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Best Practices for Enhancing Student Metacognitive Skills through Innovative Teaching Strategies

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Abstract

In this study, effective, efficient, and impractical method of cultivating metacognition in learners, such as strategy, difficulty level, and feedback system, are investigated as part of a qualitative analysis. Using semi structured interviews, focus group discussion and classroom observation research data was collected from 15 educators and 30 students of different class levels. Thematic analysis was employed to identify patterns, resulting in four key themes: these issues as metacognitive strategies, students' engagement, factors inhibiting implementation of metacognition strategies, and feedback. The research presented in this paper shows that the approaches which foster guided reflection, self- assessment, peer cooperation, as well as the forms of scaffolded learning have a positive impact on the development of metacognitive skills. Teachers also insisted that feedback is useful as a metacognitive strategy for enhancing students' thinking skills and raising autonomy levels. Nevertheless, some constraints including restricted time for instructions, fixed curriculum and diverse students' learning achievements were reported as the factors which hinder the proper utilization of these strategies. The study filled the gap identified in the literature review by offering concrete, contextualised suggestions on how metacognition may be enacted in a specific institutional and timetabled context, as well as how students may be supported in terms of the institutional structures necessary for metacognition to flourish. This provides further evidence of the need for preservice and inservice teacher education and professional development, curriculum accommodation, and creation of equitable learning environments to promote metacognition across learner contexts. This work further enriches the discussion on metacognition by drawing attention to specific practical approaches and underlining the importance of continuing support mechanisms in learning.

Introduction

Meta cognition can be defined as 'cognitive approach that involves being conscious of and managing one's own learning activities. Among the characteristics of metacognition that have attracted significant interest of researchers is the view on metacognition as a set of skills that enable learners to understand, observe, and optimise their cognitive activities (Sato, 2022). As the concept of education is evolving toward learning outcomes rich with analysis and critical thinking, metacognition has emerged as one of the core aspects in learning success. Education scholars have postulated that metacognition is not only useful for achieving good academic results, but also crucial for later success in learning throughout the years. the enhancement of

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metacognitive skills of learners has not received much attention in terms of research as well as in the search for the best practice for the facilitators.

Over the last few decades, both nationally and internationally, metacognition in educational context has been supported by empirical research across subject areas. Based on Rivas et al. (2022), metacognition is a greater ability to determine what learners do not understand or know, decide on the best way to learn the material, and think about the learning process. This results in increased performance in academics since all the elements are presented holistically. metacognitive skills play crucial role in regulating own learning and students' abilities to plan, to control their learning processes and to reflect on their learning outcomes (Teng, 2020). Not only are self-regulated learners more independent with their learning but they are also better able to persevere in the face of difficulties (Akcaoğlu et al., 2023).

There is a wealth of empirical knowledge demonstrating the benefits of metacognition in teaching-learning processes into which educationists encounter numerous difficulties in implementing metacognitive approaches. Teachers complain that they are not knowledgeable about how to teach metacognition (Suminto & Mbato, 2020), and there is seldom time and resources to engage in metacognitive training. Besides, students themselves may not be aware of the other metacognitive strategies that can improve learning and therefore, practice in such areas may be sparse (Marantika, 2021). Such difficulties point to the desirability of investigating not only how effective strategies for the cultivation of metacognition might be but also how the obstacles to their application can be overcome.

Education and development metacognitively are not a linear model fit for all. In consequence, the efficiency of the metacognition strategies under consideration can be rather different depending on the age, the learning environment, or the studied material, of the learners involved. in learning that is done at the primary education level using multimedia dequisition, young learners may follow more compounded and direct learning to enable the development of metacognitive awareness compared with older students who may best be advised to use self-regulate learning approaches that embrace reflection and goal setting (Abdulrahaman et al., 2020). research-specific interventions may be used to meet the needs of various subject areas that are different from each other. metacognition strategies related to mathematics may not be the same as the metacognition strategies related to humanities or sciences (Cervin et al., 2021). It is important to appreciate these variations in the context of Aot to build functional and contextually-based interventions for metacognition for various learning environments.

Of the potential approaches to enhance the development of metacognitive skills one of the most effective seems to be implementation of metacognitive prompts and reflective practices into curricula. The studies identified have revealed that implementation of strategy instruction, for example, self-questioning, summarizing and self-explanatory activities can greatly enhance students' metacognition and learning (Daniel & Williams, 2021). Additionally, the design for group learning and offering feedback from peers can give the learners a good chance to express and even enhance the metacognitive experiences on his/her own. speaking groups are such that members can monitor the strategies used by other learners, in this case discover new methods and or improve on their strategies.

The second of these is the important aspect of formative assessment when learning metacognitive skills. Studies show that students scanned their low stakes tests and focused on the feedback when it was given in the form of frequent, routine quizzes without high stakes consequences (Casselman, 2021). Such assessments not only serve the purpose of finding out students' learning profiles but also enhance metacognition in that students are required to reflect on how they learn what (Costa et al., 2020). The application of rubrics, self-and peer

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assessments may also improve this process by offering students difficult criteria for their works and make them look at their progress from the outside.

While the role of metacognition has been researched extensively there is little literature concerning the best way of employing it in teaching. Despite the many attempts at defining effective metacognitive practices, very little research has been carried out to explain how such practices can be incorporated into teaching practices. there is a scarcity of data on how educators provide challenges that are unique in their pursuit to foster metacognitive skills and how the challenges may be solved. Therefore, this research aims to identify and examine strategies for teaching metacognition to learners with a view of identifying the desirable strategies as well as the obstacles to the integration of the strategies in classroom practice and how these can be overcome.

The outcomes of this study will extend the knowledge base on metacognition, particularly in the context of technology-enhanced learning environments, and offer specific guidelines to those teachers interested in integrating metacognitive approaches to their teaching. With regard to the goal of the article, this study focuses on established insights concerning metacognition fostering and contributes to the development of adequate educational contexts that would help the learner become more self-regulated as well as self-reflecting.

Methods

The qualitative research design chosen in this study aimed at identifying how metacognitive skills were fostered in students as seen by educators and students. Exploratory/contextual approaches let us get a wide understanding of the participation and action patterns of the participants, thus, offering detailed and profound analysis of how metacognition is cultivated in learning environment (Ashtari et al., 2023). The strategy used in the study's design attempted to mitigate this lack of knowledge regarding the process by which teachers and students use the strategies and incorporate such strategies into meaningful classroom experiences. Due to the specifics of metacognitive development as a multifaceted and highly individual process, only qualitative methods were sufficiently easy to capture the specifics of these experiences.

Sample selection was purposive in a way that only subjects who would yield relevant data for the development of metacognitive skills were selected. In sum, 15 teachers were the sample selected for this study, from different levels of education, including elementary, middle, and high school teachers. These educators were selected purposely due to their prior implication in teaching ME skills to their students hence the data obtained is diverse in nature and practice across various Institutions 30 students were involved in the study but selected from these educators' classes which they expected the students to have had previous experience on metacognitive activities. This sample of students proved useful to some extent to capture a range of low, moderate, and high use of metacognition, disparate age, and academic level.

To gather comprehensive data, the study employed three main data collection methods: semi-structured interviews with educators, focus group discussions with students, and classroom observations. The semi-structured interviews provided educators with an opportunity to reflect on their teaching practices and share their experiences and challenges in fostering metacognitive skills. The open-ended nature of the interview questions allowed educators to discuss the strategies they used, how they perceived their students' engagement with these strategies, and any obstacles they encountered in implementing metacognitive practices. The focus group discussions with students allowed the researcher to gain insight into how students perceived and engaged with metacognitive strategies in their learning process. These discussions also facilitated a deeper understanding of the students' challenges in applying metacognitive techniques and their overall attitudes toward the strategies employed in the

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classroom. Finally, classroom observations were conducted to observe firsthand how educators integrated metacognitive practices into their lessons and how students interacted with these strategies in real-time learning environments.

Data analysis was carried out using a thematic analysis approach, which is particularly suited for identifying patterns and themes within qualitative data. The analysis process involved several stages, starting with the transcription of interviews and focus group discussions. This allowed the researcher to immerse themselves in the data and identify recurring concepts related to metacognition, such as "self-regulated learning," "reflection," and "peer collaboration." The researcher then used open coding to categorize these concepts and identify specific practices and challenges reported by both educators and students. As the analysis progressed, several themes emerged, including "Effective Metacognitive Strategies," "Student Engagement with Metacognition," "Barriers to Implementation," and "Role of Feedback in Metacognitive Development." These themes were further refined through iterative readings of the data, ensuring that the findings were both comprehensive and representative of the participants' experiences.

The credibility and validity of the findings were enhanced through the use of triangulation. By comparing data from different sources interviews, focus groups, and classroom observations the researcher was able to cross-check the consistency of the findings and ensure that they were not biased by a single data collection method. Triangulation is particularly valuable in qualitative research, as it helps to strengthen the validity of the findings by providing a more comprehensive view of the phenomenon being studied. This process of triangulation allowed for a more nuanced understanding of the best practices in developing metacognitive skills, as it integrated multiple perspectives and data sources, providing a well-rounded view of the subject.

Result and Discussion

Metacognition is crucial for students' individual learning regulation, their thinking analysis and their strategies adaptation for achieving academic objectives. These skills include planning, monitoring and the ability to evaluate learning—an essential corner piece in nurturing independent and lifelong learners. Yet, the application of metacognitive strategies in classroom learning environments presents real difficulties: (1) Often teachers are not trained in how to use metacognitive strategies; (2) the use of metacognitive strategies may reject the formal curricula; (3) it is difficult to address learners at different levels of readiness simultaneously. In light of these gaps, this paper sought to identify the best practices used by educators in fostering metacognition skills; the use of feedback in metacognition and challenges that are likely to be realised during the processes. The results extend the knowledge of implementing metacognition within various learning environments and highlight possibilities that can help overcome barriers toward encouraging a more reflective mode of learnership. Below, the results are presented in four key themes: key issues in using metacognitive strategies, how to engage students, challenges of implementing metacognition strategies and the significance of feedback.

Effective Metacognitive Strategies

The study revealed that educators employed a variety of effective metacognitive strategies to help students develop self-regulation and critical thinking skills. Among the most widely used strategies were think-alouds, reflective journals, goal-setting, and self-monitoring techniques. These strategies not only enhanced students' awareness of their cognitive processes but also fostered independent learning by teaching students how to control and monitor their own learning strategies.

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One of the key strategies reported by educators was the use of think-alouds, where teachers verbalized their thought processes while solving problems or engaging in tasks. This strategy helped students to see how experienced learners approach challenges and make decisions. By thinking aloud, educators modeled the mental steps involved in complex tasks, enabling students to understand the cognitive strategies behind problem-solving. As one educator noted during an interview,

> *"I find that when I do think-alouds, students get more comfortable with the process of breaking down problems. They begin to recognize the steps they need to take in their own thinking."*

This approach was especially effective in subjects that involved problem-solving, such as mathematics and science, where the thought process behind each solution can often be more complex than the final answer itself.

Another highly effective strategy identified in the study was the use of reflective journals. Educators encouraged students to write regularly about their learning experiences, including their thought processes, strategies, challenges, and solutions. Reflective journaling was particularly successful in promoting self-awareness and fostering a habit of introspection among students. It allowed students to track their progress and reflect on how they could improve their learning strategies over time. One student shared in a focus group,

> *"Writing in my journal helps me see what I did wrong in a test or homework, and then I can think about what I can do next time to do better. It makes me more aware of how I learn."*

Through this process, students became more conscious of their learning habits and more likely to adjust their strategies based on their reflections.

Goal-setting and self-monitoring were also essential components of metacognitive development. Educators frequently set opportunities for students to set personal learning goals, assess their own progress, and adjust strategies as needed. Goal-setting provided students with a clear direction for their learning, while self-monitoring helped them evaluate their success and identify areas for improvement. One educator explained,

> *"I encourage my students to set small goals for each lesson. This way, they can track their own progress and see how they are improving over time. It's a way for them to take ownership of their learning."*

By integrating goal-setting into daily lessons, students were not only able to stay focused on the task at hand but also learned how to monitor their own learning outcomes, a key aspect of metacognitive development.

In addition to individual strategies, peer collaboration emerged as another effective metacognitive practice. Many educators used group activities to encourage students to reflect on their learning and share their cognitive processes with each other. Peer collaboration allowed students to learn from one another's thought processes and provided opportunities to refine their metacognitive strategies. One educator stated,

> *"I find that peer discussions help students articulate their thinking and learn from each other's strategies. Sometimes they understand a concept better when a classmate explains it in their own words."*

Peer collaboration not only reinforced the metacognitive skills of students but also fostered a sense of community in the classroom, where students felt more supported in their learning journey.

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These strategies were found to be effective in various educational settings, from elementary to high school, and across different subject areas. Educators emphasized the importance of consistent practice and integration of metacognitive strategies into daily instruction, as they believed that metacognition is a skill that develops over time with continuous reflection and practice. The strategies mentioned above were particularly impactful in fostering self-regulated learners, who were able to take control of their own learning, monitor their progress, and adapt their strategies for better academic outcomes.

Student Engagement with Metacognitive Practices

The findings highlighted the significant role of student engagement in the success of metacognitive practices. Engaged students demonstrated active participation in activities designed to enhance their metacognitive skills, including reflective journaling, peer collaboration, and self-assessment exercises. Their involvement was instrumental in fostering an environment where metacognitive strategies could thrive, leading to improved academic performance and greater independence in learning.

One of the most impactful forms of student engagement was their participation in reflective journaling activities. Through reflective journaling, students were encouraged to document their learning processes, challenges, and accomplishments, which helped them develop a deeper understanding of their own cognitive strategies. Students who actively engaged in journaling reported improved clarity in identifying their strengths and areas for improvement. As one student expressed during a focus group,

> *"When I write about what worked and what didn't, it helps me think about how I can do things differently next time. It's like I'm learning how to learn better."*

Educators observed that consistent engagement with reflective journaling led students to become more self-aware and proactive in making adjustments to their learning approaches.

Peer collaboration was another area where student engagement played a crucial role. Activities that required students to work together, such as group discussions or joint problem-solving tasks, provided opportunities for them to share their thought processes and learn from each other's strategies. Students who actively participated in these collaborative settings often demonstrated higher levels of engagement and motivation. One educator shared in an interview,

> *"I've noticed that students who engage in group work become more confident in explaining their thought processes. They also learn alternative approaches from their peers, which helps them refine their own strategies."*

This engagement not only reinforced the students' metacognitive skills but also fostered a collaborative learning environment where mutual support enhanced their ability to self-regulate and reflect on their learning.

Students also showed high levels of engagement during self-assessment activities, where they were required to evaluate their own learning and set personal goals. Those who actively participated in these practices demonstrated greater accountability for their academic progress. One student remarked,

> *"When we rate ourselves after a lesson, I feel like I can see exactly where I need to improve. It's not just about the grade; it's about figuring out what I need to do better."*

This form of engagement encouraged students to take ownership of their learning, a key aspect of developing metacognitive skills. Educators noted that students who were engaged in self-

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assessment activities often displayed higher levels of motivation and persistence in achieving their learning goals.

The study also identified a positive correlation between student engagement and metacognitive development in classrooms that promoted open discussions about cognitive processes. Students who actively participated in these discussions were more likely to develop metacognitive skills, such as planning, monitoring, and evaluating their learning strategies. One educator explained,

> *"I make it a point to involve students in conversations about how they approach their tasks. Those who engage in these discussions tend to become more reflective and deliberate in their learning."*

Such engagement allowed students to internalize metacognitive practices, making them an integral part of their learning process.

Finally, the level of student engagement was influenced by the extent to which educators tailored metacognitive practices to suit the students' needs and learning styles. Personalized approaches, such as allowing students to choose their reflective journaling topics or adapt group work roles, led to greater participation and enthusiasm for metacognitive activities. One student commented,

> *"I like it when we get to decide how we want to reflect on our work. It makes me feel like my learning is more about me and what I need."*

This sense of autonomy not only enhanced engagement but also strengthened the students' ability to self-regulate and adapt their learning strategies effectively.

Overall, student engagement was a critical factor in the success of metacognitive practices. When students were actively involved in reflective, collaborative, and self-assessment activities, they demonstrated a stronger ability to monitor and adapt their learning processes. This engagement was fostered through a combination of teacher-led initiatives, peer interactions, and opportunities for self-directed learning, ultimately contributing to the development of independent, self-regulated learners.

Barriers to Implementing Metacognitive Strategies

Despite the significant benefits of metacognitive strategies, educators encountered several barriers to their implementation. These challenges stemmed from factors such as limited teacher training, time constraints, lack of student readiness, and varying levels of institutional support. Addressing these barriers is crucial to ensure the successful integration of metacognitive practices in educational settings.

Limited teacher training was one of the most frequently reported barriers. Many educators expressed that they lacked the necessary training to effectively implement metacognitive strategies in their classrooms. They highlighted the need for professional development programs that focus specifically on designing and facilitating activities aimed at enhancing metacognitive skills. One educator shared,

> *"We were never formally trained to teach metacognition. I had to learn through trial and error, and sometimes I'm not sure if I'm doing it right."*

This lack of training left many teachers feeling unprepared to integrate metacognitive strategies into their teaching practices, limiting their ability to fully support students in developing these skills.

Time constraints also posed a significant barrier to the implementation of metacognitive strategies. Teachers reported that the rigid structure of school curricula and the pressure to

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cover extensive content left little room for incorporating reflective activities or discussions about learning processes. One educator remarked,

> "*There's just so much content to get through that it's hard to find time for metacognitive exercises. Sometimes it feels like a luxury we can't afford."*

As a result, opportunities for students to engage in metacognitive practices were often sacrificed in favor of meeting curriculum demands, which impacted the depth and consistency of these practices.

Another barrier identified was lack of student readiness for engaging with metacognitive strategies. Educators noted that some students struggled to grasp the concept of metacognition or were resistant to engaging in reflective activities. This was particularly evident in younger students or those who were unaccustomed to actively analyzing their thought processes. One teacher explained,

> *"Many of my students don't understand why they need to reflect on their learning. They think it's just extra work, and it's hard to change that mindset."*

Overcoming this resistance required additional effort from educators to build students' awareness of the benefits of metacognition, which further strained already limited classroom time.

Institutional support was another critical factor affecting the successful implementation of metacognitive strategies. Teachers often reported that their schools did not provide sufficient resources or create an environment conducive to fostering metacognition. For instance, a lack of access to professional development opportunities, limited teaching aids, and insufficient encouragement from school leadership were commonly cited issues. As one educator noted,

> *"We don't get the support we need from the administration. There's no emphasis on teaching metacognition, and it feels like we're on our own."*

This lack of institutional support hindered the development of a consistent and sustainable approach to integrating metacognitive practices across classrooms.

Lastly, educators highlighted the challenge of assessing metacognitive skills, which added another layer of difficulty to implementation. Unlike traditional academic skills that can be easily measured through tests and assignments, metacognitive skills are inherently more abstract and subjective. Teachers expressed uncertainty about how to evaluate students' progress in developing these skills. One participant shared,

> *"It's hard to measure metacognition. I can see when students are engaging with the strategies, but putting a grade on it feels impossible."*

This challenge often discouraged teachers from dedicating time to metacognitive practices, as they struggled to balance these activities with more quantifiable aspects of the curriculum.

Feedback played a central role in enhancing metacognitive development among students, as it provided valuable insights into their learning processes and helped refine their self-regulatory skills. The findings revealed that both teacher-provided and peer-to-peer feedback were instrumental in fostering students' ability to reflect on their learning, set realistic goals, and improve their problem-solving strategies.

Teacher-provided feedback emerged as a significant enabler of metacognitive development. Educators highlighted the importance of offering specific, constructive feedback to guide students in evaluating their learning approaches. Teachers emphasized how feedback could

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help students recognize their strengths and weaknesses, prompting them to adjust their strategies for better outcomes. As one educator explained,

> *"When I provide feedback, I focus on asking questions like, 'What do you think worked well in your approach? What could you do differently next time?' This gets them thinking about their own processes."*

Such feedback encouraged students to engage in deeper reflection, leading to more intentional and informed decision-making in their learning.

Additionally, the timing and quality of feedback significantly influenced its effectiveness. Teachers observed that immediate and actionable feedback was more impactful, as it allowed students to connect their reflections to their learning activities in real time. One participant noted,

> *"Feedback needs to be timely. If we wait too long, students lose the connection between the feedback and their actions."*

High-quality feedback, characterized by its clarity, relevance, and alignment with students' learning goals, was critical in promoting metacognitive awareness.

Peer-to-peer feedback was another effective strategy for fostering metacognition, as it enabled students to engage in collaborative reflection and learn from diverse perspectives. Educators reported that peer feedback activities encouraged students to articulate their thought processes, compare strategies, and identify areas for improvement. One student shared during a focus group discussion,

> *"When my classmates give feedback, I realize things I didn't notice before, like how I can approach a problem differently."*

This collaborative exchange not only deepened students' understanding of their learning but also enhanced their communication and critical thinking skills, which are integral to metacognition.

Moreover, feedback served as a tool for promoting goal-setting and self-monitoring among students. Teachers used feedback sessions to help students establish clear, achievable goals and track their progress over time. This practice empowered students to take ownership of their learning and develop a sense of accountability. As one educator explained,

> *"I often ask my students to set specific goals after receiving feedback, and we revisit those goals in the next session to see how they've progressed."*

This iterative process reinforced students' ability to self-regulate and adapt their strategies to achieve desired outcomes.

However, the findings also highlighted challenges in utilizing feedback effectively. Teachers noted that some students initially struggled to receive feedback constructively, viewing it as criticism rather than an opportunity for growth. Educators emphasized the importance of creating a supportive classroom environment where feedback was framed positively and students were encouraged to see it as a valuable learning tool. One teacher remarked,

> *"It takes time to build a culture where students see feedback as helpful instead of feeling discouraged. But once they understand its value, it transforms how they approach learning."*

This study explored best practices for developing metacognitive skills in students, addressing a significant gap in the literature regarding the practical implementation of strategies that foster metacognition in diverse classroom contexts. Previous research has often focused on the

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theoretical benefits of metacognitive development (Azevedo, 2020) or its role in improving academic outcomes (Whitebread & Neale, 2020). limited studies have provided in-depth, qualitative insights into how these strategies are applied in real-world settings and the barriers educators face in their implementation. This study contributes to the literature by presenting evidence-based practices and emphasizing the roles of feedback, student engagement, and context-specific challenges, thereby addressing existing gaps.

A notable asset of this research Endeavour is therefore the finding of concrete tangible approaches that teachers employ in developing metacognition. Unlike the previous studies, which some of them have no suggested plans of implementation, this study provides knowledge on how reflective questioning, modeling or team learning are useful in developing metacognition in learners. the results are in congruity with McDaniel & Einstein (2020) framework according to which the students ought to be taught to learn the skills of planning, monitoring, and assessing their learning. But more importantly, this study builds on these insights by showing how these strategies factor age and learning contexts.

This study also provides evidence on the contribution of feedback on metacognition which is a factor that has been overlooked in the past literature (Muijs & Bokhove, 2020). The evidence presented in the present study indicates that feedback is an effective mean to support reflections on the processes of learning and on how to improve these processes on the part of students as well as teachers. In view of these dsfindings, this study further articulates the notion of metacognition through adding value to the existing models and concurrently presents outlooks on applying feedback in classrooms.

Although Wong & Liem (2022) has pointed out that student engagement has received significant theoretical attention as an important context for promoting metacognition, few empirical investigations have focused on how to support engagement in practice. This study fills this gap by illustrating how the general approaches like peer learning and guided metacognition can foster participation. qualified insights included students' appreciation of peer feedback because it made them to better understand issues from different perspectives, and improve their problem-solving skills as deduced from focus group data.

In this research, lecture-student interaction is underscored as the way that engulfs student participation in class while asserting the impossibility of excellent teaching without culturally appropriate approaches. Earlier studies have mainly lacked perspectives on how metacognition is implemented in specific contexts more so the non-Western educational contexts (Mazancieux et al., 2023). This study thus extends the understanding of how the engagement strategies can be implemented across participants of different educational levels and cultural backgrounds.

This paper makes another significant theoretical contribution by examining the challenges more experienced in using metacognitive strategies because this is a subject that has elicited little research interest. Compared to previous works, like Cheng & Chan (2021). that and pointed out that teaching metacognition can be challenging, this paper discusses the practical problems in detail, and mentions such factors as time limitation, students' readiness level and their reluctance towards feedback.

The analysis presented here shows that these obstacles may have their roots in system constraints including the prescriptive nature of curriculum and limited teacher professional development. This is in conformity with recent voices that need more supportive institutional structures in geared toward the embedding of metacognitive activities in routinized instructions (Satterstrom et al., 2021). This paper provides practical implications that can be beneficial to policymakers and educators, including the implementation of metacognitive training within the

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contexts of teacher education and the development of adaptive learning environments which reflect on difficulties.

By extending the focus of the study to the effects of feedback, a new perspective is introduced to the metacognition discussion. Although other literature has suggested feedback to improve learning outcomes (Stanton et al., 2021), relatively few before addressed the question of how feedback fosters the development of metacognitive skills for specific subjects. This paper also proves that feedback is not only useful in assessing the learning processes, but also for promoting reflections and self-regulatory behaviours.

According to the results, feedback provided to the students on time and provided in a constructive form motivates them to take the full responsibility for their learning activities, which is compliant with the concept of self-determination theory by Malecka & Boud (2023). the submission of students' work to their peers as a means of collaboration as a fruitful perspective on how social activities contribute to metacognition, thus supported by Sundgren & Jaldemark (2020) socio-cultural theory of learning.

This study fills the existing gap between a theoretical conceptualization of metacognition and an operational one in classrooms. Although the knowledge-based models as Varpio et al. (2020) have contributed to establish a conceptual framework, they have mainly not offered practical clues on how to put the principles into classroom practices in different educational settings. Thus, this research provides a practical template for teaching how teachers might distinctively facilitate metacognitive strategies, making a constructive contribution to the continuous discussion of ways that educator practices may be enhanced.

This study has practical implications for future research as well as applied practice (Luo et al., 2021). Further research in the area should attempt to examine how the strategies unearthed in this research can be implemented at other levels of education as well as across other education systems. Further, there is a great need for the longitudinal studies to establish the effects postsecondary institution practices have in the students' later lives. To the practitioners, the study suggests that there is need to develop professional development that directs the teachers how to enhance metacognition among students.

Conclusion

The findings of present study can be beneficial to enhance the process of metacognitive skill in students, particularly reflective strategies, feedback, and active students' participation. As filling important gaps in the currently available meta-analysis, it not only demonstrates valuable strategies that can be employed by educators to foster metacognition for learning, including peer learning, metacognitive contingency prompts, and feedback, but also reveal contextual limitations such as limited time and flexible curriculum. The results raise awareness about the need for appropriate ES and PD activities that facilitate proactively appropriate institutional support to educators who in turn can then incorporate these approaches successfully. Finally, this study brings to the knowledge of the external world on how metacognitive practices could be incorporated in various learning settings and creates a foundation for construction of more integrative and adaptive learning milieu.

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