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Research articles

Implementation of flipped problem-based learning: A reflective practice in mathematics microteaching program

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Abstrak Praktik reflektif merupakan salah satu aspek utama pengembangan kompetensi profesional calon guru matematika. Praktik reflektif melibatkan proses evaluasi diri, pembelajaran berkelanjutan, dan adaptasi terhadap perubahan, yaitu kemampuan untuk beradaptasi dengan kurikulum yang dinamis. Penelitian ini bertujuan untuk memberikan gambaran umum tentang praktik reflektif calon guru matematika yang menggunakan Flipped Problem-Based Learning (FPBL) dalam pengajaran mikro dan bagaimana hasil refleksi mereka terhadap praktik tersebut. Penelitian ini menggunakan pendekatan kualitatif deskriptif dengan melibatkan satu kelas pengajaran mikro yang terdiri dari 13 mahasiswa pendidikan matematika. Data dikumpulkan melalui observasi untuk mengetahui sejauh mana model FPBL memfasilitasi praktik reflektif mahasiswa. Wawancara dan kuesioner reflektif digunakan untuk memperoleh hasil refleksi mahasiswa selama pengajaran mikro. Hasil penelitian menunjukkan bahwa model FPBL memberikan mahasiswa kesempatan untuk meningkatkan praktik reflektif mereka. Mahasiswa diharuskan untuk memulai praktik reflektif mereka sejak awal perencanaan pembelajaran, selama pembelajaran, dan setelah pembelajaran. Hasil refleksi yang paling sering diidentifikasi meliputi penentuan tujuan pembelajaran, perangkat pembelajaran, penerapan strategi pengajaran, dan evaluasi pembelajaran. Studi ini memberikan gambaran umum tentang praktik reflektif calon guru dalam pengajaran mikro dan pertimbangan berharga untuk merencanakan praktik reflektif dalam pengajaran mikro.

Kata kunci *Pembelajaran berbasis masalah, Pengajaran mikro, Praktik reflektif*

Abstract Reflective practice is one of the main aspects for developing the professional competence of prospective mathematics teachers. Reflective practice involves a process of self-evaluation, continuous learning, and adaptation to change, i.e., the ability to adapt to the dynamic curriculum. This study aims to provide an overview of the reflective practices of prospective mathematics teachers who employ the Flipped Problem Based Learning (FPBL) in microteaching and how the results of their reflections on their practices. The study employs a descriptive qualitative approach which involves one microteaching class of mathematics education program consisting of 13 students. Data was collected through observation to determine the extent to which the FPBL model facilitated students' reflective practices. Interviews and reflective questionnaires were used to obtain the results of students' reflections during microteaching. The research results show that the FPBL model provides students with opportunities to enhance their reflective practice. Students are required to begin their reflective practice from the beginning of lesson planning, during, and after learning. The most frequently identified reflection outcomes include determining learning objectives, learning tools, implementing teaching strategies, and evaluating learning. This study provides an overview of prospective teachers' reflective practices in microteaching and valuable considerations for planning reflective practices in microteaching.

Keywords *Problem-based learning, Microteaching, Reflective practice*

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Introduction

The dynamic curriculum in Indonesia (Soleman, 2020) requires teachers and prospective teachers to continuously adapt to ongoing educational changes. The current curriculum grants teachers' greater autonomy to design learning that aligns with students' needs, thereby demanding stronger professional readiness. To respond to these demands, prospective teachers must not only master pedagogical, professional, social, and personality competencies, but also develop the capacity to become lifelong learners. Reflective practice is widely recognized as a key component of lifelong learning (Aldegether, 2020) and plays a crucial role in shaping teacher professionalism. Consequently, reflective practice must be systematically fostered within teacher education programs.

One course that directly supports the development of reflective practice is microteaching, particularly within mathematics education programs. Microteaching provides prospective teachers with structured opportunities to plan, implement, and evaluate learning in a controlled environment. Research indicates that microteaching promotes self-reflection and professional development among prospective teachers (Park, 2021), contributes positively to students' cognitive development (Ilhan et al., 2023), and plays an important role in equipping prospective teachers with essential professional competencies (Ambarini et al., 2023; Faisal et al., 2024). These findings highlight microteaching as a strategic space for cultivating reflective practice.

Despite its potential, microteaching places complex demands on students. Prospective teachers are required to integrate pedagogical knowledge with basic teaching skills, including the use of learning strategies, instructional media, communication skills, classroom management, time management, and mastery of subject matter. Microteaching is designed to train these skills through repeated practice of specific teaching components (Paggara et al., 2020). However, given the dynamic curriculum and the breadth of competencies expected, teaching practice alone is insufficient. Students also require adequate preparation before practice, such as updating curriculum knowledge and identifying essential yet difficult-to-teach content. In practice, limited class time and large student numbers constrain opportunities for in-depth preparation and reflection.

Teaching practice cycles in microteaching consisting of performance, feedback from peers and lecturers, and reflection have been shown to enhance teaching performance, self-awareness, confidence, and professional growth (Monika & Suganthan, 2024). Nevertheless, the effectiveness of reflective practice in microteaching is strongly influenced by the learning setting used. Previous studies recommend further exploration of instructional models that can better support reflection and collaboration among prospective teachers. Microteaching has been implemented using online platforms such as Zoom and Google Classroom (Ariany et al., 2023; Buttler & Scheurer, 2023) and hybrid learning formats (Faisal et al., 2024). Flipped learning has also been recommended because it allows conceptual material to be delivered prior to class (Marlina et al., 2023). However, providing pre-class material alone does not sufficiently address instructional problems encountered during teaching practice, indicating the need for a learning model that actively facilitates problem-solving and reflection.

Problem-Based Learning (PBL) is a well-established model in higher education that emphasizes collaborative problem-solving, active participation, confidence in expressing ideas, and openness to diverse perspectives (Loyens et al., 2015). PBL also encourages students to independently seek information and construct knowledge (Thi et al., 2025). Nevertheless, when applied independently, PBL does not fully optimize instructional time or systematically support

reflective practice in microteaching contexts. This limitation has led to the development of integrative models such as Flipped Problem-Based Learning (FPBL).

Flipped Problem-Based Learning (FPBL) integrates flipped learning and PBL into three phases: before class, during class, and after class (Ariany, 2024). The before class phase is conducted online, enabling students to upload teaching modules and receive lecturer feedback prior to teaching practice. This phase strengthens conceptual understanding, which enhances student engagement during learning activities (Fasco et al., 2024). The during class phase focuses on face-to-face teaching practice, allowing instructional time to be optimized. The after-class phase facilitates continued reflection after learning activities. Previous studies indicate that FPBL positively impacts student learning, particularly in improving reflective abilities (Surya et al., 2025).

Reflective practice has been extensively discussed in the literature (Marlina et al., 2023). However, studies that specifically examine reflective practice among prospective mathematics teachers, particularly through the implementation of FPBL in microteaching courses, remain limited. Therefore, this study aims to analyze how the implementation of the FPBL model in microteaching promotes reflective practice and to describe the reflective outcomes of mathematics education students. The findings are expected to contribute empirical evidence on the role of FPBL in enhancing reflective practice and teaching skills among prospective mathematics teachers.

Methods

This study employed a qualitative descriptive research design to provide an in-depth account of students' reflective practices in microteaching courses implemented through the FPBL learning model. A qualitative descriptive design was chosen because the study seeks to examine prospective teachers' reflective practices as context-dependent and experience-based processes within FPBL-based microteaching. Reflective practice involves personal meaning-making, self-evaluation, and instructional interpretation that cannot be adequately represented through quantitative measures alone. A qualitative approach allows these reflective processes to be captured as they naturally occur, providing rich and authentic insights into how prospective mathematics teachers engage in reflection throughout planning, implementation, and evaluation stages of teaching.

The participants are undergraduate students of mathematics education program in Universitas Islam Negeri Sunan Gunung Djati, Bandung, Indonesia. They were selected using purposive sampling from ten microteaching classes offered in the second term of the 2024/2025 academic year. This sampling strategy was applied to ensure the inclusion of participants who met specific criteria relevant to the research objectives and were capable of providing rich, contextually grounded data. The selected class reflected key characteristics of the microteaching student population, including regular enrollment status and adequate access to learning facilities that supported full participation in hybrid (flipped learning) instructional activities. Furthermore, due to the participatory nature of the observation, the selected class was directly taught by the researcher, enabling sustained engagement and continuous observation throughout the instructional process.

Class selection was primarily based on preliminary teaching performance assessments conducted prior to data collection. The average teaching performance scores of students in the selected class ranged from 61 to 80, corresponding to a "good" performance category and

aligning with the overall average teaching performance of students enrolled in microteaching courses. These scores were derived from systematic observations of students' teaching performance conducted before the implementation of the research intervention.

Teaching performance was assessed using an observation rubric adapted from the indicators proposed by (Zahid & Khanam, 2019). The observed dimensions included: (1) lesson planning; (2) brainstorming activities; (3) instructional activities; (4) extended work; (5) classroom and instructional time management; (6) conceptual understanding; (7) communication skills; (8) assessment and evaluation; and (9) feedback. Collectively, these indicators provided a comprehensive framework for evaluating students' baseline teaching skills.

One microteaching class that met all established criteria was selected as the research setting, consisting of 13 students (12 female and one male). The decision to focus on a single class was intentional, as it allowed for a more detailed and in-depth examination of students' reflective practices within a specific instructional context. This approach is consistent with the epistemological orientation of qualitative research, which prioritizes depth of understanding and data richness over statistical representativeness.

Data were collected through participatory observation, semi-structured interviews, and a reflective practice questionnaire. Participatory observation was employed to directly examine students' reflective practices during FPBL-based microteaching sessions, allowing the researcher to be actively involved while continuously observing the instructional process. Semi-structured interviews were conducted to explore students' independent reflections on their teaching experiences in a more in-depth and exploratory manner, thereby providing a comprehensive understanding of their reflective processes.

The reflective practice questionnaire was designed using a four-point Likert scale to capture students' reflections at the stages of lesson planning, instructional implementation, and learning evaluation. Respondents were asked to indicate their level of agreement with each statement using the following scale: 4 = almost always, 3 = regularly, 2 = situationally, and 1 = rarely. The questionnaire was developed based on the Reflective Thinking Attribute (RTA) framework proposed by Taggart & Wilson (2005), which cocprises four key indicators: reflection when confronted with a problem, reflection during lesson preparation, reflection during instructional implementation, and reflection during learning assessment and evaluation. All research instruments underwent expert review and validation by mathematics education scholars from several universities to ensure content validity and methodological rigor. The results of expert validation can be seen in Table 1.

Table 1. Instrument validation results

Instrument validation	Score					
	Validator 1	Institution	Validator 2	Institution	Validator 3	Institution
Observation Sheet	4.00	IPI	3.75	UNPAS	3.625	UIN SGD
Interview question	4.00	IPI	3.85	UNPAS	3.57	UIN SGD
Reflective questionnaire	4.00	IPI	3.85	UIN SGD	3.2	UKRI

Validator responses were collected using a validation sheet with a scale of 1–4. The average validation results from experts from four different universities indicated that the instrument was

suitable for use in research. Participatory observations were conducted continuously throughout 15 microteaching sessions. Observations were carried out at each meeting by examining students' teaching skills based on indicators specified in the official guidelines of the faculty microteaching unit. The focus of the observation encompassed the entire sequence of students' teaching practice, including lesson planning, instructional implementation from the introductory and core activities to the closing phase. Data were recorded using observation sheets and field notes developed in accordance with the official assessment rubric of the faculty microteaching unit, ensuring a systematic and consistent observation process.

Meanwhile, the reflective practice questionnaire was administered once at the end of the microteaching course to capture students' overall reflective practices. The sequence of research procedures is presented in Figure 1.

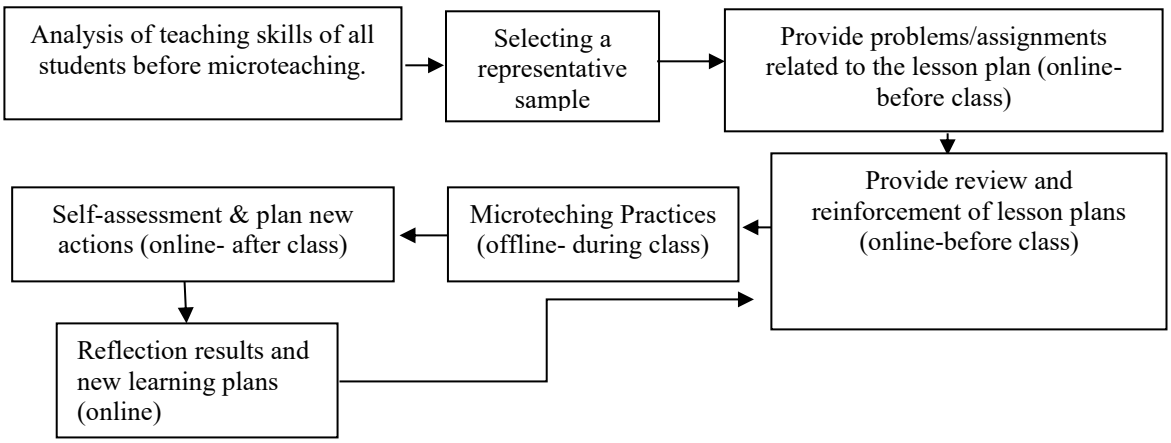

Figure 1. Research flow

The collected data were then analyzed using analytical stages adapted from Braun & Clarke (2006), which are as follows: (1) Transcribe data, write it down and read it repeatedly to understand the data; (2) Creating initial codes, researchers label data deemed meaningful; (3) Grouping codes into potential themes; (4) Reviewing themes, rechecking codes and their classifications to ensure validity; (5) Defining themes; and (6) Creating reports, presenting analysis results, and drawing conclusions

Findings and Discussion

In line with the objectives of this study, the results are presented in two parts. The first part describes students' reflective practices during microteaching lectures using the FPBL model. The second part explains the outcomes of students' reflections throughout the microteaching process.

Implementation of FPBL model

This study follows the FPBL learning model steps adapted from Ariany (2024), as outlined in Table 2.

Table 2. FPBL steps in microteaching class

Phase	Before class	During class	After class
Activities: 1. Check Knowledge 2. Check Understanding 3. Study 4. Summarize	Make a learning plan according to the knowledge and understanding you have, watch learning videos/study the material provided, make notes, create teaching modules that will be used in teaching practice.	Problem Based Activities: Co-constructing knowledge & professional action with teaching practice	Self-Assessment & Plan New Actions Create a revised learning plan including its tools, analyze the results of independent reflection and comments from colleagues/instructors.
Assessment	Collected at the specified time and bring a copy to class.	The instructor monitors, clarifies concepts, provides necessary suggestions.	New lesson plans are collected at the specified time.

The learning steps in the FPBL model provide a cycle of reflection and continuous improvement, which is expected to significantly enhance students' teaching skills. Analysis of reflective practice in the FPBL model to find out the extent to which the FPBL model facilitates students to carry out reflective practice related to microteaching lectures, and the results of their reflections will describe the extent to which reflective practice is useful for improving the teaching skills of prospective mathematics teacher students.

Reflective practice in the FPBL model

The analysis of students' reflective practices during the microteaching course using the FPBL model showed that students actively engaged in all phases—before class, during class, and after class—demonstrating both reflection-in-action and reflection-on-action.

1. Before class phase: Students uploaded their teaching modules and received feedback from lecturers. Most students revised their modules promptly, showing that they were able to anticipate potential challenges during face-to-face teaching.
2. During class phase: Observations revealed that students who performed teaching practice demonstrated high levels of professional engagement, applied their planned teaching strategies effectively, and incorporated immediate reflections when unexpected issues arose. Peer feedback during this phase also contributed positively to the refinement of teaching practices.
3. After class phase: Students completed self-assessment questionnaires and planned revised teaching modules. The analysis of these reflections indicated that students identified specific strengths and weaknesses in their teaching practice and proposed actionable improvements for future lessons.

Overall, the average implementation of reflective practices across all phases was high. Students consistently demonstrated the ability to critically assess their own teaching and make adjustments based on both self-assessment and peer/lecturer feedback. Because peers in microteaching classes play a crucial role in teacher success (Marlina, 2023; Erdemir, 2021;

Karlsson, 2020). In accordance with Schön's reflection model, reflective practice during teaching practicum encompasses reflection-in-action. During practicum, students engage in reflection by considering the situation, determining appropriate actions, and promptly implementing them. This reflective practice is of paramount importance for students, as it not only facilitates the review of their actions but also encourages critical thinking while taking action (Tan, 2020). These findings indicate that the FPBL model effectively promotes reflective practice. practice, contributing to the development of professional teaching competencies in prospective mathematics teachers.

Plan new actions is the closing activity in the after-class phase, as well as the closing of all phases in the FPBL learning model. In the plan new actions step, students establish a plan to improve the results of the reflection on the teaching practice that has been carried out by compiling a new learning plan along with its learning tools. The results of the reflection as a whole are applied in this learning stage. This stage is in accordance with the definition expressed by Schon that reflective practice is a dialogue between thinking and acting that makes someone more skilled (Tan, 2020).

In the implementation of the FPBL model, students have the opportunity to conduct independent evaluations both during learning and after microteaching practice. Their awareness of aspects that require improvement as well as those that should be maintained emerges strongly through reflection on their experiences and actions. Students demonstrate a more comprehensive understanding of their strengths and weaknesses, which can serve as a foundation for improvements in subsequent actions (see Figure 2).

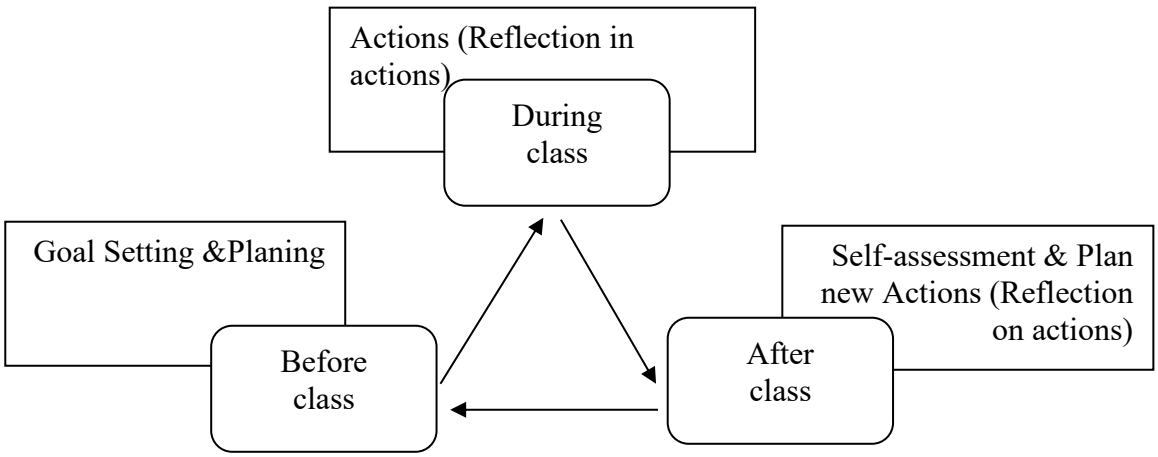

Figure 2. Reflection cycle in the FPBL learning model

The average level of student activity implementation during the application of the FPBL model reached 92.3%, indicating that student activities in FPBL were implemented very well. This percentage was obtained through observations of student participation using an observation sheet consisting of 22 statements, with each statement representing student activities across the phases of the FPBL model. The observation results show that most of the planned activities were carried out optimally. In addition, students demonstrated positive engagement in reflective practice throughout the microteaching process. These findings are consistent with the study by Marlina and Sri (2024), which reported positive student engagement in reflective practice within microteaching classes.

In this study, starting from the before-class phase, students uploaded their teaching modules and were given notes for improvements by the lecturer. They responded quickly and accommodated the given feedback, uploading their revisions a maximum of one day before the teaching practice in class. Reflection activities had begun at this stage. In the next phase, namely during class, students engaged in participatory and collaborative learning even though it was not their turn to perform teaching practice. Only four or three students participated in teaching practice at each meeting, and the rest played the role of students at school. Students who had performed then received comments from the lecturer/colleagues regarding their performance in class. Students who had practiced teaching then filled out a self-assessment questionnaire and completed the after-class phase assignments given and collected one day after the lecture in class.

Results of reflections of prospective mathematics teachers during microteaching

Thirteen students were sampled to observe their independent reflections during microteaching through interviews conducted after each practice session. These students were then assigned codes R1 through R13. The results of student reflections during microteaching using FPBL can be summarized into several themes, as follows.

1. Students are aware that several learning objectives have/have not been achieved and can provide relevant evidence regarding the achievement of the objectives that have been set.
   Quote 1
   Yes, the affective objectives have not yet emerged in the learning process. The cognitive and psychomotor objectives have been achieved (defining and drawing vectors). Students are able to differentiate between vectors and scalars. In group discussions, students share roles and help each other solve problems. The results of the exercises show that students can draw vectors and write vector notation correctly. (R1)

   Only the cognitive objectives have been achieved. Students are able to complete the tasks on the student activity sheet. (R 6)

The results of students' reflections are consistent with the review of the learning materials they collected on the day of their teaching practice. Most of the claimed learning objectives, whether achieved or not, were cognitive in nature. Students generally do not plan learning activities to achieve affective and psychomotor objectives, let alone measure them. They focus excessively on cognitive assessment, and authentic assessment involving cognitive, affective, and psychomotor aspects has not yet been implemented. These three aspects should be included in the learning outcome measurement instruments to produce a holistic assessment (Arumugham et al., 2025). Therefore, instructors need to re-emphasize to students the importance of setting learning objectives that encompass cognitive, affective, and psychomotor aspects, as well as how all three aspects are assessed in the learning process.

2. Obstacles experienced by students during teaching practice include limited time (only 20 minutes for each presentation), a gap between the planned material coverage and the available time, and numerous self-errors such as nervousness, lack of confidence, inability to focus, and forgetfulness during teaching.
   Quote 2
   Lack of time due to too much material… (R 5)

Improper time management, resulting in rushed presentations. (R 11)

I was nervous and forgot, and the learning process deviated from the planned teaching module. (R 10)

An unstable projector (displaying teaching materials) distracted the teacher. (R 9)

The challenges were a lack of confidence, poor time management, and some confusion when operating the GeoGebra app. (R 7)

It was right, even though I should have anticipated it from the start. (R7)

It seems not yet; I shortened the confirmation by instructing students to match their answers with their friends. (R13)

Only one student felt his actions during the teaching practice were inappropriate. He realized that rushing the group presentation confirmation session was inappropriate. He should have confirmed several different answers or used a different method for solving the problem, rather than simply matching the answers to the group representative who came forward.

3. Efforts made by students to deal with obstacles that occur during teaching practice include trying to control themselves and continue learning until the time is up even though it does not go according to plan, speeding up the learning process so that all activities can be carried out.
   Quote 3
   I try to take a breath, calm myself, and focus on the main points while explaining. To save time, I speed up discussion sessions and provide direction for those who are having difficulty. (R7)

   I look for ways to return to the original plan by speeding things up or skipping lessons. (R6)

   I deliver material on time, and any missed material is covered in the next meeting. (R5)

   I remain calm and continue the lesson with or without the PowerPoint presentation. (R9)

4. Efforts to improve teaching practices to prevent recurrence of obstacles during teaching. At this stage, students reflect on past teaching practices, evaluating weaknesses and strengths to be used in planning better learning in the future. Reflection on actions is carried out at this stage.
   Quote 4

   Practice teaching extensively according to the learning scenario and manage time according to learning activities. (R11)

   Replan the material to be delivered according to the time available. (R5)

Practice teaching according to the time allocation, review the learning scenario, understand the material thoroughly, and always pray before performing. (R9)

Practice thoroughly and master the material to be presented. (R10)

5. Develop new learning objectives and plans, after identifying weaknesses in previous teaching practices, evaluating what has not been achieved in previous practices, such as learning objectives, learning activities, etc., at this stage, new learning objectives are formulated until a complete plan for the new teaching module is prepared. Students re-arrange their teaching modules, completing learning objectives that include cognitive, affective, and psychomotor objectives. Plan learning activities in more detail and systematically, starting from accommodating all learning steps according to the chosen model to reflection activities in the closing activity. Develop LKPD again according to the chosen model, simplify instructions for easy understanding, complete teaching materials and learning media.
   Quote 5

   The teaching modules will be explained more clearly, and learning objectives will be completed for all domains. Reflection will be conducted… (R3)

   Planning the development of teaching modules that are more innovative and tailored to student needs. Emphasizing teaching modules that encourage active, collaborative learning and meaningful understanding. (R6)

   Simplifying the instructions in the worksheets, adding more illustrations, and providing QR codes for faster GeoGebra access. (R7)

6. Students experienced tremendous benefits from their reflective practice. They recognized that their critical reflection improved not only their teaching skills but also their learning planning and evaluation. Students generally agreed with the comments from both their lecturers and their peers.
   Quote 6

   Yes, it helped me identify weaknesses I wasn't aware of (R7)

   Strongly agree, it broadened my understanding of teaching effectively and developed more operational teaching modules (R8)

   Agree, I will correct my inaccuracies in delivering the material and my assessments in my next performance (R1)

Based on the interview results, the researchers found that students not only benefited from the reflective practice they had undertaken throughout the use of the FPBL model in this microteaching class, but also encountered challenges in conducting reflective practice. The most important of these were difficulties in explicitly expressing the results of their reflections and in articulate theoretical evidence underlying their teaching practices. This is in line with (Glogger-Frey et al., 2018), who noted that beginners in the learning process often struggle to make implicit knowledge explicit. The challenges students face during their teaching practicum are

understandable, given their limited experience and lack of consideration of potential incidents when planning lessons. The students' lack of readiness and classroom management skills, as well as their limited practical experience, are the main factors causing the teaching process to deviate from the plan, including insufficient consideration of potential unforeseen events during lesson planning (Barredo, 2025).

Students were aware of the reasons for their suboptimal practice but were not accustomed to evaluating it independently in the systematic and critical manner required by their current course. Interviews revealed that many students still tended to answer questions briefly without further explanation. Reflective practice was avoided or often ineffective because students were more accustomed to listening to criticism than to reflecting independently and truly evaluating their work. Students did not experience emotional problems with reflective practice, but rather a lack of practice. This contrasts with other studies that suggest that emotional factors are what make novice practitioners uncomfortable during reflection (Marlina & Sri, 2024; Wei Ann et al., 2018).

Students' reflection on their previous teaching practice plays a crucial role in improving the quality of learning. By reflecting on their experiences, students can identify weaknesses, such as ineffective time management or insufficient mastery of the material, while also recognizing their strengths. This aligns with the principles of experiential learning (Kolb, 1984), where reflection on concrete experiences enhances understanding, skills, and decision-making. Thus, critical reflection supports the comprehensive development of students' professional competencies, encompassing cognitive, affective, and psychomotor domains. Although overall, students' reflective practices are positive, strengthening reflective practices for prospective mathematics teachers needs to be more extensive to foster critical reflection on their abilities and encourage the development of even better competencies.

Conclusion

The FPBL model provides space for deeper reflective practice for students. Reflective practice does not only occur after teaching practice is carried out, but long before it has been carried out, by integrating their prior knowledge, experience, with new challenges as teachers in micro-learning. Reflective practice in the FPBL model is an activity that takes place continuously as a cycle. It becomes a kind of laboratory to train students to continuously learn to improve themselves to become professional teachers and build long-life learning. Students can conduct self-assessments and plan new actions in the future by considering various aspects that are supporting factors and obstacles in their teaching practice, so that the ultimate goal is that they can continuously improve their teaching skills and become professional teachers. The results of this study provide valuable insights into how the FPBL model is implemented and its support for reflective practice. However, further research is needed to test the effectiveness of this model on students' teaching skills, focusing on measuring the impact of the FPBL model on improving students' teaching skills. The results of student reflections indicate that they are aware of many shortcomings in planning lessons, which ultimately impact their teaching practice. Therefore, it is necessary to re-examine how they practice in preparing lesson plans. One effort might be to develop a project-based learning model for lesson planning courses so that students are more focused in designing learning tools and are expected to have a complete teaching module output/portfolio for lesson plans that can serve as a model for their future practice.

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