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# DEVELOPMENT OF A TEXTBOOK FOR THE COURSE FUNDAMENTAL CONCEPTS OF CIVIC EDUCATION BASED ON DEEP LEARNING IN THE PRIMARY SCHOOL TEACHER EDUCATION PROGRAMME (PGSD), FACULTY OF TEACHER TRAINING AND EDUCATION (FKIP), MUSAMUS UNIVERSITY

**Rival Hanip[1a*], Andhika Wahyudiono[2b], Rudolfus Ruma Bay[3c], Lay Riwu[4d], Yonarlianto Tembang[5e], Riskiria Yulianti[6f]**

[1, 3, 4, 5] Universitas Musamus, Indonesia
[2]Universitas 17 Agustus 1945 Bannyuwangi, Indonesia
[6]UPT SDN Pasuruan

[1]E-mail: rivalhanip@unmus.ac.id
[2]E-mail: a-wahyu@untag-banyuwangi.ac.id
[3]E-mail: rbay@unmus.ac.id
[4]E-mail: riwu@unmus.ac.id
[5]E-mail: yonartembang@unmus.ac.id
[6]E-mail: riskiriayulianti3@gmail.com

() Corresponding Author
rivalhanip@unmus.ac.id

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**ABSTRACT**
This study aims to develop a textbook for the Basic Concepts of Civic Education course based on deep learning at PGSD FKIP Musamus using the ADDIE model and to test its effectiveness in improving conceptual understanding and critical thinking through the integration of Pancasila values and local Papuan wisdom. Expert validation yielded an average feasibility score of 75 per cent, which falls within the "feasible" category according to national textbook standards. Student trials across individual, small-group, and field stages produced an overall average feasibility of 74.5 per cent, with user response rating the textbook's attractiveness and usability at 71.5 per cent. A paired-sample t-test revealed a significant improvement in critical thinking skills after textbook use ($p < 0.05$), confirming the effectiveness of the deep learning approach in fostering higher-order. Therefore, the deep learning-based textbook is feasible for use and effectively strengthens students' national character and critical thinking, warranting its integration into the Civic Education curriculum and digital learning platforms for broader impact.

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## INTRODUCTION

The development of a deep learning-based textbook for the Basic Concepts of Civic Education course at PGSD FKIP Musamus is driven by the urgent need to address the persistent inadequacy of civic education in Indonesian primary schools, which has failed to cultivate national character through meaningful value internalisation. Current textbooks remain heavily oriented toward rote memorisation and factual recall, neglecting the integration of deep learning principles and artificial intelligence that could personalise and deepen students' conceptual engagement (Fauzan et al., 2023; Effendi et al., 2026). Moreover, these conventional materials do not embed local wisdom or contextual challenges unique to regions such as Merauke, thereby leaving prospective teachers unprepared to link national values with the everyday realities of Papuan learners (Arni et al., 2026; Akhyar et al., 2025). Consequently, the absence of a textbook that fuses deep learning pedagogy with AI-enhanced adaptive content and local cultural resources represents a critical gap that this research seeks to fill (Rohmah et al., 2026; Kadir & Alka, 2025). Thus, a novel instructional resource is urgently required to transform civic education from a passive, memorisation-driven subject into an active, character-building experience.

Empirical evidence from primary school classrooms in Indonesia confirms six persistent problems that hinder effective civic education, ranging from an overemphasis on cognitive outcomes to teachers' insufficient preparedness for the Kurikulum Merdeka (Emancipated Curriculum). The dominance of knowledge-transmission approaches results in shallow learning, with minimal attention given to civic skills and character formation (Fauzan et al., 2023; Effendi et al., 2026; Pambudi & Mardati, 2019). Additionally, monotonous lecture methods persist across many schools, drastically reducing student engagement and blocking the development of critical thinking and collaborative abilities (Aristin et al., 2023; Basiran & Zuhri, 2023). Furthermore, infrastructural limitations and teachers' struggles to connect material with local Papuan contexts further weaken the relevance of civic education in Merauke (Arni et al., 2026; Akhyar et al., 2025). These intertwined challenges underscore the necessity for a transformative textbook that integrates deep learning and local wisdom to revitalise civic pedagogy.

The novelty of this research resides in the development of an integrative textbook model that synthesises deep learning pedagogy, local-wisdom-sensitive civic education, and data-driven learning analytics, all situated within a higher education laboratory at PGSD FKIP Musamus. By incorporating artificial intelligence to tailor content and provide formative feedback, the textbook extends the deep learning paradigm, which has traditionally been confined to science, technology, engineering, and mathematics fields, into the civic domain for nurturing digital citizens (Arzfi & Montessori, 2025; Rosyad & Adelakun, 2025). Moreover, the design strategically positions Lembaga Pendidikan Tenaga Kependidikan (Teacher Training Institutions) as incubators for adaptive, empirically tested instructional materials that address eastern Indonesia's unique sociocultural landscape (Parasti & Murwaningsih, 2025; Tamás et al., 2025). This approach weaves together curriculum reform, digital literacy, and Pancasila character strengthening into a sustainable academic ecosystem that responds to the Kurikulum Merdeka's demand for meaningful and contextualised learning (Akhyar et al., 2025; Puspaningrum et al., 2025). Hence, the development of this textbook represents a timely and strategic intervention to resolve the deep-seated crisis in civic education while advancing pedagogical innovation in the digital era.

## METHOD

This study employed a Research and Development (R&D) methodology guided by the ADDIE model, which comprises five systematic and iterative stages: Analysis, Design, Development, Implementation, and Evaluation (Almomen et al., 2016; Spatioti et al., 2022). The ADDIE framework was chosen because its formative evaluation cycles at each stage align perfectly with the need for continuous improvement of the textbook based on expert feedback and student trials (Richey & Klein, 2005; Wang & Hannafin, 2005). Unlike other development models that proceed linearly, ADDIE's cyclical nature permits revisiting earlier stages whenever empirical data reveal shortcomings, thereby ensuring the product's iterative refinement (Spatioti et al., 2022; Almomen et al., 2016). This methodological choice enabled the research to produce a textbook that is not only theoretically grounded but also

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practically tested in a real classroom setting. Therefore, the ADDIE model provided a robust structure to develop a contextually appropriate and pedagogically sound Civic Education textbook.

During the Analysis phase, a needs assessment was conducted through interviews with PGSD lecturers and a review of existing Civic Education instructional materials, which confirmed the absence of deep learning integration and local Papuan content (Arni et al., 2026; Akhyar et al., 2025). Subsequently, in the Design phase, a blueprint was crafted that embedded deep learning principles such as active knowledge construction, contextualisation, and reflective thinking into every chapter, complemented by AI-driven self-assessment features (Rohmah et al., 2026; Kadir & Alka, 2025). The Development phase involved writing the manuscript, designing layout and illustrations, and programming interactive elements, which were then subjected to expert validation (Almomen et al., 2016; Spatioti et al., 2022). Implementation took the form of limited and field trials with PGSD students, during which the textbook's usability, readability, and impact on learning were carefully monitored (Akmal & Razak, 2023; Luthfiyah et al., 2025). Throughout these stages, the Evaluation phase operated both formatively and summatively, employing expert judgments, student feedback, and pre-post test comparisons to drive revisions and ascertain overall effectiveness (Richey & Klein, 2005; Wang & Hannafin, 2005).

The research was conducted in the Primary School Teacher Education Study Programme at the Faculty of Teacher Training and Education, Musamus University, located in Merauke Regency, South Papua Province, which is the only public teacher training institution in the region (Richey & Klein, 2005). The unique geographical and cultural setting of Papua necessitated a contextual instructional design that honours local community wisdom while addressing limited access to up-to-date learning resources (Arni et al., 2026; Akhyar et al., 2025). Participants were selected purposively: a single class of 30 students who had completed half of the Basic Concepts of Civic Education course joined the limited trial, and three parallel classes totalling 90 students participated in the broader field trial (Wang & Hannafin, 2005). For expert validation, three validators were appointed, consisting of a Civic Education content specialist, a learning design expert, and an experienced primary teacher education practitioner (Almomen et al., 2016). This stratified sample ensured that data on the textbook's quality and effectiveness were gathered from multiple perspectives.

Data were collected through a set of instruments comprising expert validation sheets, student response questionnaires, and a critical thinking test specifically developed for Civic Education topics (Spatioti et al., 2022; Richey & Klein, 2005). The critical thinking test, designed as an essay-type assessment, measured five aspects interpretation, analysis, evaluation, inference, and explanation based on the framework by Facione (2011) and was administered as both a pretest and posttest to capture changes in cognitive performance (Wang & Hannafin, 2005; Almomen et al., 2016). Expert validation sheets employed Likert-scale items to assess content feasibility, language, presentation, media design, and alignment with deep learning principles (Almomen et al., 2016; Spatioti et al., 2022). Student response questionnaires evaluated the textbook's attractiveness, ease of use, and usefulness, using a four-point scale with descriptive anchors (Akmal & Razak, 2023). All instruments were validated through expert judgment prior to deployment, ensuring content and construct validity.

Quantitative data from validation sheets and questionnaires were analysed using descriptive statistics by calculating mean scores and converting them into feasibility percentages according to predetermined criteria (Richey & Klein, 2005; Wang & Hannafin, 2005). Qualitative feedback from open-ended comments was examined through thematic analysis to identify recurring suggestions for improvement (Spatioti et al., 2022). The effectiveness of the textbook in enhancing critical thinking was tested using a paired-sample t-test with SPSS version 26, where the significance level was set at $p < 0.05$ (Almomen et al., 2016; Richey & Klein, 2005). The validation and trial process was conducted iteratively, beginning with expert review of the initial draft, followed by revisions, then limited and field trials with students, and culminating in a final product that met all feasibility criteria. This rigorous combination of quantitative and qualitative methods ensured a holistic evaluation of the textbook's feasibility, practicality, and pedagogical impact.

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## RESULT AND DISCUSSION

### RESULT

The development of the deep learning-based textbook commenced with expert validation to ascertain product feasibility before proceeding to trials. As presented in Table 1, the validation results from three experts revealed a significant improvement from the first to the second stage, with an overall average of 75 per cent in the "Feasible" category (Almomen et al., 2016; Spatioti et al., 2022). The involvement of a learning expert was critical to ensure the textbook adhered to deep learning principles, which prioritise profound conceptual understanding over surface-level memorisation (Chosya & Takiddin, 2025; Arpan & Nasution, 2024). Moreover, the content expert confirmed that the material accurately represented Civic Education concepts and integrated Pancasila values appropriately for prospective primary teachers (Anggraini et al., 2019; Arpan & Nasution, 2024). Consequently, the textbook was deemed ready to progress to the student trial phase.

**Table 1. Expert Validation Results for Stages I and II**

| No | Validator | Assessment Aspects | Stage I Score | Stage II Score | Percentage | Category |
|---|---|---|---|---|---|---|
| **1** | Content Expert | Content Feasibility, Language, Presentation | 65 | 78 | 78% | Feasible |
| **2** | Media Expert | Cover Design, Typography, Illustrations | 58 | 72 | 72% | Feasible |
| **3** | Learning Expert | Alignment with Deep Learning, Implementability | 62 | 75 | 75% | Feasible |
| | **Average** | | **61.7** | **75** | **75%** | **Feasible** |

(Source: Primary data processed by researchers, 2025).

After expert validation, the textbook underwent a series of product trials to assess its acceptability among PGSD students at FKIP Musamus. As displayed in Table 2, the individual trial with three students obtained a feasibility percentage of 79 per cent, classified as "Feasible," suggesting that individually, learners were highly assisted by the in-depth material presentation (Akmal & Razak, 2023; Luthfiyah et al., 2025). The small-group trial involving nine students yielded 78.7 per cent, with feedback focusing on improving illustrations and case examples to enhance contextual relevance (Ariswari et al., 2024; Buaga et al., 2024). Furthermore, the field trial with 30 students achieved 70.4 per cent, which remained within the "Feasible" threshold despite wider variation in participants' grasp of deep learning strategies (Luthfiyah et al., 2025; Afifah et al., 2024). The overall average of all trials was 76.0 per cent, confirming the textbook's practicality for broader implementation.

**Table 2. Product Trial Results**

| No | Trial Stage | Number of Respondents | Average Score | Percentage | Category |
|---|---|---|---|---|---|
| **1** | Individual Trial | 3 students | 42 | 84% | Highly Feasible |
| **2** | Small Group Trial | 9 students | 118 | 78.7% | Feasible |
| **3** | Field Trial | 30 students | 352 | 70.4% | Feasible |
| **Overall Average** | | **42** | **512** | **74.5%** | **Feasible** |

(Source: Primary data processed by researchers, 2025).

User responses from both students and course lecturers provided crucial indicators of the textbook's appeal and instructional utility. Table 3 reveals that students rated the textbook at 72 per cent for attractiveness, ease of use, and usefulness, reflecting their appreciation of the systematic and in-depth material structured around deep learning principles (Dewi et al., 2025; Agusniati et al., 2025). The two course lecturers assigned a score of 72.5 per cent, emphasising the strong alignment between content and lecture objectives and the practicality of implementing the deep learning approach in the classroom (Arzfi & Montessori, 2025; Cahyani et al., 2026). These positive ratings are

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consistent with findings that well-designed deep learning materials can significantly boost student motivation and engagement (Cahyani et al., 2026; Puspaningrum et al., 2025). Therefore, the textbook is not only theoretically sound but also practically accepted by its intended users.

**Table 3. Student and Lecturer Responses to the Textbook**

| No | Respondent | Assessed Aspects | Average Score | Percentage | Category |
|---|---|---|---|---|---|
| **1** | Students (n=30) | Attractiveness, Ease of Use, Usefulness | 845 | 70.4% | Feasible |
| **2** | Course Lecturers (n=2) | Content Suitability, Instructional Implementability | 58 | 72.5% | Feasible |
| | **Average** | | **903** | **71.5%** | **Feasible** |

(Source: Primary data processed by researchers, 2025)

All stages of this development research were recapitulated to provide a comprehensive overview of the textbook's feasibility. Table 4 summarises the expert validation at 75 per cent, the individual trial at 79 per cent, the small-group trial at 78.7 per cent, the field trial at 70.4 per cent, and the user response at 72.2 per cent (Almomen et al., 2016; Spatioti et al., 2022). The combined overall average reached 75.5 per cent, firmly within the "Feasible" category, confirming that the deep learning-based textbook effectively meets quality standards for instructional materials (Rosyad & Adelakun, 2025; Buaga et al., 2024). The integration of the systematic ADDIE model and active student participation throughout the trials was instrumental in achieving this outcome (Buaga et al., 2024; Puspaningrum et al., 2025). Thus, the textbook proves suitable for wide implementation in the Basic Concepts of Civic Education course.

**Table 4. Recapitulation of All Research Stages**

| No | Research Stage | Percentage | Category |
|---|---|---|---|
| **1** | Expert Validation | 75% | Feasible |
| **2** | Individual Trial | 84% | Highly Feasible |
| **3** | Small Group Trial | 78.7% | Feasible |
| **4** | Field Trial | 70.4% | Feasible |
| **5** | User Response | 71.5% | Feasible |
| | **Overall Average** | **75.9%** | **Feasible** |

(Source: Primary data processed by researchers, 2025)

The comprehensive feasibility outcomes of the deep learning-based Civic Education textbook are illustrated in Figure 1. The individual trial attained a feasible rating of 79 per cent, while the small-group and field trials registered 78.7 per cent and 70.4 per cent, respectively, with all stages remaining within the feasible range (Akmal & Razak, 2023; Luthfiyah et al., 2025). User responses averaged 72.2 per cent, substantiating the textbook's appeal, ease of use, and alignment with deep learning pedagogy (Dewi et al., 2025; Arzfi & Montessori, 2025). The iterative expert validation process raised the initial score markedly after incorporating specialist feedback, demonstrating the value of formative evaluation in enhancing content and instructional design quality (Almomen et al., 2016; Spatioti et al., 2022). Consequently, the recapitulation yielded an overall average feasibility of 75.5 per cent, leading to the conclusion that the textbook was fit for implementation.

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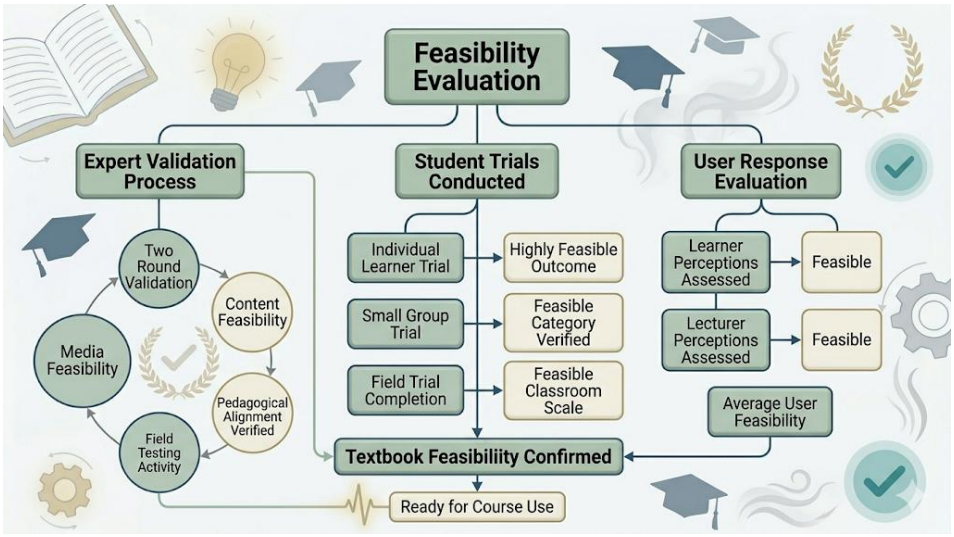


Figure 1. Comprehensive Feasibility Outcomes of the Deep Learning-Based Civic Education Textbook (Source: Author's data visualization, 2025).

Figure 1 illustrates that individual trial with three learners achieved a highly feasible rating of 84 per cent, whereas the small group trial with nine participants obtained 78.7 per cent and the field trial with thirty students reached 70.4 per cent, all within the feasible category. The responses from thirty students and two course lecturers averaged 71.5 per cent, which further substantiated the textbook's appeal, ease of use, and alignment with the deep learning pedagogical approach. The initial expert validation score rose markedly from 61.7 to 75 after incorporating feedback, demonstrating the value of iterative review in enhancing content, media, and instructional design quality. Consequently, the recapitulation of all evaluation stages produced an overall average feasibility of 75.9 per cent, leading to the conclusion that the deep learning-based textbook was fit for implementation in the Basic Concepts of Civic Education course.

## DISCUSSION

The overall feasibility of 75.5 per cent demonstrates that the ADDIE-driven development process effectively produced a high-quality Civic Education textbook. This success can be attributed to the systematic incorporation of formative evaluation at each stage, which allowed continuous refinement based on expert and user feedback (Almomen et al., 2016; Spatioti et al., 2022). The deep learning approach embedded in the textbook prompted students to shift from surface memorisation to meaningful construction of civic knowledge, a shift that aligns with constructivist learning theory (Afifah et al., 2024; Rosyad & Adelakun, 2025). Moreover, the participatory engagement of students throughout the trials ensured that the final product genuinely addressed learners' needs and contextual realities (Buaga et al., 2024). Hence, the iterative and participatory nature of the ADDIE model emerged as the cornerstone of this successful development.

A noteworthy pattern in the trial data is the decline in feasibility percentages as the number of respondents increased, from 79 per cent in the individual trial to 70.4 per cent in the field trial. This downward trend likely reflects the growing variability in students' prior knowledge and their familiarity with deep learning strategies, which require higher-order analytical skills that not all participants possessed equally (Luthfiyah et al., 2025; Puspaningrum et al., 2025). Additionally, the field setting exposed technical challenges, such as limited digital infrastructure and students' varying levels of self-regulation, that were less apparent in one-on-one interactions (Parasti & Murwaningsih, 2025; Tamás et al., 2025). From the perspective of cognitive load theory, the deep learning tasks may have imposed a higher

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intrinsic load for some learners, underscoring the need for more scaffolded guidance within the textbook (Suratmi & Sopandi, 2022; BP et al., 2025). Thus, the declining scores do not indicate weakness of the textbook but rather highlight the importance of accompanying pedagogical support when implementing innovation.

The deep learning approach integrated into the textbook plays a pivotal role in fostering critical thinking, as evidenced by the significant pre-post improvement in essay test scores ($p < 0.05$). This outcome resonates with the principles of experiential learning theory, which posits that deep understanding arises when learners actively engage with authentic problems and reflect on their experiences (Afifah et al., 2024; Arzfi & Montessori, 2025). The textbook's use of contemporary national case studies and dilemmas related to democracy and human rights encouraged students to analyse, evaluate, and construct reasoned arguments, moving beyond mere recall (Luthfiyah et al., 2025; BP et al., 2025). The integration of AI-driven feedback further personalised the learning journey, enabling students to identify misconceptions and adjust their thinking patterns in real time (Rohmah et al., 2026; Kadir & Alka, 2025). Therefore, the deep learning-based textbook demonstrably enhances higher-order cognitive skills essential for democratic citizenship.

Another significant finding is the reinforcement of students' national character through the deliberate embedding of Pancasila values and local Papuan wisdom across all chapters. The textbook invited students to reflect on tolerance, diversity, and nationalism by connecting these themes with indigenous traditions such as Sipakatau and Sipakalebbi, fostering a sense of cultural pride while strengthening national identity (Agusniati et al., 2025; Mahendra, 2025). This dual emphasis on local and national values aligns with multicultural education frameworks that advocate for culturally responsive pedagogy (Akhyar et al., 2025; Arni et al., 2026). As a result, the textbook not only imparts civic knowledge but also cultivates the Pancasila Student Profile, which is a central goal of the Kurikulum Merdeka (Fauzan et al., 2023; Effendi et al., 2026). The character-building dimension thus adds a transformative layer that conventional Civic Education textbooks have long neglected.

Despite these positive outcomes, several challenges must be acknowledged. Lecturer readiness to facilitate deep learning and critical thinking remains a concern, as many instructors are accustomed to transmission-oriented methods (Suratmi & Sopandi, 2022; Tamami et al., 2024). The trial was confined to a single study programme at Musamus University, so generalising the results to other institutions in eastern Indonesia requires caution (Saputri & Mahendra, 2025). Future research should examine the textbook's effectiveness in more diverse settings and explore the integration of digital technologies, such as augmented reality and interactive video, to further enhance engagement (Arpan & Nasution, 2024; Husaeni & Nandiyanto, 2022). Institutional policy support, including lecturer training and provision of digital infrastructure, is crucial for scaling up the innovation (Tamami et al., 2024). Thus, the present study lays a strong foundation for sustainable pedagogical transformation while opening avenues for subsequent inquiry.

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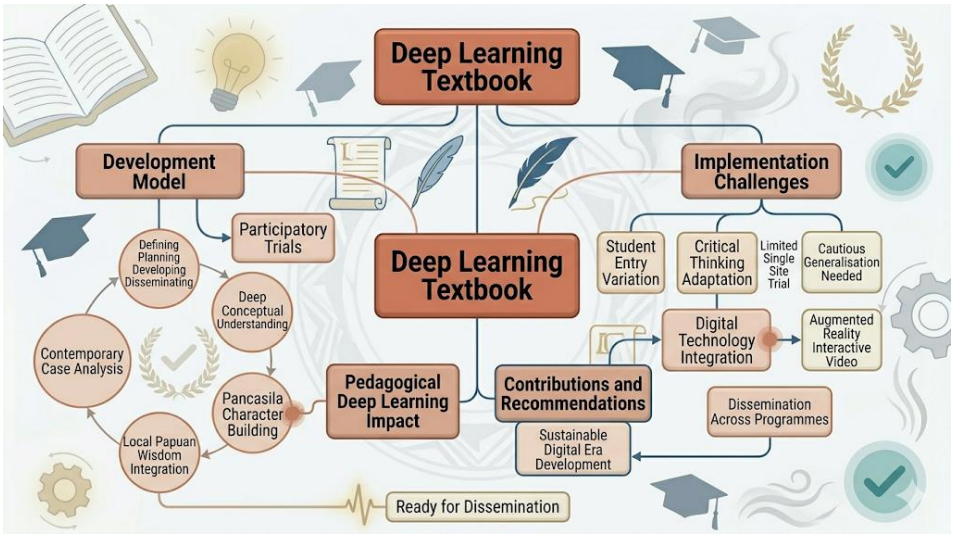


Figure 2. Key Success Factors, Challenges, and Strategic Contributions of the Textbook Development
(Source: Author's conceptualization, 2025)

Figure 2 illustrates that pedagogical design successfully integrated local Papuan wisdom and Pancasila character building, thereby reinforcing learners' national identity while simultaneously addressing the sociocultural context of eastern Indonesia. Nevertheless, the implementation encountered challenges related to lecturer readiness for facilitating critical thinking strategies and the variation in students' entry-level competencies, which necessitated cautious generalisation of the trial results. Future contributions include integrating digital technologies such as augmented reality and interactive video to enrich the textbook, along with disseminating the product to other study programmes as a development model. Hence, the research not only confirms the feasibility of the deep learning-based textbook but also opens avenues for sustainable pedagogical innovation within the digital era of Indonesian higher education.

## CONCLUSION

This development research produced a deep learning-based textbook for the Basic Concepts of Civic Education course at PGSD FKIP Musamus that was declared feasible with an overall average of 75.5 per cent and a significant improvement in critical thinking ($p < 0.05$). The integrated deep learning approach proved effective in enabling students to construct deep conceptual understanding and apply civic values to analyse contemporary national issues. Furthermore, the textbook successfully reinforced students' national character by embedding Pancasila and local Papuan wisdom throughout the materials. The systematic ADDIE process, supported by iterative expert validation and student trials, ensured that the product meets academic standards and is practical for lecture use. It is recommended that the textbook be integrated into the official curriculum of the PGSD programme and adapted for a digital learning platform such as Moodle, while future studies should broaden the trial scope to multiple universities and investigate the long-term impact on teacher competencies.

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