Mapping Reflective Thinking Patterns of Prospective Professional Teachers

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A B S T R A K

Kemampuan refleksi (reflective thinking) menjadi salah satu aspek berpikir penting yang harus dimiliki guru untuk meningkatkan kualitas pembelajaran. Namun, banyak calon guru yang masih kesulitan mengembangkan refleksi mendalam terhadap praktik pembelajarannya. Penelitian ini bertujuan untuk menganalisis pola reflective thinking pada mahasiswa PPG Prajabatan dengan tingkat kognitif C4-C6. Penelitian ini menggunakan pendekatan kualitatif dengan desain Interpretive Phenomenological Analysis. Subjek penelitian ini adalah 36 mahasiswa PPG Prajabatan, yang juga berfungsi sebagai subjek uji coba. Pengumpulan data dilakukan melalui wawancara mendalam dan dokumentasi refleksi mahasiswa menggunakan instrumen pedoman wawancara semi-terstruktur dan lembar analisis refleksi. Analisis data meliputi tahap data managing, reading-memoing, describing-classifying-interpreting, dan representing-visualizing. Hasil penelitian menemukan empat pola reflective thinking, yaitu habitual action, understanding, reflection, dan critical reflection. Setiap pola menunjukkan tingkat kedalaman berpikir dan kesadaran reflektif yang berbeda dalam proses pembelajaran. Simpulan dari penelitian ini adalah terdapat variasi pola reflective thinking di kalangan calon guru yang berimplikasi pada kualitas pengembangan profesional mereka. Implikasi dari penelitian ini menegaskan pentingnya pelatihan dan pembinaan reflective thinking untuk membentuk karakter, kompetensi profesional, serta meningkatkan efektivitas pembelajaran di dunia pendidikan yang terus berkembang.

A B S T R A C T

Reflective thinking is one of the essential cognitive skills that teachers must possess to enhance the quality of teaching. However, many prospective teachers still struggle to develop deep reflection on their teaching practices. This study aims to analyze the patterns of reflective thinking among pre-service teacher education students, with a focus on cognitive levels C4-C6. This research employs a qualitative approach with an Interpretive Phenomenological Analysis design. The subjects of this study are 36 pre-service teacher education students, who also serve as the experimental subjects. Data collection was carried out through in-depth interviews and documentation of students' reflections using semi-structured interview guidelines and reflection analysis sheets. Data analysis followed the stages of data managing, reading-memoing, describing-classifying-interpreting, and representing-visualizing. The findings reveal four patterns of reflective thinking: habitual action, understanding, reflection, and critical reflection. Each pattern represents different levels of depth in thinking and self-awareness during the learning process. The conclusion of this study indicates that there is variation in the reflective thinking patterns among pre-service teachers, which has implications for their professional development. The implications of this research emphasize the importance of training and fostering reflective thinking to shape character, professional competence, and enhance teaching effectiveness in an ever-evolving educational landscape.

1. INTRODUCTION

Teachers are professional figures who strive to instill education and various life skills in students (Akbar, 2021; Carlson, 2019). Teaching is a profession that requires specialized skills and is predicted to remain irreplaceable despite the rapid advancements brought by the industrial revolution (Nuryani & Handayani, 2020; Teo et al., 2021). A teacher must be able to embody professional, pedagogical, social, and personal competencies simultaneously (Akbar, 2021; Alfath et al., 2022; Antera, 2021; Shermukhammadov, 2022). These competencies are essential for shaping students into knowledgeable, skilled, and character-driven individuals. Consequently, the quality of teachers is often considered the key factor in determining the success of future generations.

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Officially, the regulations concerning the professional ethics of teachers are stipulated in Law Number 14 of 2005 on Teachers and Lecturers. The primary duties of a teacher, outlined in Article 1(1), include educating, teaching, guiding, directing, training, assessing, and evaluating students in formal early childhood education, primary education, and secondary education. Furthermore, Article 8 states that teachers must possess academic qualifications, competencies, a teaching certificate, physical and mental health, and the ability to achieve national education goals. This demonstrates that becoming a professional teacher requires specific qualifications and competencies. Consistently, research shows that professional teacher competence includes the ability to master subject matter deeply, understand student characteristics, and design and implement effective teaching strategies. Moreover, sufficient academic qualifications are a prerequisite for teachers to optimally develop their pedagogical and professional competencies (Mustofa, 2020; Situmorang et al., 2022)

Postgraduate education that specifically aims to develop teacher professionalism is known as the Teacher Professional Education (PPG) program. PPG is a program initiated by the government in collaboration with several universities that offer educational study programs (LPTK). Specifically at selected LPTKs, this program prepares teachers and prospective teachers to master teaching competencies comprehensively and meet national standards (Shaukat & Chowdhury, 2020; Shermukhammadov, 2022; Situmorang et al., 2022). The goal of this program is to create educational personnel capable of conducting research and continuously developing their professionalism (Setyorini & Sukirman, 2020; Shaukat & Chowdhury, 2020). In practice, the education sector continuously presents new challenges for teachers over time. Some of these challenges include digitalization, differentiated learning, the need for engaging teaching strategies to avoid monotony, and the ever-expanding duties of teachers. Addressing such challenges would be nearly impossible without good competencies and thinking skills. Good thinking abilities help teachers complete tasks, solve problems in life, and foster creativity and innovation in the learning process (Calavia et al., 2021; Kwangmuang et al., 2021).

One of the crucial thinking skills that teachers must possess is reflective thinking. This skill involves correlating existing knowledge to solve new problems related to their own knowledge (Akpur, 2020; Colomer et al., 2020). Reflective thinking skills are linked to all four teacher competencies as they correlate with the ability to identify weaknesses in instructional design (professional competence), address students' dynamic needs (pedagogical competence), apply intrapersonal intelligence in teaching (personal competence), and engage various stakeholders to achieve learning objectives (social competence). When teachers are capable of evaluating weaknesses in these areas, the learning process can continuously improve (Carlson, 2019; Cheng, 2021; Latipah et al., 2022; Nugraha et al., 2020; Tampubolon, 2020). Reflective thinking is a high-level thinking skill. In general, its components include reacting, elaborating, and reflecting (Orakçı, 2021; Yaacob et al., 2020). Throughout this process, reflective thinking involves logical reasoning, process analysis, and problem-solving (Akpur, 2020; Liu et al., 2023). Thus, with this ability, prospective professional teachers can understand, critique, evaluate, seek alternative solutions, and assess problems in the learning process (Colomer et al., 2020; Korthagen & Nuijten, 2022). Furthermore, this skill is highly potential in helping solve the various challenges teachers face by optimizing past experiences to make more solution-oriented decisions.

Through this series of processes, reflective thinking can influence individuals to be more thorough, critical, and careful in solving problems. This thinking ability is also effective in helping the brain determine the best, easiest, and fastest solution to a problem. Essentially, this ability can also have a continuous impact on teachers' performance. This is because it has the capacity to identify past mistakes, thereby making it easier to find appropriate teaching strategies for students over time (Manurung & Listiani, 2020; Neubauer et al., 2019). Based on the ideal conditions expected, PPG (Pre-Service Teacher Professional Education) students need to possess a well-developed reflective mindset in order to continuously develop their professionalism and be prepared to face the ever-changing challenges of the education world. However, in reality, observations and several studies, such as those conducted by other researchers, indicate that the reflective thinking skills of PPG students still vary and are not yet optimal. Students tend to describe their experiences without conducting an in-depth analysis of the shortcomings and necessary improvements (Nugraha et al., 2020; Tampubolon, 2020). This shows a gap between the expectations and reality between the need for strong reflective thinking skills and the weak reflective capacity of PPG students.

To bridge this gap, a development solution is needed in the form of an analysis of the reflective thinking patterns of PPG Pre-Service students, in order to understand the stages of reflection they undertake and to find strategies to strengthen this ability. Previous studies have examined the importance of reflective thinking in enhancing teacher professionalism; however, this study offers novelty by specifically focusing on the reflective thinking patterns of PPG Pre-Service students. Through this, more appropriate learning and reflective training strategies tailored to the characteristics of today's prospective teachers can be discovered (Orakçı, 2021; Setyorini & Sukirman, 2020). The urgency of this research is very

high, considering that reflective thinking forms an essential foundation for developing teachers who are adaptive, innovative, and ready to face dynamic changes in the field of education. By uncovering the patterns of reflection that develop during the PPG process, this study is expected to contribute to the development of more supportive learning models and curricula that encourage critical reflection. More specifically, this study aims to analyze the reflective thinking patterns that develop among PPG Pre-Service students by mapping the stages of reflection they engage in, identifying the challenges they face in performing reflection, and discovering effective strategies to enhance the effectiveness of their learning and professional development. The results of this study are expected to serve as the basis for developing strategies to strengthen reflective thinking patterns within the PPG curriculum and make a tangible contribution to producing reflective, innovative, and competent teachers who are prepared to face global challenges.

2. METHOD

This study applies qualitative research using the Interpretive Phenomenological Analysis approach. One type of phenomenological research aims to interpret and interpret a phenomenon based on human experience (Neubauer et al., 2019; Nugraha et al., 2020). The main keywords are phenomenology and hermeneutics which focus on a person's experience. In accordance with explanation regarding the need to combine the study of experience and the study of meaning and meaning with that experience because they complement each other. This type of research was chosen to reveal the variety of meanings and describe the reflective thinking of PPG Prajabatan UM students. This study involved 36 students of PGSD PPG Prajabatan at LPTK Universitas Negeri Malang. The subjects of this study were selected using purposive sampling technique by adjusting the class that was implementing the Principles of Effective Teaching and Assessment I course. This study uses two main instruments that have been validated by validators to collect the data needed, such as worksheets on reflection activities, planning and implementation of learning practices, and semi-structured clinical interview guidelines to explore the reflective thinking of students (Sukmawati & Tarmizi, 2022; Zakariah et al., 2020). This worksheet will integrate the components of reflective thinking, namely reacting, elaborating, and contemplating. This data collection was carried out through filling out a worksheet containing reflection activities after the assignment of compiling the design of learning tools and the implementation of learning practices in the subject of Effective Teaching and Assessment Principles I. Furthermore, the data was completed by conducting interviews with students.

The data analysis techniques used in this study namely data managing, reading-memoing, describing-classifying-interpreting, and representing-visualizing. Data managing involves organizing data into computer files for analysis, transcribing student recordings and interviews, and typing observation notes to ensure systematic documentation. Reading-memoing refers to the process of reviewing and interpreting the collected data while providing notes or memos on the edges of field notes, transcripts, or beneath photos to facilitate the initial exploration of data. Describing-classifying-interpreting focuses on forming codes or categories that represent the essence of data analysis. In this stage, researchers construct detailed descriptions, develop themes or dimensions, and offer interpretations based on their perspectives or relevant literature. Finally, representing-visualizing is the stage where the results of data analysis are presented in various forms, such as text, tables, or images, to enhance clarity and comprehensibility.

3. RESULT AND DISCUSSION

Result

The distribution of respondents came from professional level students, namely the Pre-Service Teacher Professional Education (PPG) PGSD at the State University of Malang, amount to 29 respondents. PPG PGSD students are prospective elementary school teachers who are taking education towards being professional, so they can be said to be prospective professional teachers. Based on the results of the data obtained regarding the pattern of reflective thinking in carrying out learning by prospective professional teachers, Figure 1 can be described the distribution of the level of reflective thinking of prospective professional teachers.

The achievement of reflective thinking by respondents at the synthesis level is still low, which is 17.24%. This fact indicates that the ability to think reflectively in learning by respondents is not optimal. Respondents understand what mistakes and shortcomings are made during learning, starting from planning to evaluating learning, but have not been able to connect the results of their understanding with the follow-up plan that will be carried out in the next learning. To get an overview of the reflective thinking abilities of respondents in each category as presented in Table 1.
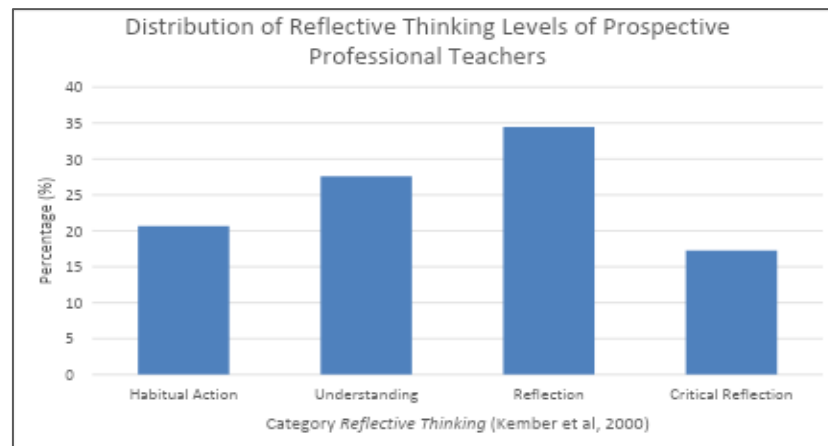
Figure 1. Distribution of Reflective Thinking Levels of Prospective Professional Teachers

Table 1. Distribution of Respondents' Reflective Thinking Identification

Category	Identification of Respondents
Habitual Action	R-4, R-6, R-11, R-16, R-17, R-29
Understanding	R-2, R-5, R-7, R-22, R-23, R-24, R-27, R-28
Reflection	R-1, R-3, R-10, R-14, R-15, R-18, R-19, R-20, R-21, R-25
Critical Reflection	R-8, R-9, R-12, R-13, R-26

To get a deeper picture of the respondents' reflective thinking ability in each category as presented in table 1, R-4 and R-16 were selected (in the habitual action category), R-5 and R-22 (in the understanding category), R-1 and R-25 (in the reflection category), R-8 and R-13 (in the critical reflection category. In the first indicator, namely reacting, which can be observed overall based on the respondents' initial responses based on their personal understanding by focusing on natural situations such as identifying learning that has been done previously. Reacting is measured based on four things, namely formulating problems in previous learning, identifying concepts/aspects related to the given problem, clarifying difficulties that occur when solving problems that have the same context as certain aspects, and formulating a solution design. This can be known before respondents prepare the learning plan that will be carried out. The characteristics of the answers for the first indicator are presented in Table 2.

Table 2. Characteristics of Respondents' Answers for the First Indicator

Respondent Group	Reacting
Habitual Action	Respondents' answers tend to be based on automatic actions taken without in-depth analysis or re-evaluation. Respondents immediately provide answers that have been done many times before without considering new contexts or changes in the situation.
Understanding	Respondents demonstrate an understanding of previously identified learning problems. Respondents can relate these problems to learning planning, although not in depth.
Reflection	Respondents reflect on experiences and solutions that have been used in previous learning. Respondents try to understand challenges or difficulties and can find ways to improve their approach or strategy.
Critical Reflection	Respondents critically question assumptions used in previous learning. Respondents reformulate their way of thinking and try to find better solutions based on deeper and more critical thinking.

Based on Table 2, it can be concluded that the habitual action category is the shallowest because it only focuses on habits. While critical reflection is the deepest because it involves critical evaluation and changes in thinking. In terms of approaching problems that have been experienced, habitual action involves repeated actions, understanding involves identifying concepts, reflection involves evaluating experiences, and critical reflection involves fundamental changes in thinking. This can be seen based on the results of in-depth interviews and observations of learning devices in the analysis and mapping sections. The following is an excerpt from respondents' answers to the reacting indicator presented in Table 3.

Table 3. Respondent's Answer Excerpt on Reacting

| Habitual Action		Understanding		Reflection		Critical Reflection	
R4	"In the previous lesson, there were still many students who lacked confidence, so I always made simple presentations like before."	R5	"There were students who were not focused and tried to leave the class, so it seems I need to make more class rules and agreements before the lesson."	R1	"When implementing the lesson, I lacked confidence and was nervous. The media I used was only one type, namely learning videos. There were students who said they didn't like it, so in the next lesson I need to provide more diverse media."	R8	"The learning that was carried out was almost according to plan. There was poor student cooperation behavior because they felt their friends were not able to do it. I plan to create a group pattern with varied mapping according to the learning material"
R16	"The learning that I have done, I think is good, but as usual some children are less active, but they are indeed introverted children."	R22	"I have not given feedback to students at the end of the lesson, I often forget, so in the future I will probably note it in the presentation."	R25	"In my opinion, the students don't really understand. I tried to ask at the end of the lesson, it seemed that the learning media was not very concrete, and the order of the learning materials needed to be readjusted."	R13	"The answers from the students were diverse during the evaluation and beyond expectations because their imagination and knowledge were also different. I suspect that the students' understanding of the material I teach is different, so I need to analyze and further map the students who are fast, medium, and slow learners. After that I will implement peer tutoring learning. "In previous learning, there are lots students who are lacking of self-confidence, so that I am always to make simple presentation as before."

In the second indicator, namely comparing, overall, it can be observed based on the relationship between the learning plan prepared by the teacher with the experience and knowledge that the teacher has previously obtained, including in the reacting stage. Comparing can be measured based on four things, namely specifically identifying aspects of learning and the relationship of these aspects contained in the problems presented, making connections with the learning to be carried out, wisely considering the strategies set in learning, and estimating the impacts that occur. This can be known before the respondent prepares the learning plan to be carried out. The characteristics of the answers for the first indicator are presented in Table 4.

Table 4. Characteristics of Respondents' Answers for the Second Indicator

Respondent Group	Comparing
Habitual Action	The learning plan that was prepared did not include needs mapping and tended to show learning that was already being done.
Understanding	Respondents wrote down the results of mapping from previously found problems, but this was only included in writing and was not integrated into the learning steps.
Reflection	Respondents carried out mapping and integrated it into the learning steps, so that one group of students was given different treatment and/or adjusted to the results of the previous experience evaluation.
Critical Reflection	Respondents critically and in detail planned learning based on previous experiences, and arrived at the learning evaluation, so that a follow-up plan was also prepared for the next meeting.

Based on Table 4, it can be concluded that in the habitual action category, needs analysis and mapping are not carried out. In other categories, needs analysis and mapping are carried out, but what makes it different is the depth of integration in the learning planning that will be carried out. The critical reflection category carries out the deepest integration of needs mapping, namely up to the evaluation of learning and follow-up plans that will be carried out in the next learning. Learning planning is arranged in the form of teaching modules, adjusted to the applicable curriculum format, namely the independent curriculum. Planning is made so that prospective teachers can be better prepared to carry out learning by reflecting on the knowledge they have and the experiences they have had in previous learning. Then, planning also determines the follow-up plan that will be carried out by prospective teachers in learning. A more detailed explanation of lesson planning is presented in Figure 2.

| (a) | (b) | (c) |
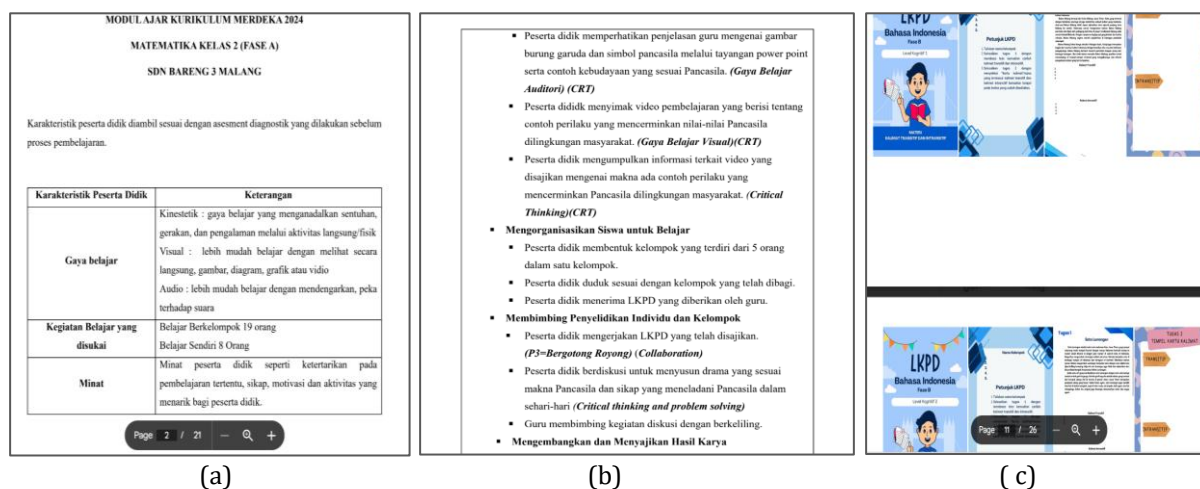
Figure 2. Snippets of Teaching Modules (a) Understanding (R22), (b) Reflection (R25), (c) Critical Reflection (R13)

In the third indicator, namely contemplating, it can be observed based on learning practices and reflection questionnaires after the implementation of learning. At the contemplating stage, a prospective teacher deeply rethinks his/her learning experience. This stage is very crucial because it allows prospective teachers to dig deeper into the meaning of the experience, and identify areas that need to be improved. Contemplating in the context of reflective thinking of prospective professional teachers can be measured based on eight things, namely stating the implementation of the strategy clearly based on a fixed plan, showing wise consideration regarding the steps taken to solve the problem completely with logical and strong reasons, overcoming problems that arise during implementing the solution, commenting on the experience that is owned related to the answers or solutions obtained from the problems faced, comparing reactions to experiences related to re-examination and seeking conformity between the implementation of the strategy and the problems faced and finding the best answers or solutions, re-examining the steps that must be taken and the answers, detecting and correcting errors made, and making good and correct conclusions. This can be seen when respondents conduct learning simulations while reflecting on what has

been done in the learning simulation process. The characteristics of the answers for the first indicator are presented in Table 5.

Table 5. Characteristics of Respondents' Answers for the Third Indicator

Respondent Group	Contemplating
Habitual Action	Respondents carry out learning according to their habits without any reflection.
Understanding	Respondents carry out learning based on previously prepared planning, but are not ready for incidental events outside the planning that occur in the learning simulation. This group has also not prepared learning reflections.
Reflection	Respondents think about previous experiences and how these experiences affect their thoughts and actions when carrying out the learning simulation. Respondents try to overcome incidental problems that arise and include them in the reflection material, but specific follow-up actions have not been prepared.
Critical Reflection	Respondents integrate previous experiences in the learning simulation. Respondents try to carry out learning according to the prepared planning and are also able to anticipate and/or overcome incidental events that occur. Learning reflections are written in detail and critically accompanied by specific follow-up plans.

Based on Table 5, it can be concluded that at the habitual action stage, learning is carried out without reflection, indicating a routine and automatic approach. At the understanding stage, even though there is clear planning, respondents still have difficulty dealing with unexpected events in the simulation and have not reflected. At the reflection stage, respondents begin to reflect on past experiences and try to overcome incidental problems, but have not yet developed a specific follow-up plan. Finally, at the critical reflection stage, respondents successfully integrate experiences, are able to anticipate incidental events, and write in-depth reflections and develop clear action plans. This shows an increase in the depth of thinking and the ability to learn from experience, which is essential for continuous self-development. Further information can be found from the excerpts of the results of interviews with respondents presented in Table 6.

Table 6. Excerpt from Respondents' Answers on Contemplating

Habitual Action		Understanding		Reflection		Critical Reflection	
R16	"I conducted the learning as usual, I think the learning is good. Although there was a child who was less active earlier, but that child is always like that in every learning, it has become a habit and other teachers have memorized it."	R22	"I have tried to conduct the learning according to the teaching module that I have prepared, but some things such as student questions that are sometimes beyond reason, are a little difficult for me to answer, so I go blank."	R25	"In my opinion, the learning I conducted was according to plan, I also used learning media to activate students. There was a commotion earlier but I immediately gave ice breaking to refocus. This happened because the learning may need to be varied again so that students don't get bored."	R13	"I have adjusted the learning that I have conducted to the teaching module, but there are some things that are not appropriate because I forgot. I also made maximum use of media and teaching materials, but there were a few things I forgot, such as informing the procedure for filling out the LKPD, so maybe this is my reflection material from this learning, so the follow-up plan that I made was to include keywords in the presentation materials, so that I don't forget."

Discussion

The research identified four reflective thinking patterns among pre-service teachers: habitual action, understanding, reflection, and critical reflection. Each pattern represents different levels of depth in thinking and self-awareness in the learning process. The mapping shows that there are variations in the reflective thinking patterns of pre-service teachers when implementing classroom instruction. The habitual action pattern indicates that some pre-service teachers conduct lessons routinely without deep reflection (Colomer et al., 2020; Korthagen & Nuijten, 2022). The weakness of this pattern lies in the lack of innovation and adaptation in teaching methods, causing pre-service teachers to become stagnant and unable to face new challenges in the classroom. On the other hand, its strength lies in consistency, which may be beneficial in stable environments. Pre-service teachers exhibiting the understanding pattern demonstrate a good grasp of the material being taught and are able to plan lessons effectively. However, they are still less prepared to face unexpected situations. The weakness of this pattern is the lack of flexibility and innovation, while its strength lies in the ability to design well-structured lessons (Setyorini & Sukirman, 2020; Sims & Fletcher-Wood, 2021).

The reflection pattern shows that pre-service teachers begin to reflect on their learning experiences and how these experiences impact their teaching practices (Situmorang et al., 2022; Tampubolon, 2020). The strength of this pattern is the increased self-awareness and the ability to address emerging problems. However, its weakness lies in the lack of specific follow-up actions, which may lead to uncertainty in improving future practices. Pre-service teachers operating within this pattern are capable of integrating past experiences and anticipating future challenges. The strength of this pattern is the ability to bring about meaningful and planned changes, while its weakness may lie in the tendency toward overthinking, which could hinder swift and efficient action. From this analysis, it can be seen that each reflective thinking pattern has its own strengths and weaknesses. Pre-service teachers need to be encouraged to shift from habitual action to critical reflection in order to become more effective educators (Amelia & Ramadan, 2021; Balqis & Syaikhu, 2023).

Reflective thinking patterns among pre-service teachers have significant implications for their professional development. Understanding and applying reflective thinking is not only important for improving teaching quality but also for shaping the character and professional competencies required in an ever-evolving educational landscape (Bardach et al., 2021; Calavia et al., 2021). Reflective thinking, up to the level of critical reflection, encourages pre-service teachers not only to understand content but also to examine the teaching methods they employ. By analyzing their learning experiences and responding to feedback from students, pre-service teachers can continuously adapt and enhance their teaching practices. Research by other scholars shows that teachers engaged in reflective practices are better able to create inclusive and responsive learning environments. Through reflective thinking, pre-service teachers can also enhance their interpersonal skills, such as communication and empathy. These skills are crucial for building positive relationships with students and colleagues (Colomer et al., 2020; Korthagen & Nuijten, 2022).

Reflective thinking helps pre-service teachers become better prepared to face various challenges that may arise during the teaching and learning process (Akpur, 2020; Sims & Fletcher-Wood, 2021). For example, those who develop understanding and reflection patterns are more capable of adapting to curriculum changes and new technologies in teaching. A study by other researchers indicated that teachers engaged in critical reflection have better strategies for handling difficult situations in the classroom. These teachers possess strong classroom management skills and are able to deal effectively with incidental problems (Carlson, 2019; Fathi et al., 2021). Reflective thinking also plays a key role in shaping the professional identity of pre-service teachers (Cheng, 2021; Sims & Fletcher-Wood, 2021; Situmorang et al., 2022). By actively reflecting on their experiences and values, pre-service teachers can develop a clearer understanding of their role as educators. This is consistent with research emphasizing the importance of reflection in building a strong professional identity among teachers (Korthagen & Nuijten, 2022; Nuryani & Handayani, 2020)

The application of reflective thinking can also encourage the formation of learning communities among prospective teachers. Group discussions about reflective experiences can strengthen collaboration and support among them (Toikka & Tarnanen, 2024; Yaacob et al., 2020). Thus, reflective thinking serves as an essential tool in the professional development of prospective teachers, helping them enhance teaching quality, develop interpersonal skills, and build a professional identity. Therefore, it is important for teacher training programs to integrate reflective practices into their curricula. The results of this study indicate that prospective teachers' reflective thinking spans a spectrum from habitual action to critical reflection. This variation highlights the diverse levels of professional readiness among them. These findings clarify that developing critical reflection is a crucial step toward producing adaptive, innovative teachers who are capable of responding to the dynamic challenges of education.

A major strength of this study lies in its detailed mapping of four patterns of prospective teachers' reflective thinking, providing a clear picture of the depth of their reflection within a learning context. Furthermore, the study connects each reflection pattern with its respective strengths and weaknesses, making the findings highly applicable to the development of teacher education. This research makes a significant contribution to the field of teacher education, particularly in emphasizing the need to integrate reflective practices into teacher training curricula. It also enriches the literature on the development of prospective teachers' reflective thinking in the modern education era. The implications of this study suggest that teacher education programs should design learning activities that foster critical reflection from an early stage. This can be achieved through reflective journals, peer reviews, case studies, or feedback-based teaching practices. Additionally, training in interpersonal skills through reflection should become an integral part of teacher education curricula. A limitation of this study is its narrow focus on prospective teachers and its lack of exploration into the long-term impact of reflective thinking on their careers after becoming professional teachers. Future research is recommended to conduct longitudinal studies to track the development of reflective thinking from college years into professional practice. It is also suggested to expand the research by examining external factors, such as institutional support or school culture, that may influence prospective teachers' reflective abilities.

4. CONCLUSION

The study identifies four distinct patterns of reflective thinking among prospective teachers—habitual action, understanding, reflection, and critical reflection each representing different levels of cognitive depth and self-awareness in the learning process. The findings indicate that the achievement of reflective thinking at the synthesis level remains low, suggesting that prospective teachers' ability to think reflectively in conducting learning is not yet optimal. Furthermore, variations in reflective thinking patterns influence how they react to classroom situations, elaborate on learning needs, and contemplate their experiences. These findings contribute to the understanding of reflective thinking in teacher education by providing a structured mapping of how prospective teachers engage in reflection. This study suggests that reflective thinking should be systematically developed to enhance professional competencies and adaptability in real teaching scenarios. Given that this research is limited to identifying reflective thinking patterns before teachers enter the profession, future studies should explore how these patterns manifest in actual teaching practices and examine the supporting and inhibiting factors that influence reflective thinking development. This could lead to the formulation of a structured framework or model for fostering reflective thinking in teacher education programs.

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