



The effect of decision-making infusion strategy on pre-service biology education teachers' self-efficacy

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ARTICLE INFO	ABSTRACT
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Keywords: Case-based learning Decision-making skills Pedagogical knowledge Reflective practice Teacher preparation	Teacher self-efficacy is essential for effective teaching, yet many pre-service teachers still lack confidence in managing classrooms, selecting instructional strategies, and engaging students. This suggest that they need for an instructional approach that can strengthen their pedagogical decision-making. To address this issue, the Decision-Making Infusion Strategy (DMIS) is introduced as an innovative learning strategy integrated into the teacher education curriculum. This study aims to examine the effect of the Decision-Making Infusion Strategy (DMIS) on the self-efficacy of pre-service biology teachers, particularly in making pedagogical decisions related to classroom management, instructional strategies, and student engagement. The study employed an explanatory sequential mixed-methods design, in which DMIS was implemented as an instructional intervention during a pedagogy course. Quantitative data were collected using a Teacher Self-Efficacy Scale (TSES) adapted from Tschannen-Moran and Hoy, while qualitative data were obtained through semi-structured interviews. Quantitative data were analyzed using a paired-sample t-test, whereas qualitative data were analyzed using thematic analysis. The results showed a significant increase in self-efficacy scores following the DMIS intervention ($p < 0.05$). Qualitative findings further supported these results by identifying three key contributions of DMIS in strengthening pre-service teachers' self-efficacy: (1) developing decision-making competence, (2) shifting from theoretical to reflective practice, and (3) mastery of pedagogical knowledge. These findings indicate that DMIS is effective in enhancing pre-service teachers' self-efficacy and suggest that integrating DMIS into teacher education curricula can better prepare future biology teachers for classroom challenges. Future studies should apply experimental design with larger samples to confirm the long-term impact of DMIS on teacher development.

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INTRODUCTION

Teachers are the cornerstone of education; thus, preparing their careers from the outset is a crucial investment to ensure the development of dedicated and competent educators. Self-efficacy constitutes an essential component of pre-service teachers' competencies (Depping et al., 2024). It enables them to cultivate confidence and optimism in designing effective instruction and managing the diverse characteristics of students. For teachers, high self-efficacy also serves as a protective factor against burnout and reduces intentions to leave the profession (Bandura, 2012). Consequently, strong self-efficacy reinforces pre-service teachers' commitment to the profession (Chesnut & Burley, 2015; Louis et al., 2024).

Self-efficacy is defined as one's belief in one's ability to organize and execute the actions required to achieve specific outcomes (Bandura, 1977). In the teaching context, teacher self-efficacy refers to teachers' confidence in their capacity to influence student learning and performance (Depping et al., 2024). In recent years, teacher resilience and self-efficacy have emerged as key components of teacher well-being and as protective factors against teacher burnout (Li, 2023).

Research on teacher characteristics indicates that low levels of self-efficacy are positively associated with burnout (Waweru et al., 2021) and negatively associated with job satisfaction and organizational commitment (Han & Wang, 2021; Skaalvik & Skaalvik, 2014). Field studies in countries such as Malaysia and New Zealand also reveal low levels of self-efficacy among pre-service teachers (Berg & Smith, 2014). A study involving pre-service English language teachers showed that 56.1% of students reported low self-efficacy, underscoring the need for learning interventions aimed at strengthening self-efficacy (Mavili Kiluken, 2024). Another study involving 103 pre-service teacher education students similarly reported low outcomes, highlighting the importance for researchers, teacher educators, and curriculum designers to focus more on aspects that enhance pre-service teachers' self-efficacy (K.V & Venukapalli, 2023). One factor identified in recent studies as contributing to the development of pre-service teachers' self-efficacy is pedagogical knowledge (Aksu & Kul, 2019; Espinosa et al., 2024).

Pedagogical knowledge represents a synthesis of pedagogical and psychological aspects, encompassing knowledge of how to design and facilitate effective learning for all students (Guerriero, 2017; Voss et al., 2011). However, many pre-service teachers still struggle to connect pedagogical theory with real-world educational cases (Bakker et al., 2024; Korthagen, 2009). This gap often leaves them unprepared to address authentic classroom challenges, resulting in lower levels of self-efficacy (Eğinli & Solhi, 2021). Therefore, pre-service teachers must be exposed to pedagogical content alongside authentic case studies (Klassen et al., 2021; Nodine et al., 2024; Watson et al., 2023). Such exposure fosters familiarity and serves as preparation for their teaching practicum in schools (Allsopp et al., 2006; Klassen et al., 2021). Hence, it is necessary to design instructional strategies specifically aimed at enhancing pre-service teachers' self-efficacy.

Several studies have identified a relationship between pedagogical knowledge and pre-service teachers' self-efficacy; however, most of these studies remain descriptive in nature (Hamurcu & Canbulat, 2019; Putra et al., 2024) and have not thoroughly explored how authentic problem-based interventions can strengthen teachers' self-efficacy (Willems et al., 2021). Consequently, there has been limited exploration into how authentic, problem-based instructional strategies can actively enhance pre-service teachers' self-efficacy within pedagogical decision-making. In addition, the majority of previous research has focused on in-service teachers rather than pre-service teachers who are still in the process of becoming professional educators (Gale et al., 2021; Zee & Koomen, 2016). This creates a methodological and contextual gap, as findings regarding in-service teachers may not accurately represent the specific learning needs within pre-service teacher education. This gap highlights the need for a learning design within teacher education curricula that integrates authentic case studies with pedagogical content, directly serving as a stimulus for the development of pre-service teachers' self-efficacy.

The Decision-Making Infusion Strategy (DMIS) is an instructional strategy that provides pre-service teachers with training through authentic classroom cases, followed by opportunities to make appropriate decisions in response to specific classroom phenomena (Sukma et al., 2021; Swartz & Parks, 2001). Real-case scenario-based DMIS aims to provide authentic learning experiences that foster cognitive growth, strengthen self-efficacy in managing challenging situations (Hemphill et al., 2015;

Klassen et al., 2021), and support the development of decision-making skills. Despite the potential of DMIS to improve higher-order thinking, its impact on pre-service teachers' self-efficacy has yet to be empirically established. Previous studies have shown that pedagogical knowledge and authentic case-based learning can support teacher self-efficacy (Castro-Villarreal et al., 2025; Voelkel & Chrispeels, 2017), but the specific impact of the Decision-Making Infusion Strategy (DMIS) on pre-service biology teachers remains underexplored. While no studies have directly examined the impact of DMIS on pre-service teachers' self-efficacy, several investigations suggest that decision-making strategies positively influence students' self-efficacy (Fillipo, 2023; Klassen et al., 2023). A meta-analysis study found that teacher professional development focusing on data-based decision-making had a positive effect on teachers' self-efficacy, with effect sizes (ES) ranging from -0.08 to 0.78 (Gesel et al., 2021). Previous studies have demonstrated that decision-making strategies primarily focus on learning outcomes and are largely limited to in-service teacher development programs, rather than the development of pre-service teachers' self-efficacy.

Therefore, this study examines the effect of the Decision-Making Infusion Strategy on the self-efficacy of pre-service biology teachers. Specifically, it focuses on three core dimensions: classroom management, instructional strategies, and student engagement. Employing an explanatory sequential mixed-methods design, this study quantitatively measures changes in self-efficacy following the intervention while eliciting deeper insights through qualitative analysis. Accordingly, this study is guided by the following research questions:

- 1) Is there a significant difference in pre-service biology teachers' self-efficacy before and after the implementation of DMIS?
- 2) How do pre-service teachers experience the DMIS during the learning process?

METHODS

Research Design

This study utilized an explanatory sequential mixed-methods design, which begins with quantitative data collection followed by a qualitative phase to provide a deeper understanding of the initial results (Creswell & Plano Clark, 2018). The quantitative phase evaluated changes in self-efficacy using a one-group pretest–posttest design, while the qualitative phase employed a descriptive approach to explore students' lived experiences during the intervention. The research workflow is summarized in Table 1.

Table 1.
Research Design of the Study

Phase	Design	Participants	Instrument
I: Quantitative	One-group pretest–post-test	50 pre-service biology teachers	Adapted TSES (24 items)
II: Qualitative	Descriptive qualitative (Thematic Analysis)	6 selected pre-service biology teachers (Purposive)	Semi-structured interview guide

Population and Samples

The population of this study consisted of approximately 375 students enrolled in the Biology Education Program at University of Jember. The quantitative phase involved 50 second-semester pre-service biology teachers selected through purposive and random sampling, while the qualitative phase involved 6 participants purposively selected using maximum variation sampling based on post-test self-efficacy levels. Table 2 presents the characteristics of the population and samples involved in this study.

Table 2.

Demographic Characteristics of the Population and Samples

Demographic Characteristics (Population, N = 375)	Quantitative Sample (n=50)	Qualitative Participants (n=6)
Gender		
Female	47	5
Male	3	1
Self-efficacy Level		
Low	-	2
Moderate	-	2
High	-	2

Instrument

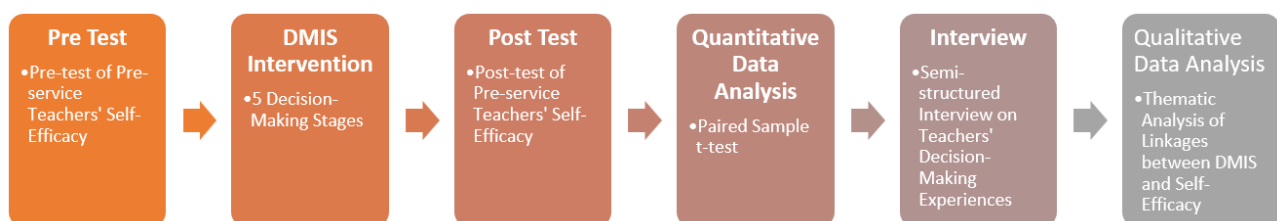
Decision-making activities were systematically integrated into regular instruction through a structured sequence of stages adapted from decision-making strategy models. Self-efficacy was measured using the Teacher Self-Efficacy Scale (TSES), originally developed and validated by Tschannen-Moran and Woolfolk Hoy (2001), which conceptualizes teacher self-efficacy across three core dimensions: student engagement, instructional strategies, and classroom management.

Given the TSES is a standardized and widely validated instrument, this study relied on its established construct validity. The adaptation process was limited to linguistic and contextual adjustments to suit the pre-service biology teacher context without altering the original meaning or factor structure of the items. The scale consisted of 24 items rated on a nine-point response scale ranging from 1 (nothing) to 9 (a great deal). The internal consistency of the adapted instrument was examined using Cronbach's alpha, yielding a coefficient of 0.983, indicating excellent reliability.

Qualitative data were collected through semi-structured interviews. The interview guide was developed to align with the research objectives, specifically focusing on the Decision-Making Instructional Sequence (DMIS) and pre-service teachers' self-efficacy. Questions were designed to explore perceptions of self-efficacy changes, decision-making processes, and teaching readiness following the intervention. Example inquiries included: 'Has your confidence increased after the course, particularly regarding your future career as a teacher?' and 'How did the Case Study method (problem analysis, consequences, and solution determination) affect your learning?' Before data collection, the interview guide was reviewed by experts in biology education to ensure clarity, relevance, and alignment with the research focus.

Procedure

The DMIS intervention was implemented through three instructional sessions conducted over a six-week period. Each session followed a structured five-stage sequence: (1) identifying the situation or problem, (2) clarifying goals, (3) generating alternatives, (4) evaluating consequences, and (5) making decisions. These stages were integrated into each session to facilitate reflective and systematic decision-making processes among participants. As illustrated in Figure 1, the study began with a pretest administration, followed by the DMIS intervention and post-test measurement. Quantitative data were subsequently analyzed using a paired-sample t-test. To obtain deeper insights into participants' learning experiences, semi-structured interviews were conducted after the quantitative phase and analyzed using thematic analysis.

**Figure 1.** Research Procedure

Data Analysis Techniques

Quantitative data were analyzed using a paired-samples t-test to determine whether significant differences existed in self-efficacy scores before and after the intervention. The analysis was conducted using IBM SPSS Statistics. Prior to the t-test, data normality was assessed using the Kolmogorov-Smirnov test as a statistical prerequisite. Homogeneity testing was not performed, as the study utilized a one-group pretest–post-test design. Qualitative data obtained from semi-structured interviews were analyzed via thematic analysis, following the framework proposed by Braun and Clarke (2006). This analysis aimed to identify recurring patterns of meaning across participant responses and to provide a nuanced contextualization of the quantitative findings. Rather than seeking broad generalizability, the qualitative phase focused on capturing the depth of the pre-service biology teachers' learning experiences

RESULTS AND DISCUSSION

This study involved 50 students who participated in the DMIS intervention. Table 3 presents the descriptive statistics of the pretest and post-test results of students' self-efficacy. The normality test of the pretest and post-test data was conducted using the Kolmogorov–Smirnov test. The results showed that both datasets had significance values greater than 0.05 (Pretest = 0.06; Post-test = 0.20), indicating that the data were normally distributed and thus met the assumption for conducting a paired t-test.

Table 3.

Descriptive Statistics of Pretest and Posttest Self-Efficacy of Pre-Service Biology Teachers

Result	Mean	SD
Pretest	76.45	±2.23
Posttest	81.25	±1.53

The mean difference between the pretest and post-test self-efficacy scores was -4.80 with a standard deviation of 8.92, as presented in Table 4. The t-value was -3.81 with 49 degrees of freedom (df), and the p-value (Sig. 2-tailed) was 0.000.

Table 4.

T-test Result

t Test Result								
	Mean	Std. deviation	Std. error mean	Paired differences		t	df	Sig. (2-tailed)
				95% confidence interval of the difference				
				Lower	Upper			
PreSE - PostSE	-4.80	8.92	1.26	-7.34	-2.27	-3.81	49	0.000

This finding suggests that participation in structured decision-making activities contributed to students' confidence in handling pedagogical tasks and classroom-related situations. The improvement may be attributed to the nature of DMIS, which engaged participants in systematic problem identification, alternative generation, consequence evaluation, and reflective decision-making. Repeated exposure to authentic classroom cases likely functioned as mastery experiences, which Bandura identified as one of the most influential sources of self-efficacy development. In this context, DMIS not only enhanced pedagogical understanding but also strengthened participants' confidence in applying instructional decisions to realistic teaching situations.

These quantitative findings are consistent with previous research demonstrating that decision-making processes are positively associated with self-efficacy across various domains. For instance, a study conducted in Brazil examining the relationship between decision-making strategies and self-efficacy revealed a significant correlation between decision-making and higher levels of dedication and confidence (Karpinski et al., 2020). Similarly, research on young athletes compared to senior athletes without decision-making interventions found that decision-making processes improved athletes' self-efficacy, particularly in performance and motor skills (Musculus et al., 2018). Collectively, these studies

support the argument that systematic decision-making experiences can strengthen individuals' confidence in performing complex professional responsibilities, including teaching-related tasks.

While these findings confirm the overall effectiveness of DMIS, a more nuanced understanding can be obtained by examining improvements across each dimension of teacher self-efficacy as measured by the TSES. Therefore, the following discussion elaborates on how DMIS contributed to changes in student engagement, classroom management, and instructional strategies, and how these improvements can be theoretically linked to decision-making processes. Further analysis of each self-efficacy indicator revealed improvements across all dimensions, as illustrated in Figure 2. These indicators align with the three domains of the TSES: student engagement, classroom management, and instructional strategies.

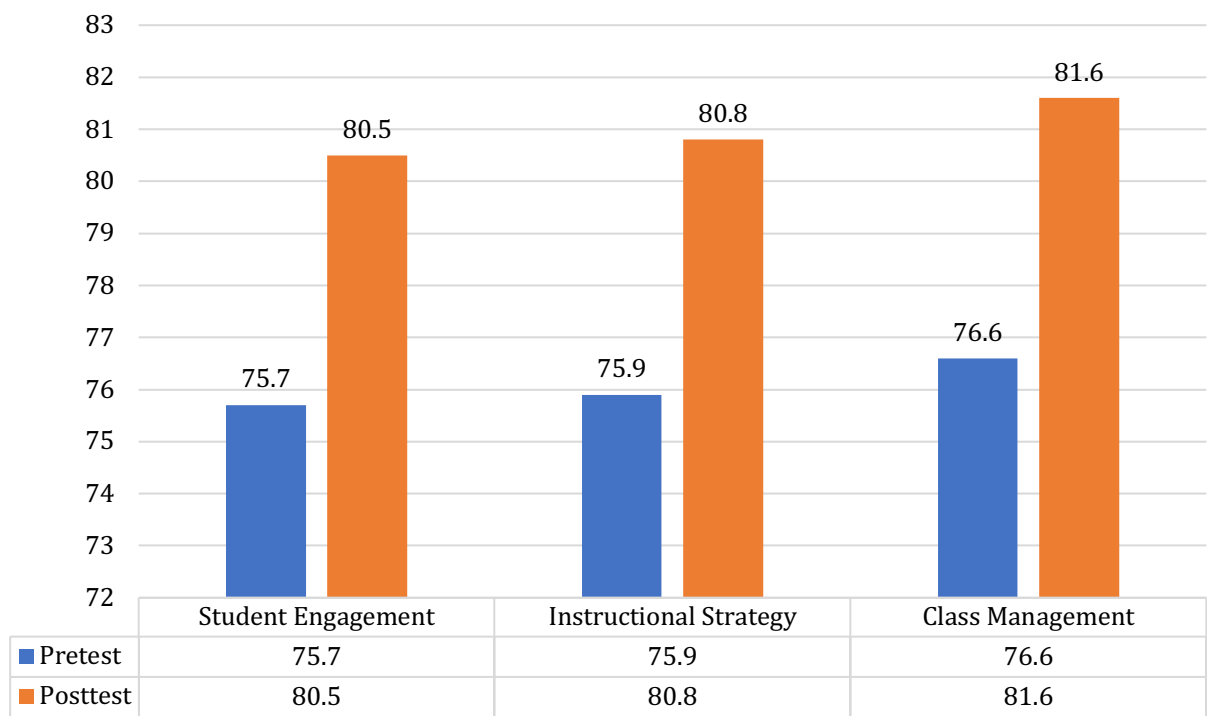


Figure 2. Increase in self-efficacy indicators

The highest increase was observed in classroom management, while the lowest was in student engagement. This indicates that students felt more confident in managing classrooms compared to engaging students. Following the DMIS intervention, students became more adept at identifying problems, designing alternative solutions, weighing consequences, and making decisions related to real classroom cases, which contributed to improvements in classroom management. This is because the DMIS component *Identifying Situations/Problems* trains pre-service teachers to be sensitive to classroom situations and to take appropriate action promptly (Botha, 2020; Daniels et al., 2021). As a result, they can confidently select and implement suitable instructional strategies, adapt methods to students' needs, and support students in understanding the subject matter. Moreover, engaging in problem identification through direct experience or video-based analysis helps bridge the gap between theoretical knowledge and practical teaching skills. Such experiences enable pre-service teachers to practice real-time decision-making, which in turn strengthens their capacity to manage classrooms effectively (Baran et al., 2023; Lucas, 2025). This finding is consistent with (McCain, 2017), who emphasized that teacher self-efficacy strongly influences classroom management practices such as relationship building, flexibility, goal communication, and the ability to make a meaningful impact. Alibakhshi et al (2020) highlighted three essential effects of improved teacher self-efficacy: managing student behavior, supporting students with special needs, and fostering positive interpersonal relationships (Alibakhshi et al., 2020).

For the instructional strategies indicator, the increase from pretest to post-test suggests that pre-service teachers developed greater confidence in selecting and implementing appropriate teaching strategies, adapting methods to students' needs, and supporting students' understanding of the content. This improvement in their ability to determine instructional strategies may be attributed to the fact that,

during the learning process, pre-service teachers strengthened their problem-identification skills in line with the DMIS component, enabling them to select strategies aligned with instructional goals (Levickis et al., 2025). In addition, the selection of appropriate strategies was also supported by activities focused on generating alternatives and evaluating consequences. These activities help pre-service teachers critically appraise their instructional decisions and make necessary adjustments (Karlström & Hamza, 2019).

Student engagement can be positively influenced by the DMIS component of evaluating consequences, which can increase pre-service teachers' confidence in fostering student motivation (Nduagbo & Casale, 2023). This is because reflective activities related to teaching and problem-solving can enhance pre-service teachers' understanding and application of motivational strategies (Jonathans et al., 2025). However, despite this positive contribution, student engagement showed the least improvement among the self-efficacy indicators. This may be attributed to the fact that student engagement requires intensive training and direct teaching experience. Belief in student engagement may not be strengthened solely through theoretical decision-making but also requires effective communication strategies and strong interpersonal relationships. A recent systematic literature review confirmed that multiple factors influence the relationship between teacher support and student engagement, suggesting that student engagement depends not only on teachers' decision-making strategies but also on addressing students' emotional and motivational needs (Prananto et al., 2025). These findings underscore the importance of providing greater attention to strengthening the student engagement indicator. To further clarify the relationship between each phase of DMIS implementation and the development of pre-service biology teachers' confidence, the contributions of DMIS to the improvement of self-efficacy indicators are presented in Table 5.

Table 5.
Relationship Between Each Phase Of DMIS And Self-Efficacy Indicators

DMIS Components	Self-Efficacy Indicators	Linkages
Identifying Situations/Problems	Student Engagement	Identifying problems helps pre-service teachers understand students' challenges, thereby fostering greater engagement.
	Classroom Management	Recognizing behavioral issues enables pre-service teachers to manage classrooms more effectively.
	Instructional Strategies	Problem identification raises awareness of teacher-student boundaries, guiding the selection of appropriate teaching strategies.
Clarifying Goals	Student Engagement	Pre-service teachers who regularly set goals can motivate students, enhancing engagement.
	Classroom Management	Clear goal setting helps pre-service teachers organize classrooms, ensuring orderliness.
	Instructional Strategies	Explicit goal setting enables teachers to determine suitable instructional strategies.
Generating Alternatives	Student Engagement	Formulating alternatives during instruction increases student involvement.
	Classroom Management	Flexibility in management methods reduces classroom disruptions.
	Instructional Strategies	Developing alternatives enables teachers to adapt strategies, making learning more effective and engaging.
Evaluating Consequences	Student Engagement	Evaluating consequences allows teachers to assess the extent of student participation.
	Classroom Management	Considering potential consequences supports more effective classroom management.
	Instructional Strategies	Evaluation assists in selecting strategies aligned with specific student characteristics.
Making Decisions	Student Engagement	Confidence in decision-making enables teachers to re-engage previously disengaged students.
	Classroom Management	Decisive classroom management fosters a well-organized environment with minimal disruptions.
	Instructional Strategies	Sound decision-making strengthens teachers' confidence in choosing strategies appropriate for each class.

Overall, [Table 5](#) illustrates that each stage of the DMIS works collectively to enhance the self-efficacy of biology education students. Initial skills in identifying problems and setting goals can build prospective teachers' readiness, making them more confident in managing their classes effectively. The long-term impact is that they are able to prepare various alternative solutions to address dynamic classroom situations. Through this exercise, prospective teachers are expected to become accustomed to continually evaluating their learning strategies until they are able to make the most appropriate decision. Other research confirms that decision-making and self-efficacy have a strong positive relationship (Defriyanto & Sugiharta, [2020](#)).

After presenting the quantitative data demonstrating a significant effect of the DMIS intervention, interviews were conducted to gather nuanced reflections from students. The interview data were analyzed using thematic analysis following Braun and Clarke ([2006](#)) six-phase procedure. During the analysis, three key themes emerged regarding DMIS as a practical approach to enhancing pre-service teachers' self-efficacy: (1) developing decision-making competence, (2) shifting from theoretical to reflective practice, and (3) mastery of pedagogical knowledge. Consistent with an explanatory sequential mixed-methods design, the qualitative phase aimed for depth of insight rather than broad representativeness. Together, these findings provide explanatory insight into the quantitative results by demonstrating how DMIS supports the development of students' self-efficacy through structured cognitive scaffolding.

Theme 1: Developing Decision-Making Competence

This theme aligns with the quantitative findings: DMIS provides essential opportunities for students to practice systematic decision-making. Preservice teacher described how the DMIS framework encouraged them to think critically, evaluate alternatives, and consider multiple perspectives.

"For instance, if there is a problem, we look at the consequences and determine the best solution." (Student A)

"From that table, we can see which choice is the most worth it." (Student B)

"Now, when making a decision, it isn't just random." (Student C)

These reflections imply that DMIS strengthens students' confidence by equipping them with a systematic thinking process. It trains preservice teacher to move away from impulsive reactions and toward rational, consequentialist reasoning. This is consistent with studies in nursing education where preservice teacher reported that structured interventions increased their self-efficacy in selecting and organizing evidence-based information (Baarends et al., [2017](#)). Similarly, Van der Scheer and Visscher ([2016](#)) found that decision-making interventions positively influenced teachers' professional confidence, particularly in instructional strategies. In addition, training students in decision-making processes can support deeper reasoning and encourage them to make decisions grounded in robust information (Oo et al., [2021](#)). By integrating task analysis with decision-making, DMIS strengthens competence by helping students select appropriate strategies before committing to a final decision (Weyers et al., [2024](#)).

Theme 2: Shifting from Theoretical to Reflective Practice

The second finding indicates that the DMIS intervention facilitates a shift from abstract theory to reflective practice. Preservice teacher consistently described being encouraged to position themselves as professionals when analyzing instructional cases. Despite being conducted in a classroom setting, the DMIS case studies forced a mental simulation of professional teaching.

"I was trained on how to respond when I eventually start teaching." (Student D)

"I learned to put myself in the teacher's shoes if I were to face a case like that." (Student C)

This theme highlights a readiness for practice-based learning. DMIS trains students to deepen their understanding of the teacher's role, especially in addressing student problems and evaluating potential solutions. Consequently, students become accustomed to professional positioning, which fosters confidence in their communication and pedagogical skills. This aligns with Marschall ([2022](#)) claim that decision-making training, especially in instructional contexts, supports teacher self-efficacy by empowering critical thinking in selecting solutions for classroom challenges. Moreover, collaborative evaluation of instructional problems fosters professional dispositions (Rothe & Göbel, [2024](#)), enabling pre-service teachers to connect prior learning with current approaches to enhance engagement

(Hartmann et al., 2025).

Theme 3: Mastery of Pedagogical Knowledge

The third finding reveals that DMIS promotes confidence through the mastery of pedagogical knowledge. Students reported increased preparedness to address varied learning needs after engaging with authentic DMIS-based scenarios.

"I can't just look at it from one perspective anymore." (Student D)

"I now know how to deal with different types of students." (Student E)

"I used to be clueless... after this course, I gained the knowledge on how to handle such students." (Student A)

"I am more confident because I understand the environmental and genetic factors affecting students." (Student B)

This pedagogical and psychological knowledge functions as cognitive mastery, reinforcing students' beliefs in their professional readiness. DMIS encourages empathy and pedagogical sensitivity by situating students in realistic dilemmas, thereby strengthening their ability to manage heterogeneous classrooms. This resonates with findings from the UK, where case-scenario interventions provided valuable exposure to challenging situations and fostered reflection on decisions encountered during teaching placements (Klassen et al., 2021). Recent evidence also emphasizes that robust pedagogical knowledge serves as a crucial source of teacher self-efficacy (Bakker et al., 2024; Morris et al., 2017).

CONCLUSION

This research evaluated the effect of the Decision-Making Instructional Sequence (DMIS) on pre-service teachers' self-efficacy. The results of the paired-samples t-test revealed a statistically significant increase in self-efficacy following the intervention ($p < 0.05$), indicating that DMIS effectively strengthened students' confidence in their professional capabilities. These quantitative results were supported by thematic analysis, which identified three key themes: developing decision-making competence, shifting from theoretical to reflective practice, and mastery of pedagogical knowledge. Together, these findings suggest that the DMIS intervention contributes significantly to the development of pedagogical competence and reflective awareness among pre-service teachers. The implication of this study is that teacher education curricula should prioritize the integration of scenario-based decision-making strategies as a precursor to field placements. By providing students with simulated professional challenges, programs can better equip them for the complexities of real-world classrooms.

Despite these contributions, this study utilized a pre-experimental design with a limited qualitative sample; therefore, the findings should be interpreted with caution. Future research is recommended to employ rigorous quasi-experimental or experimental designs involving larger and more diverse cohorts. Further longitudinal studies are also needed to validate the long-term impact of DMIS on teacher self-efficacy and professional performance within broader global teacher education contexts.

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