Scholarly Research Journal for Interdisciplinary Studies,
Online ISSN 2278-8808, SJIF 2021 = 7.380, www.srjis.com
PEER REVIEWED & REFEREED JOURNAL, NOV-DEC, 2022, VOL- 10/74

DEVELOPMENT AND STRATEGIES OF META-COGNITIVE SKILLS FOR STUDENTS

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Paper Received On: 25 November 2022
Peer Reviewed On: 10 December 2022
Published On: 01 January 2023

Abstract

The effective organization of teaching learning-process will bring a permanent change in the behavior of the individual. In the school, there are different subjects imparted in to the students, the process of learning to the students. All these subjects make use of different kinds of learning strategies, which makes it easy to understand and apply that knowledge wherever necessary. Metacognitive skills development provides an opportunity to develop self-efficacy and autonomy. Most accounts of metacognition make a basic distinction between metacognitive knowledge (i.e., what one knows about cognition) and metacognitive control processes (i.e., how one uses that knowledge to regulate cognition). The tasks a learner can do to guide the learning and problem-solving process are referred to as cognitive regulation. Monitoring and control are two mechanisms that are frequently used to regulate cognition (Pintrich, et al., 2000; Son &Schwartz, 2002).A further operationalization of monitoring and control leads to the identification of metacognitive skills. Metacognitive experience takes the form of metacognitive feelings as they are non-analytic representation of knowing states with an affective and cognitive character. Overall, it appears that during the course of a cognitive task, metacognitive knowledge, metacognitive experiences and metacognitive skills are continually informing and motivating one another. In conclusion, metacognition refers to the information and abilities that are utilized to manage one's cognition.

Keywords: *Meta-Cognitive Skills, Meta-Cognition, Planning, Knowledge and Critical Thinking*

INTRODUCTION

Metacognition is a relatively recent idea that can have a significant impact on learning. Students' self-awareness of their own degree of comprehension is referred to as metacognition. Metacognition is a good indicator of inadequate study methods. Teaching is a dynamic and complex phenomenon involving teachers, students and subject matter. The efficiency of teaching learning process has a very close relation with, the teachers teaching and learners learning. The main aim and efforts in education is to enhance students' learning and achieve success. Metacognitive skills facilitate such learning abilities. Developing learners' metacognitive skills holds many advantages for learning. The development of metacognition enables students to practice learning independently which in turn builds fluency and mastery of the skills. Metacognitive strategies do not emerge spontaneously. They are the outcome of the cognitive system's long-term evolution says Wood and Anderson (2001). They can monitor their own performance too. Teachers need to develop these strategies among learners (Lin, 2001). Learners must practice them in an atmosphere that encourages learning.

THEORETICAL BACKGROUND

The idea of purposeful, deliberate, and goal-oriented thinking is related to Jean Piaget's developmental psychology (Parvathi, 2014). This psychology has had little impact on how practitioners, scholars, and the public see child and adolescent development. (Flavell,1963). A group of researchers in the 1960s and 1970s extended Piaget's work to answer questions about manipulating information rather than storing and retrieving it.

Over the course of 20 years, a lot of work was done that would later be called the "foundation" of Meta-cognitive research, which is about how people think. (Brown, 1978) Early research methods was primitive, therefore rigorous theories were not available. In the 1980s, cognitive psychologists, developmental psychologists, and educational psychologists work together to find ways to help people learn. This collaboration led to more advanced methods for measuring meta-cognition, which was the goal of this project. (Kluwe, 1982)

In 1990, researchers began to focus on learning judgments as people's interest grew in ongoing learning monitoring. (Nelson & Dunlosky, 1991) People studied at their own pace. To achieve this, special meta-cognitive techniques were employed. People were dissatisfied with the

researches on the basis of people's learning judgements and the correctness of those evaluations. There were two things that were needed to figure out how people thought about how well they thought about how well they thought about how well they thought about learning.

In 1994, Schunk described that Method codification and integration would be particularly useful in educational settings where students have some control over their studies. During study times, diverse study methodologies and knowledge application can produce an intuition without regulating consciousness. It takes a lot of academic self-management and studying, which means making conscious decisions and controlling your own behaviour. An individual's ability to use diverse techniques effectively determines the level of academic obligations placed on students.

CONCEPT OF METACOGNITION

Metacognition is the study of executive control over tasks. Flavell defined metacognition as "knowing one's own cognitive process and its effects, and actively monitoring and managing that cognitive process." Metacognition refers to the ability to monitor and control one's own cognitive activities as one is learning. As defined by Flavell, "knowledge and thought about cognitive events" is what he calls "metacognition" (Flavell, 1979).

A cognitive and metacognitive process is acknowledged by Brown (1978). Metacognitive processes are employed. A psychological construct, metacognition. A psychological construct is an intangible phenomenon that cannot be directly measured. Metacognition has two parts: knowledge and regulation (Flavell, 1987, Sternberg1986, Wolters & Baxter, 2000).

Metacognition refers to second order cognitions such as thoughts about thoughts, knowledge about knowledge, or reflections on actions (Papaleontiou, 2008). “The ability to reflect on, interpret, and manage one's learning” is metacognition Schraw (1994). Martinez (2006) defines metacognition as “thinking monitoring and control”. He clarifies that metacognition has “different roles as language” such meta memory, meta comprehension, problem-solving, and critical thinking. Metacognition is considered a conscious activity but there are some metacognitive activities that we perform automatically. In complex cognition, conscious and automatic processes typically complement each other (Martinez 2006). As defined by Marzano (2000), the metacognitive system “commands and supervises all other systems.” These definitions provide light on metacognition as a higher order cognitive activity that

monitors and controls our thought processes. All of the previous definitions helped us understand the idea of metacognition.

TYPES OF META COGNITION

The learner who have metacognitive development can adapt to any learning environment, assess their own progress, and control their own cognitive development (Kluwe, 1982; Brown, 1987; Kuhn, 2000). Metacognition is divided into two parts: awareness of one's own cognitive processes and direct control over those processes. There are two broad categories of metacognition discussed in the earlier sections.

Knowledge of Cognition (KoC) is reflective information that includes declarative, procedural, and conditional knowledge. It refers to a person's understanding of their own and others' minds. Long-term memory refers to the ability to recall knowledge that hasn't changed over time. There are three categories of metacognitive knowledge: declarative knowledge, procedural knowledge, and conditional knowledge (knowing when and why). Declarative knowledge concerns oneself (Hartman,2001; Schraw, Crippen and Hartley, 2006). A task's substance or length is not a measure of procedural understanding. Knowledge of techniques or procedures to achieve a desired goal. Domain-specific procedural and declarative knowledge (Schraw, Crippen and Hatley 2006; Zohar and David 2009). Conditions include knowing when to employ declarative or procedural knowledge. The ability to appraise a learning circumstance and then select the most appropriate strategy is conditional knowledge (Schraw, Crippen and Hatley 2006; Zohar and David 2009).

Regulation of Cognition (RoC) is the control component of learning. Regulators of cognition are people who understand how pupils plan, implement, monitor, correct, and assess their learning (Schraw and Dennison, 1994). Activities that help pupils control their learning are called cognitive regulation activities. The three fundamental classroom skills are planning, monitoring, and assessing. Planning involves selecting effective tactics and utilizing resources to improve performance. It comprises task breakdown, time management, attention, and filtering out distractions. Monitoring is the ability to improve with practice. Evaluating refers to assessing the effectiveness of one's education. For example, it entails assessing the effectiveness of the pupils' learning practices. They identified three metacognitive skills: planning (choosing the

optimal techniques and allocating resources to help you succeed), monitoring (awareness of how well you're doing and understanding), and reflecting on your learning results.

METACOGNITION SKILLS

Metacognitive skills are essential for organising all of our daily activities. There are numerous benefits to using these tools for planning, creating objectives, commencing job activities, sustaining future-oriented problem-solving, tracking progress on projects to identify and fix faults, and keeping track of the impact of one's behaviour on others, among others. Students with metacognitive needs struggle to plan and manage their own work from start to finish. They may also struggle to seek help when they are unable to start, finish, or meet deadlines. According to Pressley, Borkowski& Schneider,1987 "Metacognitive skills enable learners to monitor and direct their own learning processes." Learning metacognitive skills often involves the following processes:

1. First, they provide an incentive for learning metacognitive skills. Such a situation arises when either they or someone else points out that learning how to apply a procedure will be beneficial.
2. People who are good at metacognition pay attention to what they are doing or what someone else is doing that is valuable for them. As a result of this improved concentration, the relevant information is stored in the brain's working memory. There are two ways in which this focusing of attention might take place: through modelling and through direct experience.
3. They engage in metacognitive conversation with themselves. This self-talk serves a variety of goals, among them a. It gives them the ability to comprehend and encode the procedure. b. It gives them a chance to get some practice in. As a result, they are better able to get feedback and make improvements to their use of the process. They can employ the method in a variety of different contexts, allowing them to adapt it to new situations.
4. They eventually start using the procedure without even realising it. There is a significant link between higher order metacognitive skills and fundamental or factual skills that may be part of a given education unit. Students generally gain metacognitive skills while studying other skills. To achieve this successfully, learners must have over-learned the prerequisite content knowledge for the subject matter issue examined. The topic content will overload the learner's working memory, leaving no opportunity for metacognitive evaluation. It's crucial not to do too

much thinking for pupils when helping them. Adults or competent peers who aid youngsters may become experts at seeking help rather than excellent thinkers. Adults may help children become autonomous and competent thinkers by assigning tasks at the appropriate level and prompting children to reflect as they finish them. So, rather than just instructing youngsters what to do, ask them, "What should you do next?" and then prompt them as needed.

Metacognitive skills help us organised our tasks. In addition to allowing for better work organization and error detection, they also allow for tracking the impact of one's actions on others. Metacognitive skills enable you to understand, regulate, and control your own thinking activities. Basically, you learn to learn. It is critical to understand the learning process and your personal strategy. Students with metacognitive needs can't plan and manage their own work from start to finish. They may also have trouble asking for help when they can't start, finish, or meet deadlines. Metacognitive abilities are essential in both school and life. According to Mumford (1986) characterizes this person as someone who knows how to apply off-the-job learning to on-the-job problems.

DEVELOPMENT OF METACOGNITIVE SKILLS

Metacognitive skills are thought to develop between the ages of 8 and 9 (Veenman, 2011), but children younger than 8 may be able to use proto-metacognitive skills provided assignments are customized to their level of comprehension. Even 5 year olds can plan and self-correct in simple settings like distributing dolls over a restricted number of chairs (Whitebread et al., 2009). Metacognitive abilities appear to start out simple in infancy, but they grow in sophistication and focus on academics as children progress through school (Veenman,2011). From the age of 8 years old, children show a big rise in the number and quality of their metacognitive skills (Alexander et al., 1995; Schmitt & Sha, 2009; Veenman & Spaans, 2005; Veenman et al., 2006). This growth in metacognitive skills lasts well into adulthood, and it doesn't stop (Veenman et al., 2006; Weil et al., 2013). Individual differences in metacognitive skills can be seen at all ages, which suggests that metacognitive skills grow at different rates for different people. (Marcel V.J. Veenman, 2011).Before the age of 14, children's metacognitive skills cover a lot of ground or have a specific focus. Children may use different metacognitive skills when they read, solve problems, or learn new things (Van der Stel & Veenman, 2010; Veenman & Spaans, 2005). "Metacognitive skills may first emerge on different islands of tasks

and domains which are extremely similar," say Veenman & Spaans (2005). In contrast, metacognitive skills become more generalised at the age of 14. They can be used in many tasks and professions. (Van der Stel & Veenman, 2014).

The goal of this study was to improve students' metacognitive skills so that they could do better in physical science by giving them metacognitive interventions (for metacognitive support). As part of the research for this project, it has been broken down into metacognitive strategies and metacognitive support.

STRATEGIES FOR DEVELOPING META-COGNITION

Nair et al. (2004) suggested the following tactics for improving meta-cognition in children.

1. **Planning Strategy:** Teachers should provide students with a list of techniques and processes to solve issues, rules to remember, and instructions to follow before beginning any learning activity.
2. **Choosing consciously:** Teachers can provide their pupils the freedom to choose and choose what they want to learn and how they want to study it.
3. **Modeling:** Teachers' modelling has the highest chance of influencing their students. Modeling and conversation help students build the vocabulary they need to express their own thoughts. Teachers who display metacognition in front of their students develop students who do the same.
4. **Asking thought provoking questions:** It forces students to define their terms operationally and evaluate the assumptions that underlie their reasoning. It's also a good idea to spell out the steps students take to solve a problem.
5. **Clarifying pupil terminology:** Pupils frequently utilize hollow, ambiguous, and non-specific language. Teachers need to explain them in depth so that the meaning and values can be fully understood by the school students.
6. **Paraphrasing:** Students should be encouraged to reinterpret, translate, compare, and paraphrase the thoughts of others. It would make people better listeners to others' thoughts, but also better listeners to their own thoughts.

For a basic understanding of meta-cognition, the above-mentioned literature is useful. Students learn executive control of behaviour through evaluation, planning, and regulation. These steps should be performed before, during and after tasks.

CONCLUSION

Metacognition is critical for students' intellectual achievement and development. Student success in the classroom is closely tied to the development of their metacognitive abilities which include the ability to assess the quality of their own progress in the classroom, evaluate their own performance on tough learning tasks and take charge of their own thinking in the face of challenges (Zimmerman & Moylan, 2009).Reasons for the growing interest in metacognition over the past three decades relate not only to the anticipated improvement in learning outcomes, through interventions that aim at developing students' metacognition, but also to the broader rise in interest in cognitive theories of learning. Metacognition is divided into two parts: knowledge and control (Flavell, 1976). Metacognitive knowledge is knowledge about how one's mind works, whereas metacognitive control is how one manages one's mind (Otani & Widner, Jr., 2005). It appears that metacognitive abilities are intertwined. A Meta cognitively adept student will focus on relevant information in the task assignment, necessary for creating an adequate task representation. The metacognitive skill component refers to the control of an individual's ongoing cognitive processes. Recently, most researchers' definitions lie in between (Schneider and Weinert, 1990; Veenman, 1993): Metacognition is conscious or at least accessible to consciousness when difficulties during task performance such as comprehension problems or errors occur.

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