

# Evaluation of Pre-Service Teachers in Integrating Character Values Through Teaching Practicum (PPL) in Mathematics Learning

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## Abstract

Character education has become one of the primary focuses of education in Indonesia to develop students who are not only academically competent but also possess strong moral values. This study aims to evaluate the ability of pre-service teachers to integrate character values during the Teaching Practicum Program (PPL) in mathematics learning. This research employed a qualitative descriptive approach involving seven mathematics education student teachers who conducted their teaching practicum in several secondary schools in Situbondo Regency. Data were collected through observation, interviews, and documentation, and analyzed using data reduction, data display, and conclusion drawing techniques. The findings revealed that most pre-service teachers had incorporated character values into their lesson plans; however, the integration was still largely administrative in nature. During classroom implementation, values such as creativity, independence, cooperation, religiosity, discipline, and honesty were successfully integrated through Problem-Based Learning and group discussion activities. Nevertheless, values related to nationalism, patriotism, appreciation of achievement, reading habits, and social awareness were not optimally integrated. The main challenges faced by pre-service teachers included curriculum demands, limited classroom management skills, and difficulties in contextualizing mathematics learning with character education. Therefore, stronger pedagogical preparation and continuous mentoring are required to improve character value integration in mathematics instruction.

**Keyword:** character education, teaching practicum program (PPL), mathematics learning.

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## Introduction

Education plays a significant role in developing students into individuals who are knowledgeable, responsible, and possess strong moral character. According to the Indonesian National Education System, education is intended to develop learners' potential so that they become faithful, knowledgeable, creative, independent, and responsible citizens (Depdiknas, 2003). In the era of globalization, education is expected not only to improve academic achievement but also to foster character development that enables students to face social and moral challenges effectively.

Character education has become a strategic priority in Indonesian education, particularly following the implementation of the Merdeka Curriculum and the Pancasila Student Profile framework. The Pancasila Student Profile emphasizes six key dimensions,

namely faith and noble character, global diversity, mutual cooperation, independence, critical reasoning, and creativity. These dimensions serve as the foundation for developing students who are academically competent and socially responsible citizens (Parwati & Suastra, 2024; Alanur et al., 2023). Recent studies indicate that character education should be integrated into classroom instruction rather than taught as a separate subject because character formation occurs most effectively through meaningful learning experiences. Mathematics learning offers substantial opportunities for character development. Although mathematics is often associated with cognitive skills, it also promotes values such as honesty, discipline, responsibility, perseverance, creativity, and cooperation. Problem-solving activities encourage students to think critically, work collaboratively, and develop resilience when facing challenges (Rahmi, 2013). Therefore, mathematics instruction should not solely focus on academic outcomes but should also contribute to students' character formation.

Mathematics education has significant potential to support the development of the Pancasila Student Profile. Mathematics learning encourages students to develop critical reasoning, creativity, independence, and collaborative problem-solving skills. Arifin (2023) argues that mathematics education is not limited to improving numeracy competencies but also contributes to fostering students' character development through inquiry, communication, and reflective thinking processes. Likewise, the development of mathematical literacy tasks based on the Pancasila Student Profile has been shown to improve students' problem-solving abilities while simultaneously strengthening character values (Tarisa et al., 2023).

Despite the importance of character education, its implementation in mathematics classrooms remains challenging. Many pre-service teachers prioritize academic achievement and curriculum completion over character development. This condition indicates the need to evaluate how effectively pre-service teachers integrate character values into mathematics instruction during their teaching practicum. Therefore, this study aims to examine the integration of character values by pre-service teachers during the Teaching Practicum Program in mathematics learning.

## Method

This study employed a qualitative descriptive research design. Qualitative research is intended to provide a comprehensive understanding of social phenomena through naturalistic data collection and contextual interpretation (Wina, 2013). This approach was chosen because it allows an in-depth exploration of how character values are integrated into mathematics learning by pre-service teachers. The participants consisted of seven mathematics education student teachers who were conducting their teaching practicum in several secondary schools (AN, AQ, LNL, WA, ZH, SNH, WW). Participants were selected using purposive sampling because they met specific criteria relevant to the objectives of the study (Sugiyono, 2018).

Data were collected through classroom observations, interviews, and documentation. Observations were conducted to examine the implementation of character values during mathematics instruction. Interviews were used to explore participants' strategies and challenges in integrating character education. Documentation analysis focused on lesson plans and teaching materials prepared by the student teachers (Sugiyono, 2018). Data analysis followed three stages: data reduction, data presentation, and conclusion drawing. These procedures enabled the researcher to systematically interpret the collected information and generate valid findings.

To enhance the trustworthiness of the findings, data triangulation was conducted by comparing information obtained from classroom observations, interviews, and lesson plan documents. Member checking was also employed by confirming interview interpretations

with participants. Each participant was observed during two to three mathematics lessons, resulting in a total of 18 classroom observations.

## **Result and Discussion**

### ***Character Education and the Pancasila Student Profile***

The findings of this study demonstrate that the character values integrated by pre-service teachers are closely aligned with the dimensions of the Pancasila Student Profile. Values such as independence, creativity, cooperation, and critical reasoning emerged during mathematics learning activities, particularly through Problem-Based Learning and collaborative discussion. This finding supports previous studies that identified critical reasoning and creativity as key competencies that can be effectively fostered through mathematics instruction (Kumala, 2023; Arifin, 2023).

However, dimensions related to global diversity and citizenship awareness were less visible in classroom implementation. Similar findings were reported by Istianah et al. (2023), who found that many schools still focus primarily on cognitive achievement while broader dimensions of the Pancasila Student Profile receive less attention. Consequently, teachers need more practical guidance on integrating social and national values into subject-specific learning activities.

### ***Character Value Integration in Lesson Planning***

The findings showed that most pre-service teachers included character values in their lesson plans and teaching modules. The most frequently stated values were cooperation, creativity, and independence. This finding demonstrates that student teachers recognize the importance of character education in classroom instruction (Fadilah et al., 2021).

However, the integration of character values was still largely administrative. Many student teachers merely listed character values in the learning objectives without clearly describing how those values would be developed during instructional activities. This finding suggests that pre-service teachers may understand the importance of character education conceptually, yet they still struggle to operationalize character values into concrete learning activities. The gap between planning and implementation indicates that character education remains procedural rather than pedagogically embedded (Rusman, 2016).

Furthermore, values such as patriotism and appreciation of achievement were rarely incorporated into instructional activities. Most lesson plans focused on developing cooperation and curiosity through group discussions rather than integrating broader social and national values.

## **Character Value Integration in Classroom Practice**

### ***1. Creativity and Independence***

Creativity and independence were fostered through the implementation of Problem-Based Learning (PBL). Student teachers presented contextual mathematical problems and encouraged learners to explore multiple solution strategies independently. Rather than directly providing answers, teachers guided students through questioning techniques that stimulated critical thinking and self-directed learning. This instructional approach aligns with the notion that mathematics learning can effectively cultivate creativity and independent problem-solving abilities when students are actively engaged in the learning process (Rahmi, 2013).

Classroom observations showed that one participant encouraged students to solve a linear equation problem using different strategies. Rather than providing direct answers, the teacher asked, "Can you find another way to verify your solution?" This question

stimulated students to compare alternative approaches and explain their reasoning. some examples of opinions from research subjects

Researcher : *"How do you cultivate creative thinking in students?"*

AN: : *"I intentionally give open-ended problems so students can explore different methods. My goal is not only to get the correct answer but also to encourage independent thinking."*

## 2. Cooperation and Curiosity

Cooperation was promoted through group discussion activities. Most student teachers organized heterogeneous groups to encourage peer learning and mutual assistance. Through collaborative problem-solving, students learned how to communicate ideas, share responsibilities, and support one another.

Curiosity was also stimulated during group activities, as students were encouraged to ask questions, explore alternative solutions, and participate actively in discussions. Such collaborative environments are consistent with twenty-first-century learning principles that emphasize communication and teamwork (Syafaruddin, Asrul, & Mesiono, 2012).

Researcher : *"Why did you choose group discussions in your learning?"*

WA : *"I intentionally give open-ended problems so students can explore different methods. My goal is not only to get the correct answer but also to encourage independent thinking."*

## Honesty, Democracy, and Tolerance

Values of honesty, democracy, and tolerance emerged through classroom presentations and open discussions. Students were encouraged to explain their reasoning processes and acknowledge mistakes without fear of criticism. This practice helped learners understand that honesty and learning from errors are essential components of academic growth (Asmani, 2011). In addition, classroom discussions provided opportunities for students to respect different opinions and engage in constructive dialogue, thereby fostering democratic attitudes and tolerance.

Researcher : *"How do you instill the value of honesty in mathematics learning?"*

LNL : *"During presentations, I ask students to explain their work process. If they make a mistake, I ask them to admit it and correct it together without fear of being blamed."*

## 3. Religiosity and Discipline

Religious values and discipline were integrated through routine activities such as praying before lessons, managing classroom time effectively, and adhering to established classroom rules. Student teachers also demonstrated positive role modeling by exhibiting responsible and disciplined behavior. Research indicates that teacher role models significantly influence students' character development because learners often imitate behaviors demonstrated by their teachers (Fadilah et al., 2021).

Researcher : *"Do you face any challenges while teaching?"*

WW : *"I don't think so. I don't have any trouble managing my time. I get everything I plan done well."*

### ***Challenges in Integrating Character Values***

Another important finding concerns the readiness of pre-service teachers to facilitate character-based mathematics learning. Recent research indicates that prospective mathematics teachers possess strong curiosity and critical thinking dispositions, which are essential for promoting student-centered learning environments (Umah & Rahmawati, 2023). Nevertheless, possessing positive dispositions alone is insufficient. Student teachers must also develop pedagogical competencies that enable them to transform mathematical content into meaningful learning experiences that support character development.

The challenge identified in this study suggests that teacher education programs should strengthen opportunities for pre-service teachers to practice character integration during teaching simulations and teaching practicums. Through continuous mentoring and reflective practice, student teachers can develop greater confidence in implementing character-based instruction in real classroom settings.

Despite several successful practices, the study identified various obstacles encountered by pre-service teachers. One major challenge was the pressure to complete the curriculum content within a limited time. Student teachers often prioritized academic achievement and curriculum targets over character development activities. Consequently, reflection sessions and character reinforcement activities were frequently omitted.

Another challenge involved classroom management. During group discussions, some students remained passive and relied heavily on more capable peers. This situation reduced opportunities for fostering responsibility and active participation among all learners. Effective cooperative learning requires strong classroom management skills to ensure equal engagement among group members (Rusman, 2016).

Additionally, student teachers experienced difficulties in connecting mathematical concepts with broader character values such as nationalism, patriotism, environmental awareness, and appreciation of achievement. This limitation indicates insufficient Pedagogical Content Knowledge (PCK) related to character-based instruction. Many participants perceived mathematics as a value-neutral subject and struggled to contextualize mathematical topics within social and cultural issues.

The findings also suggest that pre-service teachers tend to focus on procedural correctness rather than appreciating students' learning processes and creative efforts. Consequently, opportunities to develop values such as appreciation of achievement and social empathy are often overlooked.

### ***Implications of the Findings***

The findings demonstrate that character education cannot be effectively implemented merely by listing character values in lesson plans. Teachers need practical strategies for integrating character development into instructional activities. Character values should be embedded within learning tasks, classroom interactions, and assessment practices.

Therefore, teacher education institutions should strengthen character-based pedagogical training before students participate in teaching practicums. Supervising lecturers and mentor teachers should also provide continuous guidance regarding the implementation of character education in classroom settings.

Moreover, mathematics learning should be contextualized using real-life situations, cultural heritage, environmental issues, and national themes. Such contextualization can help students understand the relevance of mathematics while simultaneously developing positive character traits.

### ***The Role of Mathematics Learning in Character Development***

Mathematics is often perceived as a subject that primarily develops cognitive abilities. However, contemporary educational perspectives emphasize that mathematics also

contributes significantly to affective and character development. The learning process requires students to demonstrate persistence, responsibility, honesty, logical reasoning, and cooperation when solving problems. Therefore, mathematics can serve as an effective medium for character formation when teachers intentionally integrate character values into classroom activities (Rahmi, 2013).

In mathematics classrooms, students frequently encounter challenging situations that require patience and perseverance. When learners are encouraged to persist despite difficulties, they gradually develop resilience and self-confidence. These qualities are essential character traits that contribute not only to academic success but also to personal growth. Consequently, mathematics learning should be viewed as a holistic educational process that develops both intellectual competence and positive character.

Furthermore, mathematical problem-solving activities encourage students to think systematically and make decisions based on evidence. Such experiences promote responsibility and accountability because students must justify their solutions through logical arguments. This process indirectly supports the development of honesty and integrity, which are fundamental values in education (Asmani, 2011).

The findings of this study indicate that pre-service teachers were relatively successful in promoting personal character values such as creativity, independence, and discipline. However, broader social values were less visible during classroom implementation. This situation suggests that future teachers need a deeper understanding of how mathematics can be connected to social, cultural, and national contexts.

### ***The Importance of Pedagogical Content Knowledge for Character Education***

One of the most significant findings of this study is the limited ability of pre-service teachers to integrate character values into mathematical content meaningfully. This challenge is closely related to Pedagogical Content Knowledge (PCK), which refers to the ability to transform subject matter into effective learning experiences for students.

Strong PCK enables teachers to identify opportunities for character development within academic content. For example, statistical topics can be linked to social issues such as poverty, environmental sustainability, or public health. Geometry lessons can be connected to cultural heritage and traditional Indonesian architecture. Through such contextualization, students learn mathematical concepts while simultaneously developing awareness of social and cultural values.

Unfortunately, many pre-service teachers still perceive mathematics as an isolated discipline that is disconnected from real-life experiences. As a result, character education is often treated as an additional component rather than an integral part of instruction. This finding highlights the need for teacher education programs to strengthen character-based Pedagogical Content Knowledge.

Teacher education institutions should provide explicit training on designing learning activities that integrate both mathematical competencies and character values. Student teachers should be encouraged to analyze real-world problems, develop contextual learning materials, and create assessment instruments that evaluate cognitive and affective outcomes simultaneously.

Moreover, reflective teaching practices should be emphasized during teaching practicums. Reflection enables student teachers to evaluate the effectiveness of their instructional strategies and identify opportunities for improving character integration in future lessons.

### ***Integrating National and Cultural Values into Mathematics Learning***

One of the weakest aspects identified in this study was the integration of nationalism and patriotism. Most student teachers focused on procedural mathematical skills and rarely connected learning activities to national identity or cultural heritage.

In reality, mathematics provides numerous opportunities to introduce national and cultural values. Ethnomathematics, for example, demonstrates how mathematical concepts are embedded within cultural practices, traditional architecture, local crafts, and indigenous knowledge systems. By incorporating ethnomathematical perspectives into instruction, teachers can help students appreciate their cultural heritage while learning mathematical concepts.

For instance, geometry lessons can explore patterns found in traditional Indonesian batik designs. Statistical investigations can involve analyzing demographic data, economic indicators, or environmental issues relevant to local communities. Measurement topics can utilize examples from traditional buildings, monuments, and historical landmarks.

Such contextual learning experiences can strengthen students' national identity and sense of belonging. They also make mathematics more meaningful because learners can relate abstract concepts to familiar situations in their environment. Previous studies have shown that contextual learning increases student engagement and supports the development of positive attitudes toward learning (Syafaruddin et al., 2012).

Therefore, teacher education programs should introduce student teachers to ethnomathematical approaches and contextual teaching strategies. These approaches can help bridge the gap between mathematical knowledge and character education.

### ***Strategies for Strengthening Character Education in Mathematics Classrooms***

Based on the findings of this study, several strategies can be recommended to enhance character value integration in mathematics learning.

*First*, character values should be embedded within learning objectives and instructional activities rather than being treated as separate components. For example, when designing group activities, teachers can explicitly emphasize cooperation, responsibility, and mutual respect as expected learning outcomes.

*Second*, teachers should use authentic assessment methods that evaluate both academic performance and character development. Assessment instruments such as self-assessment, peer assessment, and reflective journals can provide valuable information regarding students' attitudes and behaviors during learning activities (Sugiyono, 2018).

*Third*, classroom discussions should encourage students to explain their reasoning processes and reflect on their learning experiences. Such reflective practices can foster honesty, accountability, and critical thinking. Students become more aware of their strengths and weaknesses while developing positive attitudes toward learning.

*Fourth*, teachers should utilize contextual and problem-based learning approaches. Real-world problems naturally provide opportunities for discussing social responsibility, environmental awareness, and ethical decision-making. Through meaningful contexts, students can understand how mathematics contributes to solving societal challenges.

Finally, teachers must serve as positive role models. Character education is most effective when learners observe consistent behaviors demonstrated by their teachers. Punctuality, honesty, fairness, respect, and responsibility should be reflected in daily classroom interactions. Students are more likely to internalize character values when they see them practiced authentically by their teachers (Fadilah et al., 2021).

### ***Implications for Teacher Education Programs***

The results of this study have important implications for teacher preparation institutions. Character education should not be viewed solely as a theoretical concept discussed in university courses. Instead, it must be integrated throughout the teacher education curriculum and reinforced during field experiences.

Teacher education programs should provide specialized workshops focusing on character-based lesson planning, classroom management, and contextual learning design. Student teachers need practical examples of how character values can be integrated into different mathematics topics.

Additionally, collaboration between universities and partner schools should be strengthened. Mentor teachers and university supervisors should provide regular feedback regarding both instructional effectiveness and character education practices. Structured mentoring programs can help student teachers develop confidence and competence in implementing character-based instruction.

Continuous professional development is also essential. Since educational challenges continue to evolve, future teachers must be prepared to adapt their instructional strategies while maintaining a strong commitment to character education. Through ongoing reflection, mentoring, and professional learning, pre-service teachers can become educators who successfully balance academic excellence with character development.

### ***Study Limitations***

This study has several limitations. First, the number of participants was limited to seven pre-service mathematics teachers from one teacher education institution, which may restrict the transferability of the findings. Second, classroom observations were conducted during a relatively short practicum period and may not fully capture long-term teaching practices. Third, the study focused primarily on teacher behavior and did not examine students' perceptions regarding the effectiveness of character value integration. Future studies could involve larger samples, multiple institutions, and student perspectives to provide a more comprehensive understanding of character-based mathematics instruction.

### ***Conclusion***

This study reveals that pre-service mathematics teachers have demonstrated awareness of the importance of character education by incorporating character values into their lesson plans and teaching modules. However, the integration remains largely procedural and administrative, as these values were not always translated into meaningful classroom practices. The findings show that values such as creativity, independence, cooperation, honesty, religiosity, and discipline were successfully developed through Problem-Based Learning, collaborative discussions, classroom routines, and teacher role modeling. In contrast, values related to nationalism, patriotism, appreciation of achievement, reading habits, and social awareness were less evident during classroom implementation, indicating that pre-service teachers still face challenges in connecting mathematical content with broader social, cultural, and national contexts.

Several obstacles were identified, including curriculum demands, limited classroom management skills, and insufficient pedagogical content knowledge for integrating character education into mathematics instruction. These findings suggest that effective character integration requires not only awareness of character education but also strong pedagogical competence and contextual teaching skills. Therefore, teacher education programs should strengthen training in character-based lesson design, contextual mathematics learning, authentic assessment, and reflective teaching practices, while mentor teachers and supervising lecturers should provide continuous guidance during teaching practicums. Although this study is limited by the small number of participants

and the relatively short observation period, it highlights the need for stronger pedagogical preparation, sustained mentoring, and contextual instructional strategies to ensure that character education becomes an integral part of mathematics learning rather than merely a formal requirement in lesson planning.

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