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Development of civics teaching modules for elementary school teacher education students with pedagogical content knowledge (pck) and growth mindset approaches

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Abstract

This study aims to develop a Civics Education teaching module for Elementary School Teacher Education students at the South Tapanuli Institute of Education that integrates Pedagogical Content Knowledge (PCK) and fosters a growth mindset, and to determine the feasibility and effectiveness of the module in improving students' pedagogical competence and positive attitudes. This study uses Research and Development (R&D) with the ADDIE model, including the stages of Analysis, Design, Development, Implementation, and Evaluation. The research sample consisted of 250 Elementary School Teacher Education students in the 5th semester, divided into 5 classes, with a trial limited to 50 students. Data collection techniques include expert validation, module trials, and student questionnaires to assess pedagogical competence and growth mindset. The results of the study indicate that the developed Civics Education teaching module is feasible to use, with an average expert validation score in the category of Feasible to Very Feasible. The module trial showed an increase in students' pedagogical competence (average score of 79.6, Good category), while the questionnaire results showed the module was effective in fostering a growth mindset (average score of 4.34, Good category). This teaching module was proven to be effective and applicable in Civics learning, and supported the development of students' pedagogical competence and positive attitudes towards learning. This study provides practical implications that the module can be used as an innovative learning medium that improves the teaching quality of Elementary School Teacher Education students.

INTRODUCTION

Background of the Study

Civics Education plays a crucial role in shaping the character, attitudes, and competencies of citizens. Through Civics Education, students learn about the values of Pancasila, the rights and obligations of citizens, tolerance, cultural diversity, and the importance of active participation in community life Naval, C., Villacís, J. L., & Ibarrola-García, S., 2022). Therefore, Civics Education teaching focuses not only on theoretical understanding but also on how these values can be understood, applied, and practised by students.

Prospective teachers, particularly Elementary School Teacher Education students, play a key role in preparing a younger generation with strong character and competencies (Ningtyas, RK, Sucahyo, E., & Zulfadli, Z., 2026). Therefore, Elementary School Teacher Education students must not only master Civics content but also understand how to effectively convey it to elementary school students. This knowledge, which combines content and teaching strategies, is known as Pedagogical Content Knowledge (PCK). PCK enables prospective teachers to understand what to teach and how to deliver it according to the characteristics and needs of their students (Schiering et al., 2022).

Several recent studies have shown that mastery of PCK has a significant impact on learning quality. For example, Sarkar et al. (2024) found that student teachers with PCK were better able to develop effective learning strategies and adapt material to students' understanding levels. This aligns with findings from Smit et al. (2023), which showed that increased PCK through teaching experience directly correlates with higher teaching quality. In other words, prospective teachers who understand PCK can design learning that is more engaging, understandable, and contextually relevant to students.

However, PCK skills alone are not enough to face the challenges of 21st-century education. Teachers and prospective teachers also need an adaptive and reflective mental attitude, known as a Growth Mindset. According to Macnamara, B., & Burgoyne, A. P. (2022), a Growth Mindset is the belief that a person's abilities and intelligence can be developed through effort, strategy, and continuous learning. Individuals with a growth mindset tend to be unafraid of facing difficulties, willing to learn from failure, and willing to try new methods to achieve better results.

The importance of a growth mindset in teacher education has been demonstrated through research in Indonesia. Rammstedt, B., Grüning, D., & Lechner,

C. M. (2022) found that growth mindset-based training can improve the professionalism and performance of elementary school teachers. Teachers or prospective teachers with a growth mindset tend to be more reflective in evaluating learning, creative in designing teaching modules, and persistent in facing various learning challenges. This is particularly relevant for elementary school teacher education students preparing to become professional teachers in the future (Sucahyo, E., Ningtyas, R. K., & Fithriyah, N., 2025).

However, the practice of developing Civics Education teaching modules for Elementary School Teacher Education students at several universities remains static. Existing modules typically focus solely on content, without emphasising students' ability to adapt learning methods, experiment, reflect, and develop professionally (Grapin, S. E., Haas, A., Llosa, L., & Lee, O., 2022). A dynamic curriculum and diverse student characteristics require prospective teachers to have teaching materials that are flexible, adaptable, and capable of stimulating students' creativity and growth mindsets.

Against this backdrop, this research aims to develop a PCK and growth mindset Civics Education teaching module for Elementary School Teacher Education students. This module is expected to: (1) Help students understand Civics material in depth and comprehensively (Waugh et al, 2025). (2) Train students to apply PCK in designing teaching strategies appropriate to the characteristics of elementary school students. (3) Foster a growth mindset in students so they become reflective, creative, and resilient future teachers. (4) Contribute to improving the quality of teacher education, which ultimately has a positive impact on the quality of learning in elementary schools (Boedeker et al, 2025).

Thus, the integration of PCK and growth mindset emphasizes not only mastery of content and teaching strategies, but also the development of character, professional attitudes, and adaptive skills in Elementary School Teacher Education students (Ningtyas, RK, Sucahyo, E., & Putri, D., 2024). This research is relevant to addressing the needs of teacher education in the modern era, where critical, creative, and reflective thinking skills are highly required.

The Problem of The Study

The quality of Civics Education instruction in elementary schools is greatly influenced by the competency of prospective teachers, particularly students in the Elementary School Teacher Education Study Program. Although Elementary School Teacher Education students are required to master content, many still lack

Pedagogical Content Knowledge (PCK), the ability to understand material and effectively convey it according to student characteristics (Pamintuan, C. F., 2024).

Furthermore, current civics teaching modules tend to be static and emphasise content alone, without providing students with opportunities to develop reflective thinking, experiment with learning strategies, or enhance their professional attitudes. This situation hinders the development of a growth mindset in students the belief that abilities and intelligence can be developed through effort, learning, and reflection (Yu, J., Kreijkes, P., & Salmela - Aro, K., 2022). Based on these conditions, the research questions are formulated as follows: (1) How can a Civics Education teaching module for Elementary School Teacher Education students be developed that integrates Pedagogical Content Knowledge (PCK) and fosters a growth mindset? (2) To what extent can the developed module improve the pedagogical competence of Elementary School Teacher Education students while fostering a growth mindset? (3) What is the feasibility and effectiveness of the developed teaching module when implemented in the classroom?

This research aims to address the gap in current teacher education practices, where the integration of material mastery, pedagogical skills, and professional development (growth mindset) is still limited. By developing an innovative module that combines PCK and growth mindset, this research is expected to provide practical solutions for improving teaching quality while also providing theoretical contributions to the development of teacher education.

Research's State of the Art

This research builds on a review of recent literature in teacher education, Pedagogical Content Knowledge (PCK), and growth mindset, particularly in the context of Elementary School Teacher Education (Lou, N., & Li, L., 2022). Previous research emphasizes the importance of PCK as a core competency for prospective teachers, enabling them not only to master the material but also to implement effective teaching strategies tailored to student characteristics (Kasi, Y. F., Widodo, A., Samsudin, A., Riandi, R., Sola, G. Y., & Pao, B., 2024). PCK has consistently been shown to correlate with improved teaching quality and improved student learning outcomes (Ning, Y., et al, 2024).

Simultaneously, research on growth mindset emphasizes the importance of cultivating adaptive, reflective, and resilient attitudes in pre-service teacher education. Students with a growth mindset are more likely to accept challenges, learn

from mistakes, and continuously refine their teaching methods (Tipton et al, 2023). Integrating a growth mindset into teacher education has been shown to enhance pedagogical competence and professional development, making psychological and motivational factors crucial for effective teaching practices.

However, there is a gap in the existing literature. Most previous studies have focused on PCK or growth mindset separately, while attention to integrating these two concepts into practical teaching modules remains very limited. Available Civics Education teaching modules are generally static and emphasize content, without facilitating reflective practice or the development of adaptive professional attitudes in Elementary School Teacher Education students (Sarkar et al, 2024). This gap highlights the need for research that combines theoretical foundations with practical applications to produce modules that can improve material mastery, pedagogical skills, and foster a growth mindset in students.

Thus, this research makes the following contributions: (1) It provides a theoretical basis that integrates PCK and growth mindset in pre-service teacher education, particularly in the Elementary School Teacher Education program. (2) It addresses practical needs by producing an innovative and adaptive Civics Education teaching module that can enhance students' pedagogical competence and professional attitudes. (3) It addresses a gap in the literature, as this research represents an original approach that combines pedagogical knowledge and growth mindset development in a single teaching resource (Grigaliūnienė et al, 2025).

Through a review and synthesis of related studies, this research clarifies the research focus, refines the problem formulation, and justifies the importance of developing theory-based yet applicable teaching modules in the context of pre-service teacher education.

Novelty, Research Gap, & Objective

This research is novel in integrating Pedagogical Content Knowledge (PCK) and growth mindset into a single Civics Education teaching module for Elementary School Teacher Education students. Most previous studies have emphasized only one aspect, either PCK or growth mindset separately (Almonacid-Fierro et al, 2023). The teaching module developed in this study not only presents Civics Education content but also facilitates students to develop pedagogical skills through a PCK approach and foster a growth mindset to become reflective, creative, and resilient prospective teachers (Chan, K., 2022). Thus, this research provides an original contribution because it

combines pedagogical competence and adaptive professional attitudes in a single teaching module that is applicable and easy to implement in the classroom.

Based on the literature review, several research gaps emerged that formed the basis for this study. First, the integration of PCK and growth mindset in teaching modules is still limited; existing Civics modules tend to be static and emphasize content mastery, without providing space for students to experiment, reflect, or develop adaptive professional attitudes (Behling, F., Förtsch, C., & Neuhaus, B., 2022). Second, available teaching modules do not directly support the development of students' pedagogical skills, resulting in prospective teachers' competence in delivering material effectively being suboptimal (Yulian, A., Dluha, S., Masithoh, A. D., & Rizqiyah, A., 2024). Third, previous research has focused on PCK or growth mindset separately, resulting in no study combining the two concepts in a single Civics teaching module for Elementary School Teacher Education students. This gap highlights the need to develop innovative teaching modules that can enhance pedagogical competence while fostering students' growth mindsets (Widodo, J., 2022).

Based on these novelties and gaps, this study aims to develop a PCK and growth mindset-based civics teaching module for Elementary School Teacher Education students. Furthermore, this study also aims to assess the feasibility and effectiveness of the developed module in improving students' pedagogical competence, as well as to evaluate the extent to which the module can foster students' growth mindsets so that they become reflective, creative, and adaptive future teachers. With these objectives, this study is expected to contribute both practically, through the development of a teaching module that can be directly applied, and theoretically, by increasing understanding of the integration of PCK and growth mindset in teacher education.

METHOD

Type and Design

This study employed Research and Development (R&D) to produce a valid and effective Civics Education teaching module based on Pedagogical Content Knowledge (PCK) and a growth mindset for Elementary School Teacher Education students. R&D was chosen because it is appropriate for research that not only produces a product (teaching module) but also empirically tests its feasibility and effectiveness (Anwar, F., Nujen, B., & Solli-Sæther, H., 2024). This study employed the ADDIE model, which

consists of five stages: Analysis, Design, Development, Implementation, and Evaluation. The ADDIE model was chosen because it is systematic, oriented toward learning development, and allows for continuous evaluation to refine the product (Okpatrioka, O., 2023).

Data and Data Sources

The research data came from 250 fifth-semester Elementary School Teacher Education students at the South Tapanuli Education Institute, divided into five classes. The data collected included students' understanding of Civics Education material, pedagogical skills, and perceptions and attitudes related to growth mindset. Furthermore, Civics lecturers served as data sources as expert informants to assess the module's feasibility. This approach aligns with R&D principles, which emphasize product validation through end-users and relevant experts (Rahardjanto, A., & Husamah, H. (2022).

Data Collection Technique

Data collection in this study was conducted using several complementary techniques to obtain valid and reliable data. First, a questionnaire was used to measure students' perceptions of the Civics teaching module and their attitudes regarding growth mindset, including the extent to which the module motivated students to think reflectively and creatively, and continuously develop their abilities. Second, tests and practical assignments were given to assess students' pedagogical competence in delivering Civics material, thus determining the module's effectiveness in improving students' teaching skills. Third, interviews and expert assessments were conducted with Civics lecturers to evaluate the appropriateness of the module's content, structure, design, and strategies, ensuring that the developed module met academic standards and student needs (Sucahyo, E., Ningtyas, R., & Sabri, S., 2025). Fourth, observations were conducted during the module trial to observe student interactions with the module, responses to the material, and the module's effectiveness in the learning process. This combined approach aligns with the principles of data collection in R&D research, namely the simultaneous use of quantitative and qualitative methods to obtain a comprehensive and in-depth picture (Tang, J. B., & Chung, K. C., 2025).

Data Analysis

Quantitative data from questionnaires and tests were analyzed using descriptive statistics, such as means, percentages, and frequency distributions, to determine students' level of understanding, module effectiveness, and perceptions of

growth mindset. Qualitative data from interviews, observations, and expert assessments were analyzed using qualitative descriptive analysis with triangulation techniques to increase validity (Abuhassna et al, 2024). This analytical approach aligns with the principles of evaluation in R&D, which emphasize product improvement based on empirical evidence (Ebrahimi, F., Masoudian, T., & Khiabani, M. M., 2025).

Research Stages Based on the ADDIE Model: (1) Analysis: Identifying student needs, problems in civics learning, and the competencies to be achieved. Analysis is conducted through initial observations, questionnaires, and interviews. This analysis aligns with instructional design theory, which emphasizes needs identification as the first stage of learning development (Spatioti, A., Kazanidis, I., & Pange, J., 2023); (2) Design: Developing a framework for a Civics Education teaching module based on PCK and a growth mindset, including learning objectives, strategies, methods, and learning media. This stage refers to learning design theory, which emphasizes systematic planning for an effective and structured module (Aydın, A., Gürsoy, A., & Karal, H., 2023); (3) Development: Teaching modules are created according to the design and then validated by subject matter and pedagogical experts to ensure the appropriateness of the content and design. This development aligns with R&D principles, which emphasize product validity testing before implementation (Zulkepli et al, 2024); (4) Implementation: The module was piloted on fifth-semester Elementary School Teacher Education students at IPTS. The pilot was conducted on a limited basis to identify deficiencies, then expanded to assess the module's effectiveness more comprehensively. This implementation aligns with design-based learning theory, which emphasizes piloting as part of product development (Chai et al, 2025); (5) Evaluation: Assess module quality, student pedagogical competency, and the module's influence on growth mindset. Evaluation results are used for final revision of the module for permanent implementation. This evaluation stage supports the ADDIE principle, which emphasizes continuous evaluation for product improvement (Ding, Y., & Toran, H., 2025).

RESULTS

This study aims to address three research questions: developing a PCK and growth mindset-based civics teaching module, improving students' pedagogical competence and growth mindset, and evaluating the module's feasibility and

effectiveness when implemented in the classroom. The research findings are presented in the following three sections.

1. Development of a Civics Teaching Module Based on PCK and a Growth Mindset

The Civics teaching module was developed using the ADDIE model, encompassing the stages of Analysis, Design, Development, Implementation, and Evaluation. The Analysis stage was conducted by identifying the needs of fifth-semester Elementary School Teacher Education students, difficulties in learning Civics, and aspects that support the development of a growth mindset. The Design and Development stage resulted in a module that combines Civics material, PCK strategies, and activities that foster a growth mindset, such as self-reflection, problem-solving, and creative discussion.

Initial validation was conducted by two experts: a Civics Education subject matter expert and a pedagogical expert. The validation results indicated that the module was suitable for use, with scores ranging from "Good" to "Very Good."

Table 1. Validation results of the Civic Education teaching module

Assessment Aspects	Material Expert	Pedagogical Expert	Average	Category
Content Eligibility	4,5	4,7	4,6	Very Good
Language Clarity	4,4	4,5	4,45	Good
Presentation Systematics	4,3	4,6	4,45	Good
Module Design	4,2	4,5	4,35	Good
Growth Mindset Integration	4,5	4,6	4,55	Very Good

These results indicate that the module meets academic standards and supports the development of students' pedagogical competencies and growth mindset.

2. Improving Students' Pedagogical Competence and Growth Mindset

The module was piloted on a limited basis with 50 fifth-semester Elementary School Teacher Education students. Assessments focused on two main aspects: pedagogical competence and growth mindset.

Table 2. Module Trial Results (Student Pedagogical Competence)

Pedagogical Competence Aspects	Average Score	Category
Learning Planning	80	Good
Delivery of Material	78	Good
Use of Media and Methods	82	Good
Assessment and Reflection on Learning	77	Very Good
Interaction with Students	81	Good
Total Average	79,6	Good

Additionally, students completed a questionnaire to assess their perceptions of the module and their growth mindset.

Table 3. Student Questionnaire Results (Growth Mindset and Module Perception)

Assessment Aspects	Average Score	Category
The module helps to understand Civics Education material	4,3	Good
The module encourages reflective thinking	4,4	Good
The module increases creativity	4,2	Good
Modules improve problem solving skills	4,3	Good
The module fosters learning motivation	4,5	Very Good
Total Average	4,34	Good

The results of the trial and questionnaire showed that the module was effective in improving pedagogical competence while fostering students' growth mindset.

3. Feasibility and Effectiveness of Teaching Modules in the Classroom

The results of expert validation, module trials, and student questionnaires indicate that the developed Civics module is:

a. Suitable for use, with an average validation score of 4.45–4.55.
b. Effective in improving students' pedagogical competence, with an average score of 79.6 (Good category).
c. Effective in fostering a growth mindset, with an average questionnaire score of 4.34 (Agree category).

Thus, the Civics Education module based on PCK and a growth mindset is valid, effective, and ready for classroom implementation, in accordance with the research objectives.

DISCUSSIONS

The results of the study indicate that the Civics teaching module developed using the ADDIE model and integrating Pedagogical Content Knowledge (PCK) and a growth mindset proved feasible and effective (Lestari, 2023). Expert validation showed an average score of 4.35–4.55, indicating the module met academic and pedagogical standards. This is in line with PCK theory, which emphasizes the importance of mastering material content as well as the ability to deliver material effectively (Wang, L., & Zhan, F., 2023). The integration of a growth mindset through reflection, problem-solving, and creative discussion activities supports students in developing a positive attitude towards learning, in accordance with Dong et al. (2023) findings that learning that encourages perseverance and reflective thinking fosters a growth mindset.

A module trial among fifth-semester Elementary School Teacher Education students showed an increase in pedagogical competence with an average score of 79.6 (Good category), particularly in the aspects of lesson planning, material delivery, media and method use, and interaction with students. These results support the PCK theory, which emphasizes that content mastery must be accompanied by the ability to design and implement effective learning (Kasi et al, 2024). Meanwhile, the questionnaire results showed an average score of 4.34 (Good) on the growth mindset aspect, which includes reflective thinking, creativity, problem-solving skills, and learning motivation. The activities in the module allow students to internalize the principles of a growth mindset, consistent with recent research that emphasizes that reflection-based learning and problem-solving can increase student motivation, creativity, and learning resilience (Ba, Y., Ming, W., & Zhang, H. 2025; King, R. B., & Wang, F., 2025).

Overall, the combined results of expert validation, module trials, and student questionnaires indicate that this Civics teaching module is feasible, effective, and applicable. The module not only presents Civics material in a structured manner but also supports the improvement of pedagogical competence and the development of students' growth mindsets. These findings align with the principles of R&D research in education, which emphasize the importance of product validation, trials, and evaluation before widespread implementation (Adeoye, 2024; Rahardjanto, A., & Husamah, H., 2022). The implications of this research are both practical and theoretical, namely that the module can be used as an innovative learning guide that improves the quality of teaching of Elementary School Teacher Education students,

while strengthening the literature on the integration of PCK and growth mindset in higher education.

CONCLUSION

Based on the research results, it can be concluded that the Civics teaching module developed for Elementary School Teacher Education students by integrating Pedagogical Content Knowledge (PCK) and growth mindset has proven to be feasible, effective, and applicable. This module meets the expert validation criteria with an average score in the category of Feasible to Very Feasible, so it can be used as a learning medium that supports mastery of Civics material and pedagogical strategies. The module trial showed an increase in students' pedagogical competence, including the ability to plan lessons, deliver materials, use of media and methods, and interact with students, with an average score in the Good category. In addition, the student questionnaire showed that the module effectively fosters a growth mindset, indicated by high scores in the aspects of learning motivation, reflective thinking, creativity, and problem-solving abilities. Thus, this Civics teaching module not only improves students' academic competence, but also forms a positive learning attitude and mental resilience, so it can be an alternative innovative learning medium for Elementary School Teacher Education students at the South Tapanuli Institute of Education.

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