The International Journal of Indian Psychology
ISSN 2348-5396 (Online) | ISSN: 2349-3429 (Print)
Volume 13, Issue 2, April- June, 2025
DIP: 18.01.289.20251302, DOI: 10.25215/1302.289
https://www.ijip.in

Research Paper

Teacher as Metacognitive Professional: A Perspective

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ABSTRACT

The study examines the concept of teachers as metacognitive professionals, highlighting their crucial role in fostering a reflective, adaptive, and effective educational environment that promotes ongoing growth for both educators and students. The study posits that teachers' metacognitive awareness, understanding their thinking processes, strategies, and instructional practices, serves as a foundation for self-regulation, reflective practice and professional growth. Using a theoretical analysis of secondary knowledge, the study highlights the significance of teachers' metacognitive awareness in improving instructional practices, fostering self-regulation, and enhancing student learning outcomes. The study discusses the essential role of professional development in enhancing teachers' metacognitive abilities, emphasizing that systemic support, policy reforms, and institutional recognition are necessary to overcome barriers such as a lack of awareness and resistance to change. The study advocates for cultivating teachers' metacognitive abilities to promote continuous professional improvement and a more responsive, learner-centred education system.

Keywords: *Metacognitive Awareness, Professionalism, Professional Development, Teacher Education*

The term 'metacognition' indicates one's cognitive process is beyond thinking and controls cognitive actions. Knowledge and views about one's cognitive processes and subsequent attempts to control those processes to optimize learning and memory are known as metacognition (Ormrod, 2006). Hacker et al. (1998) stated that learning new material or concepts and improving one's application of learning processes are common definitions of metacognition. It has been widely used and explained through different perspectives and studies. A teacher requires professional thinking strategies for their knowledge contribution process. Moreover, they demonstrate their cognitive vision through activities essential to metacognition, including writing, problem-solving, communication, reading comprehension, language acquisition, self-control, social cognition, memory, self-education, and personality development (Flavell, 1979). Thus, metacognition focuses on one's thinking and controlling mental processes, which are metacognition's main goal (Flavell, 1976). In the educational domain, developing metacognitive skills among teachers is often called teacher metacognition. Teacher metacognition has become a focal point, as

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Received: February 17, 2025; Revision Received: June 07, 2025; Accepted: June 11, 2025

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teachers' awareness of their thinking impacts their instructional practices. Schraw and Moshman (1995) have noted that a structured corpus of knowledge about one's cognition is called metacognitive knowledge. Therefore, teachers' metacognitive awareness is crucial for building an effective educational system, promoting continuous improvement, and enhancing student learning outcomes.

Background of Metacognition

Flavell first used the term 'metacognition' in the 1970s (Flavell, 1979). He is recognized for having coined the term 'metacognition'. He characterized it as the knowledge of one's cognitive processes or everything associated with them (Flavell, 1979). This marked a shift in understanding cognition, not merely as a mechanism for learning or problem-solving, but as a process that could be observed, regulated, and improved through self-awareness. According to theories surrounding metacognition, the acquisition of metacognitive knowledge begins early and continues through adolescence (Schraw & Moshman, 1995). Alexander et al. (1991) highlighted the application of metacognition and the characteristics and connections between various forms of metacognitive information and psychological processes. For this reason, when describing metacognition in research, it is essential to investigate its applications (Schunk, 2008). According to Winne (1996), more theoretical research is needed to establish a common definition and its fundamental elements. The study of metacognition gained momentum following Flavell's work, with researchers exploring its implications for learning and education. Over time, researchers have consistently emphasized the significance of metacognition in successful teaching and learning (Azizi et al., 2022). In the 1980s and 1990s, research concentrated on how metacognitive awareness influences student achievement and skill acquisition, particularly in reading comprehension, problem-solving, and memory. Researchers such as Ann Brown (1984) and Flavell (1985) contributed to the understanding of metacognitive processes in children and how these skills develop over time. Today, metacognitive research forms an integral part of various fields beyond education, including psychology, business, and even artificial intelligence.

Theories related to metacognition

The concept of the teacher as a metacognitive professional is grounded in theories of metacognition. According to Flavell's theory of metacognition (1979), as metacognitive professionals, teachers employ two elements, namely metacognitive knowledge and metacognitive regulation, to evaluate their teaching strategies, monitor their efficacy, and make necessary adjustments. Thus, metacognitive teachers continuously engage in reflective practice to ensure optimal quality in the teaching-learning process. Schön (1983) stated in the reflective practice model that teachers assess the effectiveness of their lessons and enhance their pedagogical strategies through reflection (i.e., reflection-in-action and reflection-on-action). These two types of reflection highlight the significance of professional practice by strengthening their teaching actions and experiences. Bandura (1986) emphasized in his theory of social cognition that teachers with strong self-efficacy are more likely to establish specific goals, manage their teaching strategies, and engage in metacognitive activities. This theory prioritizes the roles of self-efficacy and self-regulation in learning and behavior. By adhering to these principles, teachers can adopt the most effective teaching strategies and achieve their learning objectives. Furthermore, Vygotsky's sociocultural theory (1978) reports that teachers utilize metacognitive strategies to scaffold student learning and model reflective practices. Therefore, as discussed concerning teachers' metacognitive abilities, student learning is essential for their cognitive development and personal lives. In conclusion, this theoretical analysis provides a structured approach to understanding and developing teachers as metacognitive professionals.

Teachers' metacognitive knowledge

Metacognitive knowledge involves thinking and sensitivity to regulate and respond appropriately (Flavell, 1979). Depaepe et al. (2009) defined knowledge of cognition as metacognitive knowledge, which involves consistent information that learners have about their cognitive functioning, such as strengths and shortcomings as a problem solver, and knowing where, how, and why to use various strategies. Cross and Paris (1988) noted that cognitive knowledge and regulation can be taught. This can only occur when teachers demonstrate metacognitive strategies (Bowman et al., 2006). In addition, students of metacognitive teachers perform better in tasks requiring self-regulation (Zimmerman, 2002). Soodla et al. (2017) revealed a correlation between teachers' metacognitive knowledge and expertise. Thus, teachers' comprehension, expertise, and competencies with metacognition strategies are crucial. Therefore, metacognitive teachers have diverse opportunities and responsibilities to disseminate that knowledge through their metacognitive teaching strategies. Hartman (2001) stated that teachers' understanding of metacognition depends on their understanding of the complex interrelationships between declarative, procedural, and conditional knowledge. Schraw and Moshman (1995) categorize metacognitive knowledge into three processes. Here, these crucial processes are discussed below:

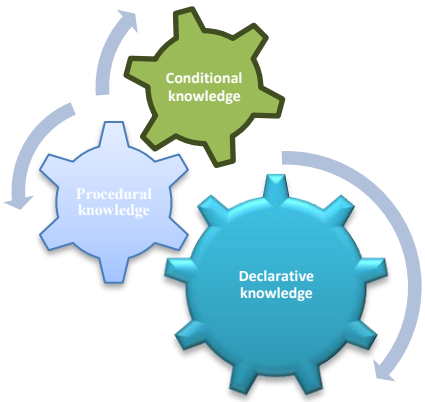

Figure 1. *Teachers' metacognitive knowledge*

- ***Declarative knowledge*****:** Memory stores declarative knowledge, also referred to as metacognitive knowledge, which includes models of cognitive functions like language, memory, and so forth (Efklides, 2008). It's an individual's understanding of cognitive techniques, abilities and skills (Schraw, 2001). The amalgamation of techniques, abilities, and skills is known as cognition (Kuhn, 2000). With declarative knowledge, people are aware of strategies that can improve their performance when finishing jobs (Hughes, 2017). Hence, a person's knowledge regarding their mental content effectively operates cognitive functions (Alexander & Schwanenflugel, 1996). Declarative knowledge often contrasts with procedural knowledge, that is, knowing how to do something, e.g. riding a bike or playing a musical instrument. This type of knowledge involves learned skills rather than explicit facts.
- ***Procedural knowledge*****:** It refers to an individual's understanding of applying methods and approaches to improve performance and complete cognitive tasks (Schraw, 2001). Therefore, it's an individual's understanding of cognitive processes and how they affect performance (Kuhn, 2000). Brown and DeLoache (1977) have noted that it's the ability to control one's learning and problem-solving processes through procedural knowledge. According to Kuhn (2000), procedural knowledge is a key factor in cognitive growth. It develops through practice and experience rather than simply

learning facts. Procedural knowledge is also closely related to skills and memory, and people may find it difficult to describe each step involved in a procedural task fully.

- ***Conditional knowledge:*** Conditional knowledge helps people adapt suitable strategies in different situations while considering the needs of learning activities (Schraw, 1998). Veenman (2016) has applied specific metacognitive techniques to problem-solving. According to Kuhn (2000), conditional knowledge is the ability to employ declarative and procedural knowledge situationally (Garner, 1990). This knowledge is crucial for problem-solving and decision-making, enabling flexibility and adaptability. It connects theoretical knowledge to practical application, helping individuals recognize their actions' relevance and timing.

Metacognition on teachers' professional development

Metacognition is a crucial component of teaching Higher-Order Thinking (HOT) and Professional Development (PD) (Zohar & Ben-Ari, 2022). Consequently, teachers' awareness of their PD may enhance their knowledge, comprehension, dedication, and abilities to teach metacognition. Thus, teachers must possess the metacognitive skills necessary to organize, observe, assess, and control the thought processes and teaching skills within the HOT domain (Zohar & Ben-Ari, 2022). Jiang et al. (2016) have noted that metacognition is a key element of teachers' professional growth. Teacher metacognition facilitates both professional development and student learning (Jiang et al., 2016). According to Manning and Payne (1996), a transformation in teachers' PD should commence with understanding what they already know about their teaching practices. The concept of metacognition suggests that teachers can become more reflective by critically analyzing their work (Duffy et al., 2009). This perspective indicates that critical thinking and debate skills are essential for preparing future democratic participants for active engagement in democratic processes (Zohar & Ben-Ari, 2022). Therefore, understanding the three variables of person, task, and strategy is vital for metacognitive knowledge and professionalism of teachers (Veenman & Elshout, 1999). According to Cochran-Smith and Lytle (1993), teachers utilize their expertise to establish viewpoints, make defensible choices, overcome challenges, analyze and design curricula, make strategic decisions, and, most importantly, define their teaching responsibilities. Moreover, teachers appear to employ more than just declarative and procedural knowledge when engaging in metacognitive activities or PD programs (Duffy et al., 2009). Schön (1983) revealed that metacognitive teachers report greater satisfaction with PD programs. Consequently, professional development enhances teachers' metacognitive knowledge, skills, and practices related to student achievement and teachers' self-awareness.

Metacognition on teaching experience

Teachers need to be knowledgeable about both their subject matter and their students, as well as employ effective teaching techniques (Hammerness et al., 2005). Thus, it is crucial to closely observe how teachers adapt after establishing a link between their metacognitive behavior and student progress (Duffy et al., 2009). Furthermore, teachers who evaluate their teaching report significantly improved student outcomes (Zimmerman, 2002). Jiang et al. (2016) found that teachers' metacognitive experiences encompass both affective and cognitive emotions throughout the teaching process. As teachers gain more experience, they will better understand the concepts of evolving modes of learning and metacognition (Wall & Hall, 2016). It is acknowledged that experience enhances skills and knowledge over time (Rice, 2010). However, even with increased years of teaching experience, metacognitive knowledge tends to remain constant (Stewart et al., 2007). Thus, there is no discernible effect of teaching experience on teachers' utilization of metacognition, and there may be theoretical

and empirical evidence supporting the notion that metacognition is a complex phenomenon (Efklides, 2008).

The present study

According to Fono and Zohar (2024), selecting a metacognitive conversation typically necessitates at least some application of knowledge. Consequently, there exists a gap in the understanding of teachers' metacognitive thought processes as they engage in professional development and discussions (Prytula, 2012). Teachers must be metacognitive and aware of their levels and traits of metacognition if they intend to educate students to think metacognitively (Jiang et al., 2016). According to Koriat (2007), metacognition is closely related to knowledge of mental states and consciousness, and it is being examined from a variety of perspectives and fields. However, this teacher research fosters a deliberate approach, which entails conscious awareness and control over one's learning (Wilson & Bai, 2010). Leutwyler (2009) stated that promoting teachers' metacognitive thinking requires more than traditional curricula and teaching methods. Furthermore, teachers with metacognitive attitudes are satisfied with their work and can regulate their emotions when interacting with students (Moè et al., 2010; Santisi et al., 2014). Schwartz et al. (2005) highlighted that teachers need metacognitive strategies that encourage adaptation rather than increased productivity on repetitive cognitive tasks. It is believed that teachers lacking metacognitive awareness are unable to assist students in developing their metacognitive awareness. The focus of metacognitive research has shifted from students to teachers (Kramarski & Michalsky, 2009; Veenman, 2016). Therefore, teachers must possess pedagogical knowledge about metacognition to effectively teach it to pupils (Rathore & Sonawat, 2015). A teacher can demonstrate to pupils what the strategies are, how to implement them, and under what conditions to implement them after thoroughly understanding the various metacognitive skills and methods (Wilson & Bai, 2010). Thus, in this study, it is essential to investigate how teachers perceive the process of teaching metacognition, their challenges, and the connections between their metacognitive expertise and pedagogical understanding of metacognition (Wilson & Bai, 2010).

Despite robust theoretical findings, many teachers lack sufficient expertise in metacognition (Veenman et al., 2006). A broad consensus holds that inquiry is crucial to teachers' learning throughout their careers (Dickson, 2011). Although its distinctive teaching characteristics differentiate it from many tasks and settings, the metacognitive approach has received support (Lin et al., 2005). For many years, the topic of how teachers learn and develop as professionals has engaged educators and scholars (Hammerness et al., 2005). Few studies have explored teachers' explicit awareness of their metacognition and their ability to reflect on, discuss, and articulate their thinking (Zohar, 1999). Since metacognition aids in effective problem-solving, educators may leverage it to address their educational challenges (Hiver & Whitehead, 2018). The process of metacognition in ongoing teacher education allows teachers to reconsider their pedagogical approach and perspective as researchers of this approach by reflecting on how they learn and, consequently, how they teach (Portilho & Medina, 2016). In the present study, examining teachers as metacognitive professionals is significant because it illuminates how teachers can utilize their metacognitive awareness and regulation of their thinking processes to enhance teaching effectiveness and improve student learning outcomes.

Research Questions

i. What are the key benefits of metacognitive awareness for teachers?
ii. What challenges do teachers face in being recognized as metacognitive professionals?
iii. What strategies can teachers employ to develop their metacognitive skills?

MATERIALS AND METHODS

The study relied on secondary knowledge to provide a diverse and comprehensive set of knowledge for answering the research questions and drawing conclusions. As highlighted by Munn et al. (2018), a literature review as secondary knowledge is a highly effective method for assessing the breadth and depth of existing research work on a specific topic, enabling a thorough exploration of both theoretical and practical dimensions. However, the field of teachers' metacognition remains relatively underexplored, with limited theoretical knowledge available. This scarcity stems from a lack of theoretical frameworks and the minimal integration of metacognitive concepts within teacher education programs. Existing research, such as that by Alam et al. (2024), Duffy et al. (2009), and Hiver and Whitehead (2018), points to significant gaps in understanding and application of metacognition in teacher education. These limitations hinder the development of strategies and tools that could support teachers in enhancing their metacognitive skills. To bridge this gap, further research is required to provide significant knowledge and perspectives that enhance teachers' metacognitive awareness and its integration into educational systems.

Key benefits of metacognitive awareness for teachers

Alger (2009) highlighted the importance of teachers' metacognitive expertise for effective teacher performance and student learning. Teachers' metacognition greatly influences the teaching and student learning processes (Prytula, 2012). Thus, teachers' metacognition greatly benefits students' learning outcomes and enhances teachers' 21st-century skills. The phrase 'thinking skills' is frequently used in the higher-order thinking literature to describe elements unrelated to the intricate conceptual frameworks of academic courses (Zohar, 1999). Higher-order thinking skills are one obvious illustration of the complicated abilities that school graduates need to possess to become competent adults in the twenty-first century (Zohar & Ben-Ari, 2022). To achieve this, teachers must possess essential skills that enable them to educate students effectively and prepare them for both personal and professional success. Figure 2 illustrates the key benefits of metacognitive awareness for teachers:

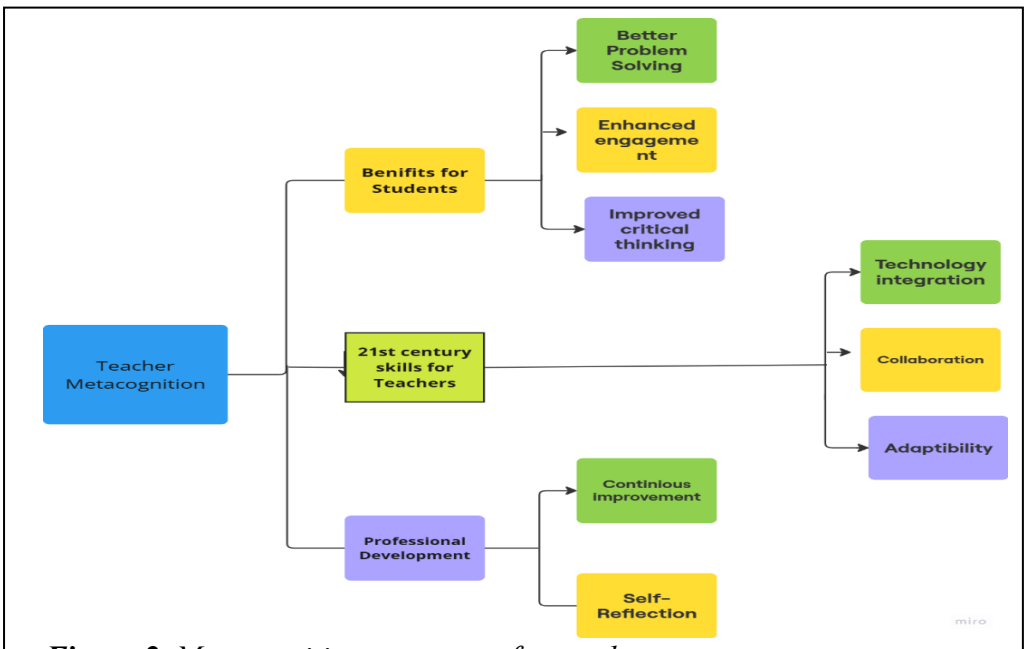

Figure 2. *Metacognitive awareness for teachers*

- ***Enhanced teaching effectiveness***: Stewart et al. (2007) revealed that age and teaching experience have a strong positive impact on their metacognition. Therefore, teachers who are metacognitively aware can better understand their thinking processes, which allows them to adapt their teaching strategies to meet the needs of their students more effectively. In addition, Schraw and Moshman (1995) report that reflective teachers are more likely to improve student outcomes.
- ***Improved student learning outcomes***: According to Wilson and Bai (2010), teaching students to be metacognitive necessitates a sophisticated grasp of both metacognition and metacognitive thinking techniques. Only metacognitive teachers are better equipped to model and teach metacognitive skills to their students, leading to enhanced critical thinking, inquiry-based learning, and problem-solving abilities among learners. Schön (1983) has noted that teachers engaging in structured reflection demonstrate more critical-thinking ability in educational decision-making. Therefore, students' capacity for critical thinking, investigation, and problem-solving can be substantially improved by developing their metacognitive knowledge (Graesser et al., 2005).
- ***Reflective practice***: To begin the process of reflection and adaptation, an adaptive metacognitive educator would be looking for anything novel (Lin et al., 2005). Metacognitive awareness encourages teachers to engage in reflective practice, allowing them to evaluate their teaching methods and make informed adjustments to improve their instructional approaches. In addition, Brookhart (2010) shows that metacognitive teachers use formative assessments to refine reflective instruction.
- ***Increased adaptability***: According to Depaepe et al. (2009), metacognitive exercises are rare in classrooms, despite their advantages. Teachers with strong metacognitive skills can adapt their teaching to different classroom situations and student needs, thus fostering a more dynamic learning environment. Furthermore, adaptable teachers report an improvement in addressing individual learning needs (Duffy et al., 2009).
- ***Professional growth***: According to Hiver and Whitehead (2018), teachers engaged in reflective practices are more likely to participate in professional training. By understanding students' cognitive processes, teachers can identify areas for personal and professional development, leading to continuous improvement throughout their careers.
- ***Facilitation of inquiry-based learning***: Learning through the inquiry process, conversations with students, and metacognition were all as important, if not more so, in forming the classroom learning environment (Wall & Hall, 2016). Metacognitive awareness supports inquiry-based learning because teachers can guide students in developing their metacognitive strategies, thus promoting a deeper understanding of the subject matter.
- ***Collaboration and communication***: Metacognitive teachers are often better at discussing and sharing their thought processes with colleagues, which can lead to collaborative learning and professional development opportunities. Moreover, schools with metacognitive programs show significant growth in collaboration and professional relationships (Hattie, 2008).
- ***Better assessment practices***: Black and Wiliam (2010) stated that teachers with strong metacognitive awareness use assessment results to improve learning outcomes more effectively. Therefore, metacognitive teachers are more adept at assessing students' understanding and learning outcomes. They can design assessments that evaluate content knowledge and gauge students' metacognitive skills, leading to more comprehensive evaluations of student performance.

- ***Promotion of lifelong learning***: According to Hammerness et al. (2005), the basis for lifelong learning should be established in teacher education to effectively prepare excellent teachers. Teachers who practice metacognition are more likely to instill a love for learning in their students. By demonstrating how to think, they encourage students to become curious and self-directed lifelong learners. In addition, teachers who engage in metacognitive practices enroll in higher education or certification programs (Mezirow, 1991).
- ***Reduction of cognitive load***: Cognitive overload impacts teachers, reducing their ability to think critically about their teaching (Sweller, 1988). By becoming aware of their cognitive processes, teachers can streamline their teaching methods, reducing unnecessary cognitive load for themselves and their students. This can lead to more efficient teaching and learning experiences.
- ***Enhanced problem-solving skills***: The state in which one thinks and solves problems is known as metacognition (Cohen, 1976). Metacognitive awareness equips teachers with better problem-solving skills, enabling them to navigate classroom challenges more effectively. They can analyze situations, consider various solutions, and implement strategies that are most likely to succeed. However, Wilson and Bai (2010) noted that students taught by teachers with metacognitive awareness develop strong problem-solving skills.

Overall, metacognitive awareness empowers teachers to enhance their instructional practices and contribute positively to their students' educational experiences. Schraw and Moshman (1995) report that teachers with strong metacognitive knowledge employ more varied instructional strategies, leading to improved student outcomes. These benefits highlight the profound impact that metacognitive awareness can have on teachers' professional development, the overall learning environment and student success.

Challenges faced by teachers as metacognitive professionals

Teachers lack the essential knowledge and awareness of metacognition and have encountered many challenges in their quest to improve professional practices and metacognitive skills. Braund and Soleas (2019) revealed that pre-service and in-service teachers had trouble maintaining metacognition in their practice. Teachers' professional development is crucial for their academic and professional advancement, and they are unfamiliar with the significance of this approach. They have been facing challenges in their continuous professional development. Therefore, existing professional experiences need to be enriched with metacognitive knowledge to elicit the existing challenges. However, being metacognitive professionals, teachers have been facing several challenges, such as:

- ***Lack of awareness and understanding***: Teachers are not associated with self-awareness and understanding of the phenomenon in the line of metacognition, systematically (Braund & Soleas, 2019). Even many educators do not have clarity on metacognition or its importance in teaching and learning. This lack of awareness can hinder the ability of metacognitive professionals to identify themselves.
- ***Insufficient training and professional development***: Professional development programs often overlook metacognitive strategies and fail to teach teachers how to implement metacognitive practices in their classrooms. Wilson and Bai (2010) highlight that teacher training programs explicitly cover metacognitive strategies. Khonamri et al. (2024) noted that starting changes in teachers' professional development are based on understanding their awareness of their teaching practices. This gap can prevent them from being recognized as experts in this field.

- ***Resistance to change***: Fullan (2007) revealed that resistance to change affects teachers, particularly those with limited exposure to innovative teaching practices. Hence, some educators may resist adopting innovative teaching methods or reflecting on their practices. This resistance can stem from the comfort of traditional teaching approaches or fear of the unknown. Resistance to change makes it difficult for teachers to apply metacognitive practices.
- ***Time constraints***: Teachers often face significant time pressure due to curriculum demands, administrative tasks and other responsibilities. Veenman et al. (2006) stated that developing new metacognitive information requires time and effort. This can limit their opportunities to engage in reflective practices and develop metacognitive skills. Furthermore, over 50% of teachers report insufficient time for reflective practices due to administrative tasks and lesson preparation (OECD, 2019).
- ***Lack of institutional support***: Teachers may struggle to implement metacognitive strategies effectively without support from institutional leadership that values metacognition. Institutional barriers can include a lack of resources, inadequate policies, or insufficient recognition of the importance of metacognitive practices.
- ***Assessment and accountability pressures***: Focusing on standardized testing and accountability measures can lead teachers to prioritize content delivery over metacognitive instruction. This pressure can diminish individuals' motivation to engage in metacognitive practices and advocate for their recognition as metacognitive professionals.
- ***Limited opportunities for collaboration***: Teachers may not have sufficient time and opportunities to collaborate with colleagues on metacognitive practices. Hence, institutions with limited professional learning communities show lower teacher engagement in reflective practices (DuFour et al., 2010). A lack of professional learning communities related to metacognition can hinder the sharing of strategies and experiences that enhance recognition.
- ***Variability in experience and expertise***: Teachers' metacognitive growth is also influenced by their prior teaching experience (Eldar & Miedijensky, 2015). Educators often have different levels of experience and expertise regarding metacognition. This variability can create disparities in perceiving and implementing metacognitive practices for some teachers who want to be recognized as metacognitive professionals.
- ***Cultural and contextual factors***: Different educational contexts and cultures may vary in possessing metacognition. Teachers in environments that do not prioritize reflective practices may struggle to gain recognition as metacognitive professionals. Therefore, teaching metacognition is situational because various environmental factors influence it (Duffy et al., 2009). As a consequence, teachers in such systems are less likely to adopt metacognitive practices (Hiver & Whitehead, 2018).
- ***Misalignment with educational policies***: Educational policies that do not explicitly support or recognize metacognitive practices. As a result, it creates barriers for teachers to be recognized as metacognitive professionals. Hence, this space has a discrepancy between practice and policy (Resnick, 2010). Without an alignment between policy and practice, educators can find advocating for their role as metacognitive professionals challenging.

These challenges highlight the need for systemic educational changes to support teachers' development and recognition of their metacognitive expertise. Teachers have been facing complexity in recognizing themselves as metacognitive professionals. Addressing these

issues requires a concerted effort from institutions, policymakers, and professional development providers to create an environment that values and supports metacognitive practices.

Strategies employed by teachers to develop metacognitive skills

According to Hartman (2001) and Ozturk (2017), teachers must be metacognitive and know how to apply their metacognitive strategies in the classroom to cultivate metacognitive learners. For this purpose, teachers must possess the required metacognition to demonstrate the necessary skills in their classroom. Teachers can employ several strategies to develop metacognitive skills, enhancing their ability to reflect on and regulate their thinking processes. For instance, participation in metacognition-focused training increases teacher awareness (Wilson & Bai, 2010), while metacognitive lesson planning improves teacher adaptability (Hattie, 2008). Hence, creative strategies and educational exercises are needed to stimulate and raise teachers' metacognitive ability. Moreover, the growth of metacognitive skills depends on essential strategies (Zhang & Zhang, 2019; Wilson & Bai, 2010). Veenman et al. (2006) revealed that teachers who adopt necessary metacognitive strategies show an improvement in their professional and personal endeavors. Therefore, essential strategies are keys to developing their metacognitive skills.

Table 1. Strategies employed by teachers to develop metacognitive skills

Strategy	Description	Impact
Self-Reflection	Regularly analyze and review teaching practices.	Identifies areas for improvement and promotes growth.
Goal Setting	Set clear, specific and achievable teaching goals.	Increases focus, motivation and accountability.
Use of Reflective Journals	Maintain a journal to document daily teaching experiences.	Enhances critical thinking and encourages continuous learning.
Feedback Seeking	Actively seek feedback from students, peers and supervisors.	Provides external perspectives for improvement.
Lesson Reviews	Analyze and review the success of lessons taught.	Identifies effective and ineffective strategies.
Use of Metacognitive Prompts	Use reflective questions like, What kind of decision works well?	Encourages deeper thinking about teaching decisions.
Mindfulness Practices	Engage in mindfulness to increase awareness of thoughts.	Reduces cognitive overload and enhances mental clarity.
Collaborative Reflection	Work with peers to reflect on teaching experiences.	Encourages shared learning and accountability.
Professional Development	Attend workshops, seminars and training on metacognition.	Builds knowledge of best practices and new strategies.
Action Research	Conduct small-scale research on teaching methods.	Empower teachers to base their reflections on evidence.

Therefore, teachers' metacognitive understanding of these strategies is essential for developing their skills (Soodla et al., 2017). By implementing these strategies, teachers can further enhance their metacognitive skills, leading to improved self-awareness, reflective practice, and ultimately more effective teaching and learning experiences for their students.

DISCUSSION

This study aimed to examine teachers as metacognitive professionals, focusing on the benefits of metacognition, the challenges teachers encounter, and essential strategies for enhancing metacognitive skills. Kluwe (1982) highlighted the importance of metacognitive research to expand our understanding of individuals as self-regulating, thinking beings who can assess themselves and others, directing their behavior towards predetermined objectives. Flavell (1976) reported that one aspect of metacognition is being conscious of oneself as an 'actor in one's environment', which entails possessing a stronger sense of self as an active, deliberate information processor and retriever. Duffy et al. (2009) stated that because academics and educators use different terminologies to represent the intentional and deliberative mental processes expected of teachers, it can be challenging to characterize them as metacognitive professionals. According to Hacker et al. (1998), it is crucial to consider that metacognitive thoughts do not originate from an individual's immediate external environment, which helps to distinguish them from other forms of thinking. Rather, their origin is associated with the individual's internal mental images of that reality, including their knowledge of these images. Additionally, teachers themselves expressed a shared goal of continually improving professionally to enhance their capacity and awareness to incorporate metacognition into the curriculum (Ben-David & Orion, 2013). Baylor (2002) revealed that teachers with a high level of metacognitive awareness were better at integrating metacognition into their classrooms than those with a low level. Therefore, there is growing evidence that teachers' metacognitive awareness significantly enhances students' achievement (Smith, 2013; Wall & Hall, 2016). However, a correlation exists between the pedagogical degree of metacognitive instruction and the metacognitive knowledge of teachers (Artzt & Armour-Thomas, 1998). According to Wilson and Bai (2010), to demonstrate thinking techniques and make problem-solving evident and comprehensible, teachers should possess a pedagogical understanding of metacognition and explain how self-awareness is a prerequisite for metacognitive pedagogical knowledge. Stewart et al. (2007) suggested that fostering learning and performance at all ages is achievable through the development of metacognitive awareness and abilities. Consequently, teachers should focus on the three aspects of metacognitive knowledge and their connection to the application of metacognition, aiding both pre-service and in-service teachers in cultivating this intricate pedagogical understanding of metacognition (Wilson & Bai, 2010).

Calderhead (1989) noted that teacher metacognition within pre-service and in-service teacher education is essential to prioritize thinking over memorization or metacognition over skill mastery. Metacognitive interventions can significantly enhance teachers' teaching competency (Fathima et al., 2014). Ben-David and Orion (2013) indicated that following a professional development course, teachers expressed more favorable opinions about metacognitive instruction and a desire to discuss metacognition in the classroom and further their education in this field. Chen et al. (2023) report that teachers' awareness of procedural knowledge increased significantly after completing the professional development program. Bransford (2000) suggests that teachers' learning capacity, pedagogical efficacy, ability to transfer knowledge from one context to another, and adaptability in a complex educational setting correlate with their understanding of cognition. Kleickmann et al. (2013) concluded that learning outcomes and teachers' pedagogical knowledge are positively correlated. Ben-David and Orion (2013) found a gap between teachers' attitudes and knowledge of metacognitive education and their implementation of these concepts in teaching. Hence, teachers must understand the teaching and learning processes and how to apply and impart this metacognitive awareness. Wilson and Bai (2010) revealed that teachers with greater task awareness report increased confidence in designing lessons for diverse classrooms.

Moreover, teachers must be aware not only of their thinking processes and beliefs but also of their varied requirements, preferences, and contextual circumstances (Alam et al., 2024). Therefore, teachers must be prepared to manage dynamic classrooms through appropriate pedagogy or teaching strategies to address the needs and preferences of their students.

However, following various literature, this study identified some standardized tools for further studies on metacognitive awareness:

Table 2. Standardized tools on metacognitive awareness

Year	Tools	Constructor
2011	Metacognitive Awareness Inventory	Sindhu
2011	Metacognitive Awareness Inventory for Teachers	Balcikanli
2010	Metacognitive Questionnaire for Teachers	Moè, Pazzaglia and Friso
1994	Metacognitive Awareness Inventory	Schraw and Dennison

From the above discussion and analysis, this study reveals some key findings that convey the most important takeaways from the study, such as:

- Teachers with higher levels of metacognitive awareness are better equipped to design instructional strategies, assess student understanding, and implement reflective practices that improve teaching quality.
- Teachers' metacognitive skills influence students' learning achievements by fostering critical thinking, inquiry, problem-solving, and self-regulated learning among students.
- Engagement in metacognitive practices encourages teachers to reflect on their teaching methods, leading to ongoing professional development and increased adaptability in diverse classroom contexts.
- Despite recognizing their importance, many teachers face obstacles such as limited awareness, insufficient training, and systemic barriers to effectively integrating metacognition into their teaching practices.
- Developing metacognitive skills fosters teachers' capacity for lifelong learning, inquiry, and professional autonomy, ultimately benefiting the educational system as a whole.

CONCLUSION

The study underscores that metacognitive skills are not static; they develop over time through experience, reflection and targeted strategies. Teachers' capacity for self-regulation and adaptation improves as they become more metacognitively aware, positively influencing their professional growth and classroom dynamics. The conclusion advocates for a shift in teacher education paradigms to emphasize metacognitive skills as a core competency, ultimately cultivating more reflective, autonomous, and lifelong learners among educators. It is anticipated that such a focus will significantly contribute to building resilient educational systems capable of addressing contemporary and future teaching challenges.

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Acknowledgment

First and foremost, I extend my heartfelt thanks to my supervisor/guide, Prof. Siva Sankar, for their invaluable guidance, insightful feedback, and continuous encouragement throughout this research journey. Their expertise and support have been instrumental in shaping the direction of this study.

Conflict of Interest

The author declared no conflict of interest.

How to cite this article: Ghosh, S. & Sankar, C.S. (2025). Teacher as Metacognitive Professional: A Perspective. *International Journal of Indian Psychology*, *13*(2)*,* 3290-3306. DIP:18.01.289.20251302, DOI:10.25215/1302.289