

## Embedding Metacognitive Awareness and Problem-Solving Skills: Insights from EFL Pre-Service Teachers

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**Keywords:**

digital era, EFL pre-service teachers, metacognitive awareness, problem-solving skills, reflective teaching practice.

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**Abstract:** Metacognitive awareness and problem-solving skills are widely regarded as essential competencies for pre-service teachers in the digital era. These abilities enable future teachers to reflect on their teaching strategies, adapt to classroom challenges, and integrate technology effectively in English as a Foreign Language (EFL) context. This study explores pre-service teachers' perceptions of their metacognitive awareness and problem-solving skills after participating in teaching practicum. A survey involving 58 participants employed a structured questionnaire to assess their capacities in planning, monitoring, evaluating, and addressing classroom-related problems. The findings reveal consistently positive responses across all components, suggesting that participants perceive themselves as capable of regulating teaching processes and managing pedagogical challenges. Respondents highlighted strong competencies in lesson planning, adjusting strategies, and generating effective classroom solutions. These results underscore the significance of teaching practicum in fostering reflective teaching practice and adaptive problem-solving, both of which are crucial for navigating the complexities of digital-era classrooms. The study emphasizes the need to empower teacher education by embedding metacognitive and problem-solving competencies explicitly within teacher education and professional development programs.

## INTRODUCTION

In an increasingly complex and digitally-driven educational landscape, the competencies of pre-service teachers have evolved beyond traditional pedagogical knowledge to include higher-order cognitive skills. Among these, metacognitive awareness and problem-solving skills are recognized as critical for success in the 21st-century classroom (Mitsea et al., 2021). Metacognition enables teachers to self-regulate their learning and teaching processes by actively planning, monitoring, and evaluating their strategies (Xu et al., 2025). Then, effective problem-solving skills are essential for navigating the unpredictable classroom content and its challenges (Kök & Duman, 2023). It is important to meet the diverse student needs

(Pramerta, 2024). Thus, metacognitive awareness and problem-solving skills are relevant within the English as a Foreign Language (EFL) context.

This study is rooted in constructivist learning theories. Learners actively construct their own understanding (Hong & Han, 2024). In the context of teacher education, this means pre-service teachers must be adaptive and reflective for their teaching. Metacognitive awareness aligns with this notion by providing a framework for self-regulation, and problem-solving emphasizes a systematic approach to identifying and addressing practical issues. Furthermore, metacognitive awareness connects with academic performance and teacher effectiveness (Stanton et al., 2021). It is a foundation for life-long-learning processes (Kallio et al., 2021).

Regarding the importance of these two skills, there remains a significant gap in understanding how EFL pre-service teachers perceive their own capabilities in applying metacognitive and problem-solving strategies, particularly after completing their teaching practicum. While the practicum is often regarded as a critical stage in preparing future teachers to bridge theory and practice, little is known about the extent to which it enhances their self-awareness in monitoring, evaluating, and regulating their learning processes. Similarly, their ability to identify problems, generate solutions, and implement strategies effectively in real classroom contexts has not been thoroughly explored. This gap highlights the need for further investigation into how pre-service teachers reflect on their strengths and weaknesses in these areas, as such insights are essential for designing teacher education programs.

This research lies in its focus on the perceptions of EFL pre-service teachers, offering unique insights based on the teaching practicum. In response to this identified gap, this research aims to achieve the following objective: (1) to explore pre-service teachers' perceptions of their metacognitive awareness and problem-solving skills; and (2) to investigate how these skills are perceived to be embedded in EFL classroom.

Based on these objectives, it is assumed that pre-service teachers will report a consistently positive perception of their metacognitive and problem-solving skills, highlighting the importance of teaching practicum in the development of reflective

and adaptive teaching practices. This study is expected to contribute valuable insights to teacher education programs, informing the development of curricula that explicitly embed metacognitive awareness and problem-solving skills.

## RESEARCH METHODS

This study employed a quantitative survey design to investigate the perceptions of pre-service teachers regarding their metacognitive awareness and problem-solving skills. The research involved 58 EFL pre-service teachers who had completed the teaching practicum at junior and high schools. Participants were selected using purposive sampling, as they represented students with authentic classroom teaching experience. The following table is shown participant's background.

Table 1. Participant's Background

Aspect		Percentage
Gender	Female	77.6%
	Male	22.4%
School Level	Junior High School	87.9%
	Senior High School	12.1%
English Use in Teaching Practicum	100% Indonesian, 0% English	1.7%
	75% Indonesian, 25% English	13.8%
	50% Indonesian, 50% English	74.1%
	25% Indonesian, 75% English	10.3%
	0% Indonesian, 100% English	0%

The main instrument of data collection was a structured questionnaire, adapted from the Metacognitive Awareness Inventory for Teachers (MAIT) (Balcikanli, 2011). Responses were collected using a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). Data were collected online via Google Form and analyzed using descriptive statistics to identify trends and response.

## RESULTS AND DISCUSSION

### *Results*

This section presents the results of the survey conducted to examine pre-service EFL teachers' perceptions of their metacognitive awareness and problem-

solving skills after participating in the teaching practicum. The first set of findings focuses on participants' metacognitive awareness, as presented in Table 2. This dimension is critical in understanding how EFL pre-service teachers regulate their own learning and teaching processes, particularly in planning, monitoring, and evaluating strategies during classroom practice.

Table 2. Participant's Metacognitive Awareness

Statements	Response				
	SD	D	N	A	SA
I am aware of the strategies I use when teaching.	0%	0%	0%	55.2%	44.8%
I can identify weaknesses in my understanding.	0%	0%	1.7%	60.3%	37.9%
I evaluate the effectiveness of my teaching strategies.	0%	0%	1.7%	65.5%	32.8%
I understand how I think when solving a problem.	0%	0%	0%	65.5%	34.5%
I realize when to change my teaching strategies.	0%	0%	6.9%	62.1%	31%
I plan ahead before teaching.	0%	0%	0%	44.8%	55.2%
I adjust my strategies if the approach I implement does not work.	0%	0%	3.4%	58.6%	37.9%
I monitor my progress in completing tasks.	0%	0%	1.7%	62.1%	36.2%
I evaluate my work to understand what can be improved in the future.	0%	0%	0%	60.3%	39.7%
I can control my focus and attention when teaching.	0%	0%	3.4%	60.3%	36.2%
I can quickly recognize problems that arise when teaching.	0%	0%	6.9%	67.2%	25.9%

The survey results on participants' metacognitive awareness indicate predominantly positive responses across all items. The data reveal that a substantial proportion of participants consistently rated themselves within the "Agree" and "Strongly Agree" categories, reflecting strong self-perceptions of metacognitive regulation and problem-solving in teaching.

For instance, lesson planning was perceived very positively, with 44.8% agree and 55.2% strongly agree that they plan ahead before teaching. Similarly, awareness of teaching strategies was also high, with 55.2% agree and 44.8% strongly agree that they are aware of the strategies they use. Participants also demonstrated a strong sense of self-monitoring in completing tasks, with 62.1% agree and 36.2% strongly agree.

However, certain areas showed slightly lower levels of strong agreement. For example, the ability to realize when to change teaching strategies yielded 62.1% agree and only 31% strongly agree, while 6.9% reported being neutral. Similarly, the capacity to quickly recognize problems that arise when teaching recorded the highest neutral responses (6.9%) and a relatively lower proportion of strong agreement (25.9%).

Table 3. Participant's Problem-Solving Skill

Statements	Response				
	SD	D	N	A	SA
I am able to identify the root cause of a problem before looking for a solution.	0%	0%	8.6%	65.5%	25.9%
I can distinguish between major and minor problems when teaching.	0%	0%	6.9%	65.5%	27.6%
I am able to gather relevant information before making decisions related to a problem.	0%	0%	5.2%	65.5%	29.3%
I can understand various points of view before concluding a problem.	0%	1.7%	5.2%	65.5%	27.6%
I consider various alternatives before choosing the best solution.	0%	1.7%	1.7%	69%	27.6%
I develop a plan before taking action to solve a problem.	0%	0%	1.7%	63.8%	34.5%
I can take systematic steps in solving a problem.	0%	0%	3.4%	75.9%	20.7%
I identify resources that can help in solving problems.	0%	0%	1.7%	74.1%	24.1%
I can determine priorities in developing solutions to a problem.	0%	0%	3.4%	67.2%	29.3%
I dare to try new approaches in solving problems.	0%	0%	3.4%	70.7%	25.9%
I am able to adjust my strategy when facing difficulties in solving problems.	0%	0%	3.4%	72.4%	24.1%
I reflect on the solutions I have chosen to determine their effectiveness.	0%	0%	1.7%	70.7%	27.6%
I ask for feedback from others to improve my problem-solving skills.	0%	1.7%	5.2%	60.3%	32.8%
I understand the need for critical thinking and creative solutions in facing challenges while teaching.	0%	0%	1.7%	56.9%	41.4%

The survey results reveal that the majority of EFL pre-service teachers demonstrated a relatively high level of confidence in their problem-solving skills after completing their teaching practicum. Across most indicators, the responses were concentrated in the agree and strongly agree categories.

For instance, 65.5% of respondents agreed and 25.9% strongly agreed that they were able to identify the root cause of a problem before looking for a solution, indicating an enhanced ability to analyze situations critically. A similar trend appeared in their ability to distinguish between major and minor problems, where 65.5% agree and 27.6% strongly agree, suggesting that pre-service teachers had developed the capacity to prioritize issues in teaching contexts.

The ability to gather relevant information before decision-making was also positively perceived, with 65.5% agree and 29.3% strongly agree. Furthermore, 70.7% agree and 27.6% strongly agree that they could understand various points of view before concluding a problem, reflecting a growing awareness of multiple perspectives in pedagogical decision-making.

Strategic planning also emerged as a strong indicator, with 63.8% agree and 34.5% strongly agree. This was reinforced by their systematic approach to problem-solving, as 75.9% agree and 20.7% strongly agree that they could take structured steps in addressing challenges. Moreover, 74.1% agree and 24.1% strongly agree that they could identify relevant resources in finding external support when needed.

When it came to adaptability and creativity aspect, 70.7% agree and 25.9% strongly agree, while 72.4% agree and 24.1% strongly agree that they could adjust strategies when difficulties arose. Reflection and evaluation skills were also evident, as 70.7% agree and 27.6% strongly agree on the effectiveness of their chosen solutions. Then, feedback-seeking behavior was visible, with 60.3% agree and 32.8% strongly agree.

Finally, the importance of higher-order thinking was strongly acknowledged. A substantial proportion of participants, 56.9% agree and 41.4% strongly agree, recognized the need for both critical and creative thinking in overcoming teaching challenges.

## ***Discussion***

The findings of this study shed light on the interrelated nature of metacognitive awareness and problem-solving skills among EFL pre-service teachers after completing their teaching practicum. Overall, the results revealed

predominantly positive self-perceptions across both dimensions, with most participants consistently rating themselves within the agree and strongly agree categories. This suggests that the practicum played a crucial role in enabling pre-service teachers to not only regulate their own cognitive processes but also to apply structured strategies in addressing real classroom challenges. It aligns with Maharani and Fithriani (2023) who found that teaching practicum is an important stages for pre-service teachers.

With regard to metacognitive awareness, participants reported a strong ability to plan, monitor, and evaluate their teaching practices. For example, the majority affirmed that they planned ahead before teaching and were conscious of the strategies they applied. This aligns with the notion of metacognitive regulation, which emphasizes the deliberate planning and monitoring of one's cognitive activities (Hennecke & Bürgler, 2023; Rivas et al., 2022). However, areas such as recognizing when to change strategies and quickly identifying problems in teaching showed slightly lower levels of strong agreement. They often requires more experience and reflective practice to develop (Roberts et al., 2021).

Similarly, the results concerning problem-solving skills suggest that pre-service teachers demonstrated confidence in analyzing problems, generating solutions, and applying systematic approaches in classroom contexts. Most notably, a large majority indicated that they were able to identify root causes, distinguish between major and minor problems, and gather relevant information before decision-making. These findings underscores that effective problem solvers not only engage in solution generation but also in problem representation and diagnosis (Kim & Tawfik, 2023). Moreover, the strong responses related to adaptability, creativity, and reflection highlight the participants' growing ability to adjust strategies when facing difficulties. It is essential in dynamic and unpredictable classroom environments (Anderson et al., 2021; Mallillin, 2022).

Taken together, these findings underscore the complementary relationship between metacognitive awareness and problem-solving. EFL pre-service teachers who are able to plan, monitor, and evaluate their teaching are more likely to apply structured and adaptive strategies when addressing problems. It is an indicator of a

successful educational process (Kozulin, 2021). This interconnection shows that higher-order teaching competencies are best developed through experiential contexts (Gupta & Mishra, 2021). Consequently, it requires simultaneous engagement in reflective thought and practical decision-making.

Nevertheless, the areas with lower strong agreement, particularly recognizing when to adapt strategies and quickly identifying emerging problem, point to developmental gaps that teacher education programs should address. These skills are often linked to adaptive expertise and situational awareness, which may only be fully cultivated through extended teaching experience and guided reflection (Darling-Hammond et al., 2024; Kua et al., 2021). Therefore, integrating more structured reflective activities, peer feedback, and problem-based teaching simulations into teacher education curricula could further improve and strengthen these competencies.

In conclusion, this study highlights that teaching practicum serves as a critical context for enhancing both metacognitive awareness and problem-solving skills among EFL pre-service teachers. The integration of these two domains is vital for preparing teachers who can navigate complex classroom realities with adaptability, reflection, and professional judgment.

## **CONCLUSIONS AND RECOMMENDATIONS**

This study explored EFL pre-service teachers' perceptions of their metacognitive awareness and problem-solving skills after participating in a teaching practicum. The findings revealed consistently positive responses across planning, monitoring, and evaluating strategies, as well as in addressing classroom-related problems. Participants demonstrated strong confidence in lesson planning, reflective thinking, and generating solutions to pedagogical challenges, indicating that the practicum experience effectively fostered reflective teaching practice and adaptive problem-solving. However, skills related to real-time problem recognition and adaptive strategy adjustment received relatively lower agreement, suggesting that further scaffolding is needed to strengthen these abilities.

Based on these insights, it is recommended that teacher education programs explicitly embed metacognitive and problem-solving competencies into their curriculum, supported by guided reflections, problem-based simulations, and targeted feedback from mentors. Teacher educators and supervisors should encourage reflective journaling, peer evaluation, and critical incident analysis to enhance practical application of these skills. At the policy level, embedding these competencies as core standards within teacher education will align professional preparation with the demands of the digital era, where adaptability, critical thinking, and meaningful technology integration are essential. This study suggests on developing reflective and adaptive pre-service teachers who are better prepared to navigate the complexities of modern classrooms.

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