Effect of Metacognitive Strategies on Students to Achieve Sustainable Learning Skills

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*Abstract-*This research examines how metacognitive methods affect students' sustainable learning abilities. Metacognition—the awareness and modulation of cognitive processes—is crucial to successful learning. The study uses qualitative methodology to determine the relationship between metacognitive tactics and academic achievement and qualitative analysis to understand students' perspectives. The results show that metacognitive methods improve learning outcomes. Metacognitive processes improve self-awareness, goal-setting, and adaptive learning, laying the groundwork for academic achievement. Quality statistics reveal how metacognitive methods improve critical thinking, problem-solving, and learning comprehension. This study advances educational psychology and helps instructors improve students' metacognition. Understanding how metacognition affects sustainable learning may help create successful pedagogical interventions and curricula, making students more resilient and adaptive in the ever-changing education context.

Keywords: Metacognition, Strategies, Skills.

I.   INTRODUCTION

Understanding and being aware of one's own cognitive processes is often known as metacognition. Many academics from many disciplines have offered sophisticated definitions of metacognition, and their insights help fill in the gaps in our knowledge. This is a collection of definitions from various academics:

According to John Flavell (1976):

"Knowledge of one's own cognitive processes and outcomes, or anything connected to them, is known as metacognition. This includes things like how hard one tries to complete cognitive tasks or whether or not one's performance is accurate" (Flavell, 1976).

According to Ann L. Brown (1978):

"Metacognition is the process by which individuals manage and steer their own learning"(Brown, 1978).

According to Donald Schön (1983):

"Being aware of and knowledgeable about one's own cognitive processes is an important part of having metacognitive knowledge" (Schon, 1983).

Promoting students' flexibility and success throughout their lives has made the search of sustainable learning skills vital in the ever-changing world of education. There has been a lot of focus on the importance of metacognitive methods in improving students' learning experiences as educational paradigms move towards a more complex and dynamic framework. Metacognition, which literally means "thinking about one's thinking," is the capacity to monitor and control one's own thought movements. Learning and skill development are greatly facilitated by this cognitive self-awareness. Exploring metacognitive methods is front and centre as schools aim to provide pupils with both subject knowledge and the skills to adapt to a constantly changing environment. Examining the effectiveness of metacognitive tactics in developing long-term learning abilities, this study probes their influence on pupils. In this setting, "sustainable learning" means laying the groundwork for lifelong learning and career success by establishing routines and skills that go beyond meeting short-term academic needs. Teachers, curriculum developers, and lawmakers who want the best possible educational results must have a firm grasp of the complex interplay between metacognition and the ability to learn over time. In order to add to what is already known, this research will look at which metacognitive methods have the most impact on helping students develop abilities for long-term learning. By studying what works, teachers may improve their lessons and help students develop a growth mindset that allows them to adjust to new situations.

Research Question:

- What is the effect of particular metacognitive methods on students' acquisition and retention of sustainable learning skills in different academic fields and at different educational levels?

Research Objective:

- To investigate the effect of particular metacognitive methods on students' acquisition and retention of sustainable learning skills in different academic fields and at different educational levels.

II. LITERATURE REVIEW

Perception, according to Piaget, may emerge as a process of progressively forming associations between certain sensory field features. He demonstrates that a child's perception of space and objects is still developing; at this stage, he has trouble differentiating between himself and the world around him, and he has trouble telling the difference between changes in the character of objects brought about by his own movements and those that have resulted from the actions of other objects. The object's static quality emerges as a result of the infant's spatial field organization, or the internal scheme of his immediate surroundings and the universe at large. This scheme allows the youngster to foresee the outcomes of his own actions. Perception is built upon preexisting sensor-motor frameworks that govern movement and object manipulation. Knowledge of the world is not found, but rather formed as a picture, according to J. Piaget. "The image is a subjective picture of the world or its fragments, the subjective representation of the objects of the external world, conditioned both by sensually perceived signs and hypothetical constructs" that occur in nature (Piaget, 1986).

The relationship between metacognition and academic performance metrics has been the subject of many studies. Metacognitive knowledge, metacognitive control, or both are used to test metacognitive abilities in these research. Nevertheless, the literature assesses these components in diverse ways. In order to quantify metacognitive abilities and how they relate to accomplishment metrics, some studies use self-report surveys (Schraw & Dennison, 1994; Sperling et al., 2004).

Time budgeting, goal setting, and the activation of prior knowledge are all components of planning, which also include the selection of suitable solutions and the allocation of resources. The process of regulating or monitoring is paying attention to and being cognisant of one's own understanding and performance on a task, which may include self-testing. The last definition of assessment is "appraising the products and regulatory processes of one's learning," which include going back to the drawing board and making adjustments to one's original objectives (Schraw et al., 2013). In the framework of "cognitive experiences," or realizations or impressions that arise during cognition, such as "I'm not understanding this," Flavell (1979) addresses cognitive monitoring. According to Flavell, these encounters act as "quality control" measures that assist students in reevaluating their objectives. Three clusters of mental activity—awareness, monitoring, and regulation—that

are intrinsic to metacognition in the context of reading comprehension are identified by Haller et al. (1988). This concept defines awareness as the ability to detect both explicit and implicit information and to respond appropriately when there is textual contradiction or inaccuracy. Setting objectives, reflecting on oneself, paraphrasing, bringing up pertinent prior information, drawing connections between newly learned and previously taught material, and summarising to improve reading comprehension are all part of monitoring. Lastly, "compensatory strategies to redirect and bolster faltering comprehension" are referred to as "regulating."

A correlation between cognitive monitoring and cognitive understanding has been found by researchers. As an example, Flavell (1979) states that the ability to monitor and control one's own cognition is a key component of metacognitive knowledge, which is essential for its growth and refinement. Consequently, Schraw (1998) references several empirical research that show how cognitive expertise helps with cognitive control. According to his research, there is a strong correlation between cognitive knowledge and cognitive regulation (r=.50), meaning that cognitive regulation accounts for around 25% of the variation in cognitive knowledge and 25% in cognitive knowledge is due to cognitive knowledge. Schraw and Moshman (1995) go even further, stating that metacognitive theories include both knowledge of cognition and management of cognition. In order to organise their information and arrange their cognitive operations, people develop three different kinds of theories. Without consciously thinking about it, people build tacit theories based on their own experiences and the experiences of their peers. The fact that these notions are implicit makes it more likely that they will be hard to alter. The term "fragmentary" describes informal theories, which means that people may be familiar with parts of these theories but don't have a clear framework for organising their knowledge views. One might anticipate a gradual formalisation and improvement of these informal ideas as time goes on. The last point is that formal theories are very organised and systematic. The rarity and clarity of these notions makes them ideal for "purposeful and rigors evaluation."

Managing and changing one's own "if, when, and how one experiences emotions and emotion-related motivation and physiological states and how emotions are expressed behaviorally" (p. 681) is what young children's emotion-related selfregulation is all about, according to Eisenberg (2010). Similar to the regulation of cognition involved in the executive functioning portion of metacognition, this emotion-related self-regulation entails keeping track of and controlling how one's motivational and emotional states affect one's performance. "The efficiency of executive attention—including the ability to inhibit a dominant response and/or activate a subdominant response, to plan, and to detect errors" (p. 682) is how Eisenberg describes effortful control (EC), a subskill. Eisenberg contends that intrinsic motivation is a medium via which EC is

associated with academic achievement. Eisenberg provides the following explanation of the relationship: In terms of social competence and the quality of their relationships with others, children with high EC tend to operate in more productive and pro-social ways. When kids like this are comfortable interacting with their peers, they are more likely to put their best effort into their schoolwork. Then, it is believed that more accomplishments would follow this heightened drive. Interventions aimed at enhancing students' EC may result in enhanced peer relationships, more engagement with schoolwork, and better learning results, according to Eisenberg's analysis of the available empirical evidence, which seems to corroborate this postulated connection. For instance, extracurricular activities (EC) in preschoolers were associated with motivation, interpersonal skills, and eventual SAT scores. According to Ray and Smith (2010), EC is a good indicator of how well a kindergartener will do in arithmetic and reading in the future.

III. METHODOLOGY

To fully explore and understand the complexities of the topic, our study used a qualitative methodology. The study set out to understand the phenomena on a deeper level by collecting diverse human experiences using a variety of qualitative research methods including content analysis, observations, and interviews. The researchers were able to comprehend the context of the study issue in its entirety, as well as delve into complex viewpoints and underlying meanings, thanks to this technique. In order to tackle the intricacies of the research issue, the study aimed to shed light on them by using qualitative methodologies. This would provide a more thorough and qualitative viewpoint to supplement quantitative data.

Sampling and sample size:

There were 56 students (26 girls and 30 boys) from different socioeconomic backgrounds that took part in this qualitative research. A varied and inclusive sample would include male and female students from a range of socioeconomic backgrounds. This diverse sample, which includes people of all sexes and socioeconomic backgrounds, is ideal for qualitative research since it allows for a more in-depth examination of the issue at hand. Considering the possibility of differences in experiences depending on academic levels, including participants from various courses may potentially lead to a more diverse variety of findings. The research results are strengthened by the broad participant pool, which increases the likelihood of acquiring detailed and nuanced qualitative data.

IV.   RESULTS

Q 1: Are you familiar with the term "metacognitive strategies"?

Upon being queried "Metacognitive strategies" is a word that you may be acquainted with. It was a word that few of the pupils had ever heard of. Very few pupils put up their hands to show that they were familiar with the term.

According to P (03):

I am well-versed in the concept of "metacognitive strategies." The capacity to reflect on and manage one's own thought processes is known as metacognition.

Another P (18):

Individuals use metacognitive tactics when they want to keep tabs on, manage, and improve their own learning and thinking processes. Planning, monitoring, and assessing cognitive activity are common components of these tactics, which include thinking about one's own thinking.

One more P (42):

People may acquire and practice metacognitive skills, which help them become more self-aware and in charge of their own thought processes.

Q 2: Do you consciously use metacognitive strategies in your learning process?

When asked if they intentionally use metacognitive methods when learning, students often say yes. Rarely or never did the majority of the kids respond. Even fewer students admitted to having trouble successfully putting these techniques into practice.

As P (09):

In order to stay focused and get things done during a study session, I make a list of all my objectives beforehand. Having a clear goal in mind for my education helps me keep focused and make sure I don't miss anything crucial.

According to P (11):

Depending on the topic, I switch up my study techniques, using flashcards to help me remember information and group work to help me comprehend concepts better.

Another P (33):

As a bonus to helping my classmates learn, I find that explaining things to them helps me understand them better myself.

As per P (49):

When one strategy for studying doesn't cut it, I'm willing to switch things up. Because I am adaptable, I can change my approach depending on how difficult the content is.

Q 3: In your opinion, what are the essential skills for sustainable learning?

In response to a question from a student: "In your view, what are the crucial abilities for long-term learning?" Different people have different experiences and viewpoints, thus they provide different replies.

As per P (02):

The key to staying focused on what I need to do is setting clear objectives. It gives you something to aim towards and accomplish. Unless I have specific objectives, I risk being disoriented and confused about my future.

According to P (38):

Making sure I'm on the correct road requires frequent checks of my comprehension. I am able to remain motivated and make the required modifications because of this. It is essential for me to stay on track and realise my best potential.

Q 4: Do you believe that metacognitive strategies contribute to the development of sustainable learning skills?

When asked if they think metacognitive methods help students build abilities for long-term learning, students said yes. Some of them agree and others disagree when asked for their ideas. The effect of metacognitive methods on long-term memory and other forms of sustainable learning may, in the end, be context and experience dependent.

According to P (05):

In a heartbeat! Staying organised and efficient is much easier when I am conscious of my learning process. When I study, metacognition is like a support system. This helps me stay focused. It sheds light on my learning skills and areas for improvement, so I may adjust and perfect my study techniques.

As P (11):

Ever since I began using metacognitive methods, my grades have been steadily rising. Studying has taken on a whole new dimension when I started reflecting on what I've learned.

Moreover P (21):

Through the practice of metacognition, I am able to modify my approach to studying in order to maximise my performance in various classes. I stay motivated and on track when I set objectives and track my progress. Over time, I can see how much I've improved.

Q 5: What challenges, if any, have you faced in implementing metacognitive strategies in your learning process?

If you've tried using metacognitive tactics to improve your learning, what obstacles have you encountered? People who took part in the research said they had trouble incorporating the tactics into their regular study habits. When they were on their own to study, many of them forgot to employ the tactics.

As per P (24):

At first, I found it difficult to comprehend and use metacognitive tactics due to my lack of experience with them. But I know that my metacognitive abilities may be enhanced with training and instruction.

Another P (31):

I, as a student, find it difficult to accept new methods of study, particularly when others seem to be doing well with the ones they now use. It may be challenging to persuade me to use metacognitive tactics.

Moreover P (52):

The significance of metacognition to the educational process is unknown to me. I fail to see a clear correlation between the way I think and my performance in the classroom. Changing the way I study does not seem like it will improve my grades.

V.   CONCLUSION

Finally, the investigation of metacognitive methods exposes a diverse terrain of student awareness and implementation. Many people either don't know what metacognitive methods are or have trouble incorporating them into their learning processes, however other people seem to have a good grasp on the idea and actively use them.

The stories of individuals who are knowledgeable about metacognition show how it may change people's lives. Improved concentration, productivity, and overall academic achievement are clearly attainable outcomes of deliberate goal-setting, method-adaptation, and reflective practice. For these people, metacognitive methods are a lifeline; they help them see where they can grow and provide them a plan for doing so.

Nevertheless, metacognitive methods continue to be difficult to execute. Some pupils claim they don't understand these strategies because they are unfamiliar with them or are resistant to change. For others, the apparent disconnection between thought processes and academic achievement is a barrier that reduces their incentive to use metacognitive strategies.

Metacognitive methods seem to be context sensitive in terms of their efficacy in promoting sustainable learning skills in the larger context. While some claim to have seen an uptick in their scores and general performance, others continue to doubt that changing the way they study really improves their results.

The process of adopting metacognitive techniques is complex, characterised by different degrees of self-awareness, acceptance, and implementation. To fully realise the promise of metacognition in education, it is crucial to bridge the gap between academic understanding and practical execution while also addressing individual problems.

VI. RECOMMENDATIONS

- Promote students' understanding of metacognitive methods via the launch of educational initiatives. This idea and its possible advantages may be introduced to students via workshops, seminars, or integrated curricular components.

- The formal education curriculum should include metacognitive training. Encouraging students to reflect on their learning processes and employ metacognitive skills may be achieved via specific classes, assignments, or projects.

- Provide teachers and students with tools and training to help them use metacognitive skills in the classroom. Help with things like goal-setting, planning, tracking, and self-evaluation might be part of this.

- Initiate peer mentorship programmes so that students who are already good at metacognition may help those who are struggling. One strategy to help students make the transition from classroom theory to real-world practice is to provide them with peer assistance.

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