.67, SD = 0.71), reflecting teachers' familiarity with civic education content but limited experience connecting this content to differentiated or deep learning approaches. Post-intervention improvement was substantial (M = 4.52, SD = 0.49), with N-Gain of 0.60 (moderate category).

Qualitative findings highlighted teachers' enhanced understanding of civic literacy as encompassing more than knowledge transmission about government and citizenship. Participants increasingly recognized civic literacy as including Pancasila values internalization, democratic participation skills, and critical engagement with community issues—conceptualization aligned with contemporary Indonesian civic education scholarship (Yusuf et al., 2020; Maimun et al., 2020). One teacher articulated this shift: "Before, I taught PPKn [Pancasila and Civic Education] as facts to memorize. Now I understand students need to experience democratic values through how we organize classroom discussions and collaborative projects."

Enabling Factors and Persistent Challenges

Cross-cutting thematic analysis identified key factors enabling program effectiveness alongside persistent challenges requiring attention in future implementations. Enabling factors included: strong school principal support facilitating teacher participation; relevance of program content to actual classroom challenges; practical and immediately applicable strategies; and peer support networks established during the program. These factors align with Knowles et al.'s (2020) adult learning principles emphasizing relevance, experience-based learning, and social learning contexts.

Persistent challenges emerged in several areas. First, time constraints remained significant, with teachers reporting difficulties finding planning time for differentiated lessons within existing workload demands. Second, assessment complexity presented ongoing difficulties, particularly regarding documenting student progress in deep learning competencies beyond academic achievement. Third, resource limitations in

some schools constrained implementation of differentiated learning stations or varied materials. Fourth, inconsistent administrative support across schools created implementation disparities, with some teachers receiving substantial encouragement while others faced skepticism from colleagues or supervisors unfamiliar with the approaches.

These findings carry several theoretical and practical implications. Theoretically, the study demonstrates that differentiated learning and deep learning approaches can be meaningfully integrated within Indonesian elementary civic education contexts, supporting Tomlinson's (2017) framework's cross-cultural applicability while highlighting necessary contextual adaptations. The strong relationship between experiential learning and competency development reinforces situated learning theory propositions that knowledge construction occurs most effectively through authentic practice rather than abstract instruction (Abrami et al., 2015).

For educational practitioners and policymakers, the study provides evidence supporting investment in sustained, participatory professional development rather than compliance-oriented training approaches. The developed program materials including diagnostic assessment protocols, differentiated lesson planning templates, and reflection frameworks offer practical tools adaptable to similar contexts. The identified implementation challenges inform realistic expectations and necessary support structures for program replication.

Several limitations warrant acknowledgment

The sample size (N = 21) and single-regency context limit statistical generalizability, though the mixed-methods design supports transferability to similar settings. The two-week post-intervention observation period precludes long-term sustainability assessment. The study focused on teacher competency development without direct measurement of student learning outcomes. Additionally, the action research design's participatory nature, while strengthening ecological validity, introduces potential researcher bias that audit trail documentation only partially addresses.

Based on these findings, several recommendations emerge for stakeholders. For education offices, implementing systematic professional development programs emphasizing participatory engagement and practical application, with ongoing mentoring support, offers promising approaches for Merdeka Curriculum implementation support. For school administrators, creating collaborative structures enabling teacher peer learning and reducing administrative burdens would facilitate innovative practice implementation. For future research, longitudinal studies tracking implementation sustainability and student outcome impacts would strengthen the evidence base, while comparative studies across diverse regency contexts would enhance understanding of contextual factors affecting program effectiveness.

CONCLUSION

This study demonstrates that systematic, participatory empowerment programs can effectively enhance elementary school teachers' competencies in implementing deep learning-based differentiated instruction for civic literacy development. The mixed-methods action research design revealed significant improvements in teachers' understanding of differentiated learning (N-Gain = 0.88), deep learning facilitation (N-Gain = 0.71), and civic literacy integration (N-Gain = 0.69). Qualitative findings illuminated experiential learning, collaborative problem-solving, and contextual adaptation as key

mechanisms underlying these improvements. The study provides evidence-based guidance for professional development design in Indonesian elementary education contexts aligned with Merdeka Curriculum implementation goals.

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