

Implementation of the IDEAL method in developing mentoring skills among PPG prospective teachers

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ABSTRACT

Background: Mentoring plays a critical role in supporting the professional development of prospective teachers during teacher professional education programs. In the context of the Indonesian Teacher Professional Education Program (PPG), mentoring practices often face challenges related to diverse academic backgrounds, particularly between graduates of teacher education and subject-matter disciplines. These conditions require a structured and reflective mentoring approach that can bridge pedagogical knowledge, content mastery, and classroom practice.

Aims: This study aims to examine the implementation of the IDEAL method in developing mentoring skills among mathematics PPG prospective teachers during the teaching practicum.

Methods: This study employed a qualitative descriptive approach with a reflective practice design. The participants were mathematics PPG prospective teachers undertaking their teaching practicum at a partner secondary school. Data were collected through classroom observations, reflective dialogues, and document analysis. The research procedure was structured according to the five stages of the IDEAL method: Identification, Listening, Exploration, Action, and Lesson (Reflection). Data were analyzed using reflective thematic analysis.

Result: The findings indicate that the IDEAL method facilitated a structured and reflective mentoring process that accommodated differences in academic backgrounds, strengthened pedagogical awareness, and enhanced professional confidence. Each stage of the IDEAL method supported prospective teachers in integrating pedagogical knowledge, content understanding, and reflective practice within authentic classroom contexts.

Conclusion: The study concludes that the IDEAL method provides an effective mentoring framework for supporting the professional development of mathematics PPG prospective teachers. By emphasizing dialogical interaction, experiential learning, and sustained reflection, IDEAL-based mentoring contributes to the development of mentoring skills and reflective professional identity during the teaching practicum.

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INTRODUCTION

The preparation of professional teachers increasingly relies on the Teacher Professional Education Program (PPG) as a structured pathway for fostering integrated pedagogical, professional, social, and personal competencies among prospective teachers. Teacher professional education is regarded as a critical phase in the development of professional capacity, as it emphasizes reflective practice, contextual pedagogical mastery, and the formation of teachers' professional identity (Darling-Hammond et al., 2017; OECD, 2019; Zeichner, 2010). Within the implementation of PPG, mentoring or supervision conducted by mentor teachers in partner schools plays a crucial role in bridging theoretical knowledge acquired during coursework with authentic classroom teaching practices. Through effective mentoring, PPG students are expected to develop contextual, reflective, and sustainable understandings of their professional roles as teachers (Korthagen, 2010; Feiman-Nemser, 2012).

Mentoring in teacher education is no longer perceived merely as an instructional or supervisory activity, but rather as a collaborative process that emphasizes dialogue, reflection, and shared learning. Reflective mentoring approaches have been shown to support prospective teachers in developing pedagogical awareness, enhancing teaching readiness, and constructing meaningful professional identities (Ambrosetti & Dekkers, 2010; Loughran, 2014; Hobson et al., 2009). Furthermore, high-quality mentoring contributes to the development of pedagogical decision-making skills and the ability to adapt teaching practices to dynamic classroom contexts (Hudson, 2013). Therefore, the quality of mentoring is a key determinant of the success of the PPG program in preparing professional and sustainable teachers.

In practice, mentoring mathematics PPG students faces challenges related to the diversity of students' academic backgrounds. Graduates from Faculties of Teacher Training and Education (FKIP) generally demonstrate stronger pedagogical competencies, such as lesson planning, assessment design, and understanding of student characteristics, yet often require further reinforcement in subject matter depth. In contrast, graduates from Faculties of Mathematics and Natural Sciences (MIPA) typically possess strong mathematical content knowledge but frequently encounter difficulties in presenting content pedagogically, contextually, and communicatively in the classroom (Shulman, 1986; Ball, Thames, & Phelps, 2008; Hill, Ball, & Schilling, 2008). These differences necessitate adaptive mentoring models that are responsive to individual learning needs.

In addition to academic background differences, the rapid development of digital technology has significantly influenced learning and mentoring processes within the PPG program. The integration of digital technology in teacher education is considered an essential requirement for preparing prospective teachers who are responsive to the demands of twenty-first-century learning (Koehler et al., 2013; UNESCO, 2021). PPG students generally demonstrate strong abilities in utilizing various digital learning platforms, such as Canva, Desmos, Wordwall, and Quizizz, which have the potential to support interactive and engaging mathematics instruction. However, the use of digital technology does not automatically lead to high-quality learning processes if it is not guided by pedagogical and reflective principles. Effective integration of technology requires mentoring that aligns technological use with instructional objectives, student characteristics, and meaningful pedagogical contexts (Mishra & Koehler, 2006; Tondeur et al., 2017). Within this context, deep learning has emerged as an important pedagogical approach in teacher education. Deep learning emphasizes active engagement in higher-order thinking processes, critical reflection, contextual problem solving, and the development of metacognitive skills. This approach encourages prospective teachers not merely to implement instructional procedures technically, but also to understand the pedagogical meaning underlying their instructional decisions (Fullan, Quinn, & McEachen, 2018; Hattie, 2012). Consequently, mentoring within the PPG program must be designed to systematically facilitate deep learning processes in a sustainable manner.

To support reflective mentoring oriented toward deep learning, a systematic, dialogical, and experience-centered mentoring approach is required, as emphasized in studies on reflective mentoring and practice-based teacher education (Hobson et al., 2009; Hudson, 2013). One relevant approach is the IDEAL method, which consists of the stages of Identification, Listening, Exploration, Action, and Lesson. Conceptually, the IDEAL method aligns with reflective and problem-solving-oriented learning approaches in professional education (Korthagen, 2010; Loughran, 2014). The IDEAL method is designed to facilitate mentoring processes that begin with identifying students' needs and challenges, followed by empathetic listening as the foundation for constructive mentoring relationships (Ambrosetti & Dekkers, 2010), exploration of pedagogical solution alternatives, implementation of concrete actions in teaching practice, and reflective lesson analysis as a basis for continuous professional development (Feiman-Nemser, 2012; Zeichner, 2010). Such a staged approach is consistent with principles of reflective mentoring and experiential learning that position students as active agents in their professional learning processes (Loughran, 2014; Feiman-Nemser, 2012).

Pedagogically, each stage of the IDEAL method corresponds to the characteristics of deep learning, which emphasize active engagement, critical reflection, and meaningful learning experiences (Fullan et

al., 2018; Hattie, 2012). The Identification and Listening stages foster early awareness and self-reflection on teaching experiences, serving as a foundation for the development of prospective teachers' professional identities (Korthagen, 2010; Loughran, 2014). The Exploration and Action stages facilitate active engagement in authentic problem solving and context-based pedagogical decision making (Ball et al., 2008; Hill et al., 2008). Meanwhile, the Lesson stage emphasizes critical reflection on practical experiences as a source of sustained professional learning that supports teachers' development as lifelong learners (Feiman-Nemser, 2012; Darling-Hammond & Oakes, 2019). Through this process, mathematics PPG students are expected to integrate pedagogical, content, and technological knowledge more meaningfully while developing mentoring skills and professional identities as future educators (Ball et al., 2008; Mishra & Koehler, 2006; Fullan et al., 2018).

Previous studies have examined mentoring and supervision in teacher education, particularly in relation to the development of prospective teachers' pedagogical and professional competencies. Several studies indicate that reflective mentoring positively contributes to teaching readiness and the formation of professional identity among teacher education students (Ambrosetti & Dekkers, 2010; Loughran, 2014; Feiman-Nemser, 2012). Other research highlights the importance of integrating pedagogical content knowledge in mentoring processes to bridge content mastery and pedagogical competence among students from diverse academic backgrounds (Ball et al., 2008; Hill et al., 2008; Korthagen, 2010). In addition, studies on digital learning suggest that technology integration can enhance student engagement and reflective learning quality when supported by appropriate pedagogical approaches (Mishra & Koehler, 2006; Tondeur et al., 2017; Fullan et al., 2018).

Nevertheless, existing studies tend to examine mentoring, digital technology use, and deep learning as separate dimensions. Research on mentoring in teacher education often focuses on supervision or coaching, while studies on digital learning primarily emphasize the effectiveness of media and platforms. Meanwhile, deep learning in teacher education remains largely discussed at a conceptual level and has not been sufficiently integrated empirically into mentoring practices for PPG students (Hobson et al., 2009; Hudson, 2013). Consequently, there is limited research providing a comprehensive understanding of how structured reflective mentoring models can simultaneously accommodate diverse student backgrounds, guide pedagogically meaningful technology integration, and promote deep learning. Furthermore, empirical studies that specifically investigate the implementation of reflective and dialogical mentoring models such as the IDEAL method within the context of mentoring mathematics PPG students remain scarce. Given the potential of structured and collaborative mentoring approaches to enhance mentoring skills, reflective awareness, and integrative pedagogical capacities, further empirical investigation is necessary.

Therefore, this study aims to empirically examine the implementation of the IDEAL method in developing mentoring skills among mathematics PPG students. The findings of this study are expected to contribute theoretically to the development of reflective mentoring models in teacher professional education and practically to support mentor teachers and PPG providers in designing more adaptive, meaningful, and deep-learning-oriented mentoring practices.

METHOD

Research Design

This study employed a qualitative descriptive approach with a reflective practice design to explore the implementation of the IDEAL method in developing mentoring skills among PPG mathematics prospective teachers. A qualitative approach was considered appropriate because the study aimed to capture mentoring processes, reflective experiences, and contextual teaching practices in an authentic school setting (Creswell & Poth, 2018). The reflective design allowed the researcher to examine how mentoring interactions and guided reflections contributed to students' professional learning throughout the mentoring process (Loughran, 2014).

Participants

The study was conducted during the Teaching Practicum Program (PPL) at SMP Global Madani. The participants were mathematics PPG prospective teachers with diverse academic backgrounds, including graduates from the Faculty of Teacher Training and Education (FKIP) and the Faculty of Mathematics and Natural Sciences (MIPA). This diversity provided a meaningful context for examining mentoring processes, as differences in pedagogical knowledge and content mastery influenced students' mentoring needs and professional development. The mentoring process was carried out throughout the practicum period, encompassing lesson planning, classroom implementation, and reflective evaluation.

Data Collection Techniques

Data were collected using multiple qualitative techniques to ensure a comprehensive understanding of the mentoring process. First, classroom observations were conducted to identify students' initial conditions, observe teaching practices of mentor teachers and mathematics teachers, and examine students' classroom implementation. Second, reflective dialogues and informal interviews were carried out to explore students' experiences, challenges, expectations, and reflections during each stage of mentoring. Third, document analysis was used to examine lesson plans, teaching modules, observation sheets, and students' reflective notes. The use of multiple data sources supported methodological rigor through triangulation (Merriam & Tisdell, 2016).

Research Procedure

The research procedure was structured according to the stages of the IDEAL method, which reflects a cyclical and reflective mentoring process aligned with experiential and problem-based professional learning (Korthagen, 2010; Schön, 1983). The overall structure of the IDEAL mentoring process is illustrated in Figure 1.



Figure 1. IDEAL mentoring model for PPG prospective teachers

This figure illustrates the cyclical mentoring process consisting of five interconnected stages: Identification, Listening, Exploration, Action, and Lesson (Reflection).

1. Identification Stage

The mentoring process began with identifying students' initial conditions through observations of pedagogical competence, content mastery, and technology use. This stage served as the basis for determining individualized mentoring strategies.

2. Listening Stage

The researcher provided an open and supportive dialogical space for students to express their challenges, expectations, and learning needs. This stage emphasized empathetic listening to foster self-awareness and build students' confidence before moving to deeper exploration.

3. Exploration Stage

Students were engaged in observing classroom practices of mentor teachers and other mathematics teachers, analyzing student characteristics, and conducting interviews with homeroom teachers and school counselors. Based on these activities, students collaboratively designed lesson plans using innovative instructional models tailored to classroom contexts.

4. Action Stage

Students implemented their refined lesson plans in real classroom settings, while mentor teachers, supervising lecturers, and peers acted as observers. Observations focused on student engagement, instructional strategies, and formative assessment practices.

5. Lesson (Reflection) Stage

After teaching practice, students participated in guided reflective discussions to evaluate their teaching experiences, identify strengths and areas for improvement, and formulate follow-up actions. Reflection was conducted continuously to support sustainable professional learning.

Data Analysis

Data analysis was conducted using reflective thematic analysis, involving data reduction, categorization, and interpretation to identify patterns in students' mentoring skill development across the IDEAL stages (Braun & Clarke, 2006; Miles, Huberman, & Saldaña, 2014). Coding was guided by the IDEAL framework to ensure coherence between the research design, procedures, and findings. Data credibility was enhanced through triangulation of data sources and reflective discussions with students and supervising lecturers.

RESULTS AND DISCUSSION

Results

The results of this study present a comprehensive description of how the IDEAL method was implemented in mentoring mathematics PPG prospective teachers during the teaching practicum program. The findings focus on the mentoring processes that occurred throughout the practicum, highlighting how structured and reflective mentoring supported prospective teachers' professional learning and instructional development. To ensure clarity and coherence, the results are systematically organized according to the five stages of the IDEAL method: Identification, Listening, Exploration, Action, and Lesson (Reflection), which collectively illustrate the progression of mentoring from initial needs assessment to reflective professional growth.

Identification Stage

The initial mentoring stage focused on identifying the baseline conditions of PPG prospective teachers from different academic backgrounds, namely graduates of the Faculty of Teacher Training and Education (FKIP) and the Faculty of Mathematics and Natural Sciences (MIPA). The identification process was conducted through classroom observations and informal assessments of pedagogical competence, content mastery, and technology use.

The findings indicate that FKIP graduates demonstrated relatively strong pedagogical skills, including lesson planning, understanding of assessment principles, and formulation of instructional objectives. However, these students required further support in deepening their mathematical conceptual understanding, particularly when addressing students' conceptual and application-based questions. In contrast, MIPA graduates exhibited strong mastery of mathematical content but experienced difficulties in designing student-centered learning environments and integrating pedagogical principles and formative assessment into classroom practice.

Despite these differences, all participants showed strong digital literacy skills. They were proficient in using digital tools for instructional media development, assessment management, and access to learning resources. These findings became the basis for designing differentiated mentoring strategies

tailored to the specific needs and potentials of each student. Mentoring for MIPA graduates was primarily focused on instructional planning and classroom implementation, while mentoring for FKIP graduates emphasized conceptual depth and pedagogical reasoning.

Listening Stage

The Listening stage served as the core of mindful mentoring by providing a dialogical space for students to express their experiences, challenges, and expectations. Reflective dialogues revealed that many MIPA graduates perceived a gap between their strong content knowledge and their ability to teach mathematics meaningfully in school contexts. Students reported difficulties in connecting pedagogical theories with classroom practice and expressed a need for a “bridge” between mathematical theory and instructional application.

During these reflective sessions, students articulated their aspirations to become more confident and conscious educators who could deliver mathematics lessons in meaningful, engaging, and student-centered ways. The mentoring process at this stage emphasized empathetic listening rather than direct correction. This approach allowed underlying needs to emerge, particularly the need to build teaching confidence and classroom management skills.

The Listening stage supported students’ self-awareness and aligned with principles of mindful learning, where individuals are encouraged to be fully present, reflective, and open to professional growth. At this stage, the mentor acted as a facilitator who guided students in recognizing their own strengths and challenges before progressing to deeper exploration.

Exploration Stage

The Exploration stage represented a collaborative learning phase between the mentor and students. Students were engaged in observing classroom practices conducted by mentor teachers and other mathematics teachers at SMP Global Madani. These observations enabled students to gain diverse perspectives on instructional strategies, classroom interaction management, and formative assessment practices. Observations were conducted using structured observation instruments focusing on lesson openings, classroom interaction patterns, and assessment strategies. In addition, students observed the characteristics of learners in the classes they would teach and conducted interviews with homeroom teachers and school counselors to better understand students’ academic and socio-emotional profiles.

Based on these exploratory activities, students developed lesson plans aligned with innovative instructional models such as Problem-Based Learning, Project-Based Learning, Discovery Learning, Teaching at the Right Level (TaRL), and Culturally Responsive Teaching (CRT). Lesson planning was carried out collaboratively through discussions involving the mentor teacher, supervising lecturer, and peers. This collaborative process fostered a joyful learning atmosphere, as students felt their ideas and creativity were valued. Rather than merely imitating mentor teachers, students developed their own instructional styles grounded in classroom context and learner characteristics.

Action Stage

The Action stage involved the implementation of the revised lesson plans in authentic classroom settings. Students conducted teaching practices while being observed by mentor teachers, supervising lecturers, and peers. This stage played a critical role in building students’ teaching confidence and professional readiness. During classroom implementation, students encountered real classroom dynamics that required flexibility in instructional strategies, time management, and communication with students. Observations were conducted using formative observation sheets focusing on student engagement, appropriateness of instructional strategies and media, and students’ reflective responses to spontaneous classroom situations. The findings indicate that students gradually demonstrated increased confidence, adaptability, and responsiveness to classroom conditions through repeated teaching practices.

Lesson (Reflection) Stage

The final stage of the IDEAL method emphasized guided reflection as a central component of deep learning. After teaching practice, students participated in reflective discussions facilitated by the mentor teacher. Reflection was framed as a developmental process rather than an evaluative judgment. Through reflective questioning, students identified aspects of their teaching that were successful, moments that were personally meaningful or enjoyable, and areas requiring improvement. Reflections were conducted in small-group forums involving mentor teachers, peers, and supervising lecturers. This collaborative reflection enabled students to recognize their strengths, acknowledge limitations, and formulate strategies for improvement. Reflection was carried out continuously throughout the mentoring process, informing subsequent lesson planning and teaching implementation. This sustained reflective practice supported students' professional growth and reinforced their development as reflective practitioners.

Discussion

The findings of this study demonstrate that the implementation of the IDEAL method provided a structured and reflective framework for mentoring mathematics PPG prospective teachers during the teaching practicum. Framing mentoring as a developmental and dialogical process is consistent with perspectives in teacher education that emphasize professional learning through interaction and reflection rather than supervision alone (Loughran, 2014). In this study, IDEAL-based mentoring supported prospective teachers' professional learning by accommodating differences in academic backgrounds while strengthening reflective awareness and pedagogical confidence throughout the practicum.

At the identification stage, clear distinctions emerged between prospective teachers from FKIP and MIPA backgrounds, particularly in pedagogical competence and content mastery. Prior research has shown that variations in academic preparation influence how prospective teachers approach instructional planning and classroom practice, especially in mathematics education where content knowledge and pedagogy must be closely integrated (Shulman, 1986; Ball et al., 2008). By foregrounding these differences early in the mentoring process, the IDEAL method aligned with mentoring approaches that emphasize diagnosing mentees' prior knowledge and professional needs as a foundation for differentiated support (Feiman-Nemser, 2012). This initial diagnosis enabled mentoring to be responsive rather than generalized.

The listening stage played a critical role in fostering reflective awareness and emotional readiness, particularly among MIPA graduates who reported difficulties in translating strong content knowledge into pedagogical practice. Studies on reflective mentoring highlight that dialogical spaces allowing prospective teachers to articulate concerns contribute to identity formation and professional confidence (Korthagen, 2010). In this study, empathetic listening supported the development of trust within the mentoring relationship, a factor identified in previous research as essential for meaningful reflection and engagement in teacher education contexts (Ambrosetti & Dekkers, 2010; Hobson et al., 2009). Through this process, listening functioned not merely as communication but as a pedagogical strategy that enabled deeper self-understanding.

During the exploration stage, guided classroom observation and collaborative lesson planning facilitated the development of situated pedagogical understanding. Research on practice-based teacher education emphasizes that observing authentic classroom practices, when accompanied by structured reflection, enhances pedagogical reasoning and adaptability (Darling-Hammond et al., 2017). In this study, exploration activities enabled prospective teachers to connect instructional models such as Problem-Based Learning and culturally responsive approaches with actual classroom contexts, reflecting arguments that contextualized pedagogy is central to meaningful teacher learning (OECD, 2019). Collaborative inquiry during this stage further reinforced professional learning through shared interpretation and critique, as suggested by Hudson (2013).

The action stage underscored the importance of authentic teaching practice in strengthening professional confidence and instructional flexibility. Experiential learning theory suggests that professional competence develops through iterative cycles of action and reflection within real-world contexts (Schön, 1983). Consistent with this view, the findings show that repeated teaching practice allowed prospective teachers to respond more adaptively to classroom dynamics and instructional challenges. The presence of formative observation during this stage supported reflective adjustment, aligning with evidence that formative feedback plays a key role in improving teaching quality and reflective practice (Hattie, 2012).

The lesson (reflection) stage functioned as the central mechanism for consolidating learning across the mentoring process. Reflection has long been recognized as a core element of professional learning in teacher education, particularly when it is guided and collaborative rather than evaluative (Loughran, 2014). In this study, reflective discussions enabled prospective teachers to critically examine their teaching experiences while constructing shared professional meaning, a process that Feiman-Nemser (2012) identifies as essential for developing teachers as continuous learners. By embedding reflection as a recurring practice, the IDEAL method supported sustained professional growth across mentoring cycles.

Overall, the findings indicate that the IDEAL method integrates identification, dialogue, exploration, action, and reflection into a coherent mentoring process grounded in reflective and experiential learning principles. This structure aligns with existing research on effective mentoring in teacher education while providing an empirically grounded illustration of how stage-based mentoring can be enacted within the PPG practicum context. Through this integration, IDEAL-based mentoring supported holistic professional development by connecting pedagogical knowledge, content understanding, and reflective practice within authentic teaching experiences.

IMPLICATIONS

The findings of this study imply that the IDEAL method can function as a structured and reflective mentoring framework that supports the professional development of PPG prospective teachers, particularly in contexts characterized by diverse academic backgrounds. By integrating identification, dialogical listening, collaborative exploration, authentic action, and guided reflection, IDEAL-based mentoring facilitates the alignment of pedagogical knowledge, content mastery, and reflective practice within real classroom settings. These implications highlight the potential of structured reflective mentoring to strengthen mentoring quality in teacher professional education programs, especially in promoting deep learning, pedagogical awareness, and professional confidence among prospective teachers during teaching practicums.

LIMITATIONS

Despite its contributions, this study has several limitations that should be considered when interpreting the findings. The research was conducted within a single school context and involved a limited number of mathematics PPG prospective teachers, which may constrain the generalizability of the results to other subjects, institutions, or educational settings. In addition, the qualitative and reflective nature of the study emphasizes depth of understanding rather than measurement of causal relationships or long-term impacts. The researcher's dual role as mentor and researcher, while providing rich contextual insights, may also introduce subjectivity, despite efforts to maintain reflexivity and data triangulation.

SUGGESTIONS

Based on the findings and limitations of this study, future research is suggested to examine the implementation of the IDEAL method across broader contexts, involving multiple schools, subject areas, and mentoring arrangements to enhance the robustness of the findings. Longitudinal studies could further explore how IDEAL-based mentoring influences prospective teachers' professional development

over time. Additionally, future studies may integrate complementary quantitative measures to examine changes in mentoring skills, pedagogical competence, or teaching self-efficacy, thereby providing a more comprehensive understanding of the effectiveness of the IDEAL mentoring framework.

CONCLUSION

This study concludes that the IDEAL method provides an effective and coherent mentoring framework for supporting the professional development of mathematics PPG prospective teachers during the teaching practicum. Through its structured stages of Identification, Listening, Exploration, Action, and Lesson (Reflection), IDEAL-based mentoring accommodates diverse academic backgrounds while fostering reflective awareness, pedagogical confidence, and professional growth. The findings demonstrate that mentoring grounded in dialogical interaction, experiential learning, and sustained reflection enables prospective teachers to meaningfully integrate pedagogical knowledge, content understanding, and classroom practice. Overall, the IDEAL method offers a reflective and systematic approach to mentoring that aligns with the principles of deep learning and supports the development of prospective teachers as reflective practitioners.

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AUTHOR CONTRIBUTIONS STATEMENT

Author 1 was responsible for conceptualizing the study, designing the research methodology, conducting the mentoring process, collecting and analyzing the data, and preparing the initial draft of the manuscript. Author 2 contributed to refining the research design, supporting data interpretation, reviewing and revising the manuscript, and providing critical feedback to enhance the clarity, coherence, and academic quality of the article. All authors have read and approved the final version of the manuscript.

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