EXPLORING METACOGNITIVE AWARENESS AMONG ELEMENTARY SCHOOL STUDENTS: A DESCRIPTIVE STUDY

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Abstract

Metacognition is the process of thinking about thinking, or thinking at a higher level. Understanding the right methods and skills that are accomplished to achieve a certain educational goal is mainly considered the state of mental consciousness activities. Metacognition has mainly two aspects such as monitoring or controlling that play essential roles in transforming traditional learning intometa-cognitive-based learning environments. These aspects support students in being conscious of the learning process. The awareness of one's cognition or knowledge is an essential component of metacognition (Steven, 2009). Early students have developed cognitive abilities that enable them to process a wide variety of knowledge to meet their educational goals. In early school age, students have strong and capable cognition to process various types of information to achieve educational goals. The main objective of this study was to know the metacognitive awareness among elementary school students. In this study, the researcher used a standardized tool of meta-cognitive awareness (Dhyani, 2019) and the sample of the study was 86 (age group 12 to 14) elementary school students studying seventh class. The researcher used a simple random sampling technique for the collection of the data. The researcher used descriptive statistics and t-test statistical techniques. The findings of the study revealed that there is no significant meta-cognitive awareness among elementary school students of gender basisand locale. Additionally, it also showed thatteachers should adopt meta-cognitive activities in classroom learning that impact thestudent's cognitive process and help them to improve their educational performance.

Keywords: *Meta-cognitive, Awareness, Students.*

Introduction:

Individuals have the unique and essential ability to acquire knowledge from the past and transfer that knowledge to the following generation, and so on. In the 21st century, formal education serves as a vital mechanism for facilitating this organized transfer of knowledge within society. However, determining the most effective methods and strategies for this transmission has been a subject of intense debate among intellectuals and educationists over the past decade. These discussions aim to refine teaching methodologies and adapt educational practices to meet the evolving needs of learners in a dynamic world. One of the fundamental goals of modern education is to equip students with critical thinking skills and lifelong learning strategies. A quality education aims to foster self-motivation, enhance knowledge retention, develop emotional self-regulation, and promote holistic personal growth. To achieve these objectives, it is essential to evaluate both the cognitive and emotional abilities of students.

The concept of metacognition, introduced by Flavell in 1976, plays a significant role in this context. Simply put, metacognition is "thinking about thinking," which enables students to reflect on, control, and enhance their learning processes. By cultivating metacognitive skills, students gain the ability to take ownership of their learning, empowering them to become more independent, strategic, and effective learners. In other words, Flavell (1979) introduced the concept of metacognition as "knowledge and cognition about cognitive phenomena." This foundational definition highlights the dual aspects of metacognitive awareness: knowledge of cognition (awareness of oneself as a thinker) and regulation of cognition (managing one's cognitive processes).

Education plays a crucial role in fostering lifelong learning and driving social, cultural, economic, and personal growth. It serves as a powerful tool for societal transformation, contributing directly to national development by equipping individuals with the skills needed for critical thinking, problem-solving, and innovation. Schraw and Dennison's (1994) model of metacognition emphasizes the importance of metacognitive awareness for self-regulation, consisting of two primary components: knowledge of cognition (what one knows about their cognitive processes) and regulation of cognition (how one manages and controls these processes).Through formal education, students develop essential cognitive abilities such as strategic planning, setting objectives, organizing concepts, and processing information effectively. Additionally, education supports higher-order cognitive tasks like analysis, evaluation, and monitoring, enabling individuals to tackle complex and challenging work. By preparing learners to approach difficulties strategically and think critically, education becomes a cornerstone for personal empowerment and collective progress. Livingston (1997) defined metacognition as the awareness and regulation of one's own thinking, further linking metacognitive awareness to improved learning outcomes and academic performance.

Metacognition consists of two main components: metacognitive knowledge and metacognitive experiences or regulation (Flavell, 1979). Metacognitive knowledge refers to the understanding of cognitive processes and the ways in which they can be managed to improve thinking and learning. It includes knowledge about:

1. Individual Variables: Awareness of one's strengths and weaknesses in learning or cognition.
2. Task Variables: Understanding the nature and demands of a particular task.
3. Strategy Variables: Knowing effective strategies to use for problem-solving and task management.

In essence, metacognitive knowledge involves an awareness of both one's own and others' thought processes, enabling better regulation and reflection.

Procedural knowledge emphasizes the "how-to" aspect of performing specific tasks. Within the framework of metacognition, procedural knowledge extends to an individual's ability to connect various tasks, critically reflect on the procedures they use, and apply effective strategies for monitoring and self-regulation. Paris and Winograd (1990)highlighted that metacognitive awareness is critical for fostering independent learning and improving problem-solving skills, especially in younger students. By integrating these elements, metacognition empowers individuals to manage and

refine their cognitive activities, leading to enhanced learning efficiency and more effective problem-solving abilities.

The Fifth Survey of Educational Research (1997) highlightsthe report school/classroom climate, teaching-learning process, learning style and techniques or cognitive growth, and the personality pattern of the individual mainly inter-association factor of meta-cognitive awareness of the students.Brown and Palincsar (1987), Bruning, Schraw, Norby, and Ronning (2004), and Gunstone (2013) present a more comprehensive review that divides metacognition into two categories: regulation of cognition and knowledge of cognition. The theoretical comprehension of cognition, also known as meta-strategic knowledge, is referred to as knowledge of cognition or meta-cognition. The regulation of cognition refers to the ability to monitor, control, and adjust one's cognitive processes effectively. Developing metacognitive awareness is a vital step in helping students become not only more efficient learners but also self-sufficient. When students understand how they learn, they can identify and adopt the most effective methods to enhance their learning outcomes. This awareness empowers them to take charge of their educational journey, fostering independence and lifelong learning skills.

Researchers have highlighted various strategies that are instrumental in fostering metacognitive skills during the teaching-learning process. Angelo and Cross (1993) emphasize the availability of a diverse array of activities and assignments that educators can adapt and implement across various educational contexts. These strategies are particularly effective when students actively engage with one or more of them during the learning process. By incorporating such strategies, teachers can promote better self-regulation, critical thinking, and reflection, ultimately enhancing students' ability to manage and optimize their learning experiences.Assessing students' metacognitive skills is crucial for developing more effective and impactful educational strategies. Metacognition, often described as higher-order thinking, involves actively overseeing and managing cognitive processes during learning tasks. It plays a significant role in cognitive endeavors, yielding a wide range of meaningful and practical outcomes. By fostering metacognitive skills, students can enhance their learning efficiency, improve analytical thinking, strengthen problem-solving abilities, and ensure the persistence and practical application of acquired knowledge. In essence, metacognition empowers learners to engage more deeply with their learning process and achieve greater academic and personal success.

Related review

Young and Fry (2008) showed that the favorable effects of academic success and metacognitive awareness on students' accomplishments were also emphasized, as was the connection between academic achievement and metacognitive awareness. The findings indicated a relationship between metacognitive awareness and students' academic success(Narang andSaini 2013; Jayapraba 2013; Alshammari2015).

Shetty (2014) investigated the metacognition levels of student teachers according to their preferred methods of learning. The study's conclusions showed that in terms of metacognitive awareness, introverted student teachers scored noticeably higher than extroverted student teachers.

sensible and intuitive student teachers' metacognitive awareness did not differ significantly. The metacognitive awareness of thinker learners was significantly different from that of feeler student teachers (Hasbulla2015; Bursali(2018)

Chandrashekar B. (2016) examined the student teachers' metacognition skills in relation to their preferred learning modalities. According to the studies, introverted student teachers outperformed extroverted students in terms of metacognitive awareness. The metacognitive awareness of intuitive and insensitive student teachers did not differ substantially. Thinker student instructors' metacognitive awareness differed markedly from feeler students'. furthermore, Jaleel S. conducted research on student instructors' metacognition skills based on their preferred learning styles. According to the studies, introverted student teachers outperformed extroverted students in terms of metacognitive awareness. The metacognitive awareness of intuitive and insensitive student teachers did not differ substantially. Thinker student teachers showed a considerable difference in their metacognitive awareness compared to feeler learners (Premachandran 2016;Ari et al. 2020;Selva, Bakkaloglu2020).

Sudadi et al. (2023) studied that abstraction, pattern identification, and decomposition are the computational thinking skills of students who apply metacognitive awareness in problem-solving. Additionally, abstract reasoning and pattern recognition are demonstrated by pupils who possess strategic metacognitive awareness. Furthermore, children who solve problems using computational thinking demonstrate metacognition knowledge through abstraction or breakdown (Enie et al.2020; Birsen et al.2020;Shahidul et al. 2022; Fauziana et al.2022;Alla2022).

Mok and Neuenschwander(2024) examined the impact of students' metacognitive knowledge on teachers' academic judgments, school track recommendations, and students' transition to Gymnasium. Analyzing data from 5,870 elementary students in the German National Educational Panel Study, researchers used a multilevel path model to assess these relationships. Findings indicated that metacognitive knowledge indirectly influences school track recommendations and transitions to Gymnasium through teachers' achievement judgments.

Triwahyuningtyas et. al (2024) exploredsixth-grade students' metacognitive activities, roles, and abilities during group discussions on multiplication in an Indonesian public elementary school. Using a descriptive qualitative approach, the research found that metacognitive awareness was prominent in expert and facilitator roles, regulation appeared in expert and facilitator students, and evaluation was present across all roles. Expert students acted as initiators and regulators, facilitators contributed as regulators and passive participants, while novice students primarily took on a passive role.

Significance of the study

The concept of "metacognition" has been used to describe an understanding of cognition and cognition management in contemporary psychology literature. Efklides (2008) highlights in his study that Metacognitive knowledge, experiences, and skills are the three aspects of metacognition. Knowledge of cognition as well as management of cognition, the two parts of metacognition, are mainly considered by the majority of researchers as interrelated phenomena. According to

educational psychologists, the highest growth of the individual depends upon their metacognitive awarenesswhichplaysa significant role inhow to deal with daily life problems of solutions or also aware about how to deal or handle it and also used topreserve their self-worth often employ metacognition as a strategy.

Metacognition, when viewed through the lens of constructivist philosophy, plays a pivotal role in helping students build their own knowledge and enhance their learning. Constructivism emphasizes that learning is an active process where individuals construct new understanding based on their prior knowledge and experiences. In this context, metacognition can be seen as the tool that helps students actively engage in and take control of their cognitive processes, which are central to constructing meaningful and enduring knowledge. By incorporating metacognition into their learning processes, students learn not just to gather information, but to organize it, reflect on it, and apply it to new and complex situations.

Higher-order thinking, as a key element of metacognition, involves the active regulation and management of cognitive activities during learning. Students engage in metacognitive activities such as thinking through how to approach a learning task, monitoring their comprehension as they progress, and evaluating their understanding throughout the learning process. For example, students may ask themselves questions like: "Do I understand the concept?" "What strategy should I use to solve this problem?" and "What progress have I made so far?" These reflections not only allow them to stay on track but also help identify any gaps in their understanding, giving them the opportunity to adjust their approach or strategy before proceeding further. This ongoing self-regulation enables students to take greater responsibility for their learning, which is an essential aspect of becoming lifelong learners.

Additionally, metacognition serves as a compass, guiding the learner in the right direction and aiding in decision-making throughout the learning journey. It provides students with the skills to make informed decisions about how to approach tasks, which resources to use, and how to allocate their efforts effectively. This guidance helps ensure that students can learn more efficiently, recognizing when their strategies are not working and shifting to alternative approaches when needed. Teachers play a crucial role in teaching metacognitive strategies, providing students with structured guidance on how to think about learning tasks and self-regulate their thinking processes. This might include modeling the use of certain strategies, offering prompts for self-reflection, and encouraging the use of specific techniques such as summarizing key points, creating visual aids, or engaging in group discussions to clarify understanding.

Moreover, metacognitive strategies include both the physical actions a student takes and the thought processes behind those actions. For instance, actively taking notes, organizing ideas, or performing self-quizzing are physical strategies that are directly linked to metacognitive thinking. By combining these physical actions with reflective thinking, students develop a more comprehensive and integrated approach to their learning. The benefits of metacognition extend beyond academic achievement to other areas such as increased enthusiasm and interest in learning. When students are aware of the strategies that help them learn best, they are more likely to engage in the learning process and maintain motivation, as they feel more competent in their ability to solve problems and overcome challenges.

In particular, the primary advantages of metacognitive processes are twofold: first, they significantly enhance problem-solving abilities, as students learn to approach complex problems systematically, break them down into manageable components, and reflect on which strategies are most effective. Second, metacognition fosters deeper understanding by enabling students to explore new information and connect it to existing knowledge. This exploration process enhances the integration of new knowledge with prior understanding, leading to more durable and meaningful learning. Ultimately, teaching metacognitive strategies equips students with the skills necessary to adapt to new learning contexts, solve problems creatively, and engage in continuous growth and development.

Metacognitive strategies related to awareness are often used in problem-solving processes or when analyzing significant information related to a specific area of interest. Metacognitive techniques need to appropriately represent what is being learned to be remembered(Dunlosky, 1998; Garofalo, 1989; Schoenfeld, 1994; Artzt and Armour-Thomas, 1998).Teachers must be highly imaginative in this area and endeavor to ignite each student's thinking process according to their potential with the limited resources available to them, as our educational system lacks the required facilities in this regard. Students will actively use metacognitive strategies to solve problems throughout their lives following a review of the literature, the researcher considers that one of the primary factors responsible for their disruptive behaviors is a lack ofmetacognitive awareness among elementary school students.

Statement of the problem

Study of Meta-Cognitive Awareness among Elementary School Students.

Objectives

- To study gender differences in meta-cognitive awareness among elementary school students.
- To study meta-cognitive awareness among elementary school students across locale wise.

Hypotheses

- There exist no significant gender differences in meta-cognitive awareness among elementary school students.
- There exists no significant difference in meta-cognitive awareness among elementary school students across the locale.

Research Methodology

A well-structured research methodology is crucial for effectively addressing a research problem. It provides systematic approaches to investigate and analyze the issue. In this study, a descriptive research design was employed to examine metacognitive awareness among seventh-grade students.

To ensure a representative sample, the researcher utilized a stratified random sampling technique. The study included 86 students from the Punjab School Education Board, Mohali, within the age range of 12 to 14 years. This sampling method ensured diverse representation across different student groups.

Sample of the study

Table I

Gender	**Male**	42	86
	Female	44	
Locale	**Urban**	41	86
	Rural	45	

For data collection, a standardized metacognitive awareness scale was used. The scale, developed by Dhyani (2019), has a reliability coefficient of 0.78, making it a reliable tool for measuring students' metacognitive abilities. The collected data helped in understanding how students regulate their learning, reflect on their thought processes, and apply metacognitive strategies in academic settings.

By employing a structured approach, this study aimed to provide meaningful insights into students' metacognitive awareness. The findings contribute to educational research by highlighting the importance of fostering metacognitive skills in young learners, ultimately enhancing their ability to think critically and learn independently.

Statistical techniques used in this study

The descriptive statistical and t-test statistical techniques used by the researcher.

Analysis and interpretation of the data

In this reserch section,the researcher used descriptive and t-test statistical techniques for the analysis of the data.

Table- II

Metacognitive awareness	Mean	Median	Mode	SD	t-test	Significant
Male	53.21	50	51	21.52	0.866	No Significant
Female	54.89	52	51	19.52		

Table -I, showed that values of the mean, median, and mode are approximately equal to each other and the value of the mean score of females is higher than male elementary school students.

Hence, a hypothesis that there exist no significant gender differences in meta-cognitive awareness among elementary school students stands accepted.

Table- III

Metacognitive awareness	Mean	Median	Mode	SD	t-test	Significant
Urban	57.41	56	56	23.52	0.68	No Significant
Rural	51.97	49.85	49	21.22		

Table -III, showed that values of the mean, median, and mode are approximately equal to each other and the value of the mean score of urban is higher than rural areas of elementary school students.

Hence, a hypothesis that there exists no significant difference in meta-cognitive awareness among elementary school students across locale stands accepted.

Results

The findings of the study showed that there exists no significant gender difference among elementary school students and also presented that females have better metacognitive awareness comparedto male students. Research has revealed that there is no significant difference in metacognitive awareness among elementary school students across different locales, such as urban and rural areas. This finding suggests that, in general, students' ability to think about and regulate their cognitive processes is similar regardless of whether they attend school in urban or rural settings. However, when comparing the mean scores of students from these locales, studies indicate that students in urban areas tend to score higher in metacognitive awareness than those in rural areas. This difference could be attributed to various factors, including the availability of resources, teacher training, and access to educational support services, which are typically more abundant in urban schools.

Urban schools often benefit from more advanced teaching materials, technology integration, and specialized instruction that can support the development of metacognitive skills. In contrast, rural schools may face challenges such as larger class sizes, limited access to trained educators, and fewer learning resources, which can hinder the development of such skills. Additionally, urban students might have more exposure to activities and programs that foster critical thinking, self-reflection, and strategic learning, while rural students may have fewer opportunities for such experiences.

Despite these disparities, it is important to note that the lack of a significant difference in metacognitive awareness between urban and rural students overall suggests that metacognitive skills can be cultivated in diverse settings. With targeted interventions, teacher training, and efforts to equalize educational opportunities, rural schools could potentially close the gap in metacognitive awareness, enabling students from all locales to benefit from the advantages of these skills in their learning processes.

Conclusion of the study

Meta-cognitive awareness among elementary school students affects their academic progress and they perform well. Previous studies have established a strong connection between metacognitive awareness and various cognitive functions, such as understanding, regulation, and control over cognitive processes. Metacognition, often referred to as "thinking about thinking," plays a crucial role in how students manage their learning, monitor their progress, and adjust strategies accordingly. Research has demonstrated that students with well-developed metacognitive skills tend to achieve higher academic success, as they can more effectively understand and regulate their thought processes. This relationship between metacognition and academic achievement has led scholars to emphasize the inclusion of metacognitive skills within curricular frameworks to promote deeper learning and better academic outcomes.

In particular, metacognitive awareness has been identified as an essential factor for students' success, as it enhances their ability to approach tasks in a strategic manner. Students with strong

metacognitive skills are often better at understanding what strategies work best for them in different learning contexts and can apply these strategies more effectively. The ability to assess one's own thinking and adjust methods accordingly enables students to overcome learning obstacles, engage in more thoughtful problem-solving, and complete tasks with greater efficiency. Consequently, many education systems now prioritize teaching metacognitive skills to students, viewing these skills not only as vital for immediate academic performance but as key components of lifelong learning.

Moreover, the role of metacognitive awareness extends beyond cognitive regulation to include emotional and motivational aspects. Research has found significant associations between metacognition and other important factors such as intellectual ability, creativity, motivation for learning, and emotional self-regulation. Students who are metacognitive are better equipped to handle the challenges and frustrations of the learning process, as they can identify when they are struggling and take steps to address these challenges. This adaptability fosters intrinsic motivation and encourages a growth mindset, wherein students see challenges as opportunities for growth rather than obstacles to success.

However, not all students demonstrate the same level of metacognitive awareness or regulation, particularly at the elementary school level. While some students exhibit strong metacognitive skills and can effectively manage their learning, others may struggle to understand or apply certain metacognitive strategies. This inconsistency often results in disparities in how students approach tasks, regulate their thinking, and perform academically. For example, while some elementary school students can identify when they need help, adjust their study strategies, or monitor their understanding during lessons, others may not recognize when they are struggling or fail to implement effective strategies. As such, it is important for educators to provide targeted support to help these students develop better metacognitive skills, ensuring they become more self-sufficient learners.

Given the benefits of metacognition, teaching elementary school students to be metacognitive can significantly improve their learning experiences and academic outcomes. By integrating metacognitive awareness into the curriculum, educators help students become active participants in their own learning processes, promoting both academic success and a deeper, more reflective engagement with learning. This approach encourages students to recognize the value of their own thought processes and enables them to take ownership of their educational journey, equipping them with the tools necessary for lifelong learning and achievement. By fostering metacognitive skills early in students' educational careers, we set the foundation for continuous academic growth, self-improvement, and personal development.

Delimitation of the study

- This study delimits only 86elementary school students affiliated with PSEB.
- Only one variables were used by the researcher i.e. Metacognitive awareness.

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