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Fostering Metacognitive Teaching Strategies in Nigerian Schools: Challenges and Solutions

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ABSTRACT

Metacognition is thinking our thinking and control of thinking for learning. Metacognitive teaching strategies have the potential to influence students' learning and performance. Evidence-based metacognition can develop with skilled practice, but many teachers and students in Nigeria struggle to substantially engage in metacognitive practices in the classrooms. This paper tries to look at the critical reasons for embedding metacognition in learning, what students and teachers should do, factors affecting what they do, and challenges they encounter when applying metacognition. The emphasis is narrowed down to fostering students' thinking by encouraging their learning styles or study skills, control, monitoring and facilitating social metacognition. Some recommendations have been derived from the study, which includes: encouraging teachers to apply metacognition to help students learning outcomes; to embed metacognition in the curriculum of schools in Nigeria, etc.

Keywords: *Metacognition, Evidence-based, Teaching, Strategies, Challenges, Solutions, Self-regulation, Personalized, Learning*

INTRODUCTION

Metacognition is thinking about one's own thinking. It refers to the processes used to plan, monitor and assess one's understanding and performance (Chick, 2013). Metacognition includes a critical awareness of (a) one's thinking and learning and (b) oneself as a thinker and learner. Metacognitive practices help students to become aware of their strengths and weaknesses as learners, writers, readers, test-takers, group members etc.

Full development and application of metacognition in schools will enhance students' outcomes due to its potentials to create critical awareness of one's own thinking, determination of strengths and weaknesses, encouragement of personalized and active learning strategies, which are pivotal to students' progress and teachers' professionalism. The noun, "fostering" in this context imply, encouragement or aiding the development of students and teachers to embrace metacognition as a learning and teaching strategy with the potentials to enhance learning and teaching. The adjective "evidence-based," imply a context that is based on facts rather than fiction. Metacognition is a practical concept with numerous benefits to students and teachers, but sadly almost sidelined in Nigeria's educational system. Stanton, Sebesta, & Dunlosky (2021) imply that students with well-developed metacognition can identify concepts they do not understand and select appropriate strategies for learning the concepts. They know how to implement strategies they have selected and carry out their overall study plans. Students can evaluate their learning strategies and adjust their plans based on self-feedback made possible by their learning outcomes. Tanner (2012) posits that "Education is an essay on promoting student metacognition." Metacognition makes students to be experts in thinking and efficient in learning. Students are also able to stimulate thinking in one another while learning in small groups this fosters social and collaborative skills among students. Metacognition involves metacognitive knowledge, which refers to one's critical awareness of learning and styles of learning; and metacognitive self-regulation, which refers to how one controls own thinking and monitors learning. Metacognition plays a vital role in enhancing learning and academic success. It involves being aware of and controlling one's cognitive processes, which leads to more efficient and effective learning (Ajayi, 2024).

Metacognition simply focuses on planning, monitoring and evaluating one's own learning processes and activities. In the long run, metacognition enables students to take ownership of their studies, leading to improved performance and lifelong learning skills. However, Ejide (2023) submits that students in Nigeria have usually been categorized as high or low achievers though they have the same exposure and same school environment, and to a considerable extent, to the same experiences. While a variety of factors including heredity, socio-economic status of parents and other background variables can account for the differences in academic achievement of students, one area in the teaching and learning processes not emphasized in Nigerian educational system is metacognition. Despite the rich benefits of metacognition the teachers face some challenges while trying to use metacognition strategies to improve students' learning and performance, hence this study to examine its applications, challenges and solutions in Nigerian schools.

Metacognitive Knowledge Base

Metacognitive knowledge base comprises knowledge of oneself as a learner which involves strengths, weaknesses, prior knowledge in the area of study, preferred time for study, best location and how the human brain encodes, stores, organizes and retrieves information (Pintrich, 2002). Therefore, students should learn effective learning strategies and how, when, to use them and why using them (Metcalfe, 2009). This knowledge base also includes knowledge of problems to be solved and the effective strategies to be used for solution of the problem. Students with better metacognitive mindset learn better than those without the mindset of metacognition.

Self-Regulation

This is one of the attributes of metacognitive learning which is not innate, but can be rather developed to help direct through the learning process. Developing the skill of self-regulation makes it possible for students to set clear and attainable goals for themselves and monitor their progress. Azvedo, & Cromley (2004) submit that the self-regulated learner typically engages in a 3-part process:

1. Planning: Set sub-goals, such as thinking about when and where to study or choosing strategies for a given task, examination or assessment format.
2. Monitoring: Reflect on how effective locations and strategies are, while studying. Think of what to do when obstacles arise and examine ones' understanding of the content being read.
3. Evaluating: Reflect on the outcome on the task and the effectiveness of the strategies used.

Students who indulge in self-regulation of their learning and school activities are most likely to improve their performances both in character and learning. Some students approach the four walls of the school without the vital perception of how to learn effectively for success. So, Indulging in self-reflection and self-regulation can make students become independent learners and rely less on the teachers, because they are able to understand which learning strategies are effective as they monitor their own learning.

Strategies to teach self-regulation to students includes: Teacher can organize a pre-class survey and entering behaviour to understand students' approach to learning and their previous knowledge. This can be a good opportunity to talk about the importance of self-regulated learning strategies to students for improved learning; also encourage students to plan their classwork in such a way that they will be doing it in bits daily, instead of rushing over it a day before submission; also encourage students to plan out their studies using the course outline or syllabus which will enable them to read or study ahead at their own pace; finally, provide students with feedback on how they are meeting course aims and goals or otherwise. This will enable them to know their academic standing and motivate them to improve their learning strategies.

RELATED LITERATURE

The researcher reviewed related literature on the basic concepts of the study. Evidenced-based metacognitive teaching strategies in Nigerian schools: challenges and solutions. This is based on secondary sources and direct observation.

Metacognition:

Teaching and learning styles are the behaviours and actions teachers and students exhibit in the learning trajectory. Metacognitive teaching strategies focus more on how students learn, and how teachers teach. This implies that students take up more responsibility for their own learning and are directly engaged in the learning process (Weimer, 2002). Metacognition, often described as "thinking about thinking," involves the awareness and active regulation of one's cognitive activities. This includes self-regulation, planning, monitoring, and evaluating one's understanding, performance, and learning approaches. Through the development of metacognitive skills, students can better understand their strengths, weaknesses, and preferences, and subsequently adapt their learning strategies accordingly, ultimately enhancing their academic performance and fostering habits of lifelong learning (Chowdhury, 2021). Metacognition, defined as the awareness and regulation of one's own cognitive processes, has been a topic of increasing interest in educational research and practice (Nath, 2016). Strategies for the enhancement of students' metacognition have been extensively discussed in the literature, as researchers and educators recognize the critical role that metacognitive skills play in academic achievement and lifelong learning (Roshanaei, 2014).

Integration into schools:

Kumari (2024) cited quasi-experimental study conducted by Zhao et al., where researchers investigated the effectiveness of integrating metacognitive instruction into a high school chemistry curriculum. The researchers introduced explicit metacognitive strategies, such as self-questioning, self-monitoring, and provided opportunities for students to apply these strategies during problem-solving activities. The study found that students who received the metacognitive instruction demonstrated improved academic performance, better understanding of chemistry concepts, and increased metacognitive awareness compared to the control group (Roshanaei, 2014).

Challenges:

Despite the well-documented benefits of metacognitive instruction, there can be challenges and barriers to its effective implementation in the classroom, noted that "Better metacognition, however, did not occur easily," suggesting that the development of metacognitive skills requires a sustained, holistic approach. Additionally, a review of the literature found that there are few studies that summarize specific instructional practices for improving students' capacity for metacognitive thinking, indicating a need for more research on effective metacognitive teaching strategies (Ellis et al., 2014).

Factors that Affect Students Activities

When students move to higher schools, they have increased responsibility for taking decisions about their learning and when to study with efficiency. At this stage, the students rely on their thinking or metacognition to make informed decisions. Empirical work has confirmed what teachers observe about the study habits of students, where many rely on passive strategies for learning. Students focus on reviewing material as it is written or presented, as opposed to connecting concepts and synthesizing information to make meaning. Some students use approaches that engage their metacognition, but they often do so without a full understanding of the benefits of these approaches (Karpicke et al., 2009). Students also tend to study based on exam dates and deadlines, rather than planning out when to study for real understanding, as a result they tend to memorize or cram (Hartwig & Dunlosky, 2012). Most students who do not embrace metacognition continue to cram materials for short-term rewards, unmindful of the fact that it does not encourage long-term retention.

Best Learning Strategies for Students

Planning is a crucial component of metacognitive strategies which involves setting clear objectives and devising a straight plan to actualize them. This enables students to organize tasks and assign relevant resources while anticipating possible challenges. Next, is to set a clear and attainable goal to provide focus and direction to the task ahead. Further defining the specific objectives will make students to understand what to accomplish before embarking on plans to achieve the objectives. Monitoring is the next in line in metacognitive strategies to evaluate one's learning progress. Employing the technique of self-questioning students can maintain awareness of their learning and take corrective action to improve their understanding (Ajayi, 2024).

Self-questioning techniques are valuable tools in metacognition that ensures that students engage in active reflection and inquiry about their learning process. By asking themselves questions before, during and after learning activities, students stimulate critical thinking, deepen understanding, and identify areas of confusion for attention. This technique involves asking some probing questions such as “what do I already know about this topic?” or “what information am I seeking?” Other questions like “Does this make sense?” or “Am I able to explain this concept to someone else?” enable learners to assess their comprehension and adjust their strategies accordingly. After completing a task, self-questioning facilitates reflection and evaluation. Students can ask themselves questions like “what did I learn from this?” or “What could I do differently next time?” This promotes awareness and encourages performance improvement (Ajayi, 2024). Self-questioning technique enables students to become active in their own learning, fostering deep understanding and critical awareness which obviously result in enhanced academic performance.

Benefits of Metacognitive Strategies

This concept offers a lot of benefits that significantly improve teaching and learning processes. The major ones include:

- Fosters self-awareness and self-regulation, which enables students to monitor their progress and adjusts learning styles accordingly.
- Personalized learning is guaranteed, since students exercise control over their learning.
- Increased critical thinking is ensured, since students analyze their thought processes and evaluate the effectiveness of their learning.
- Students tend to be motivated seeing their efforts result in improved learning outcomes.
- Metacognitive skills acquired by students which includes problem-solving, goal-setting, self-awareness and self-regulation can be transferred to new situations in life.
- Metacognition helps learners to become more active and focused, which can lead to improved academic performance.
- Metacognitive reflections can help students consolidate their learning and retention.

Integrating metacognitive strategies into the curriculum of schools will surely enable students to abreast with the tools and mindset to become efficient lifelong learners.

Application of Metacognitive Strategies in the Classroom

Applying metacognitive strategies in the classroom entails providing enabling conditions that will ensure critical thinking, self-awareness, and self-regulation in students. Teachers should apply metacognitive teaching practices through known teaching strategies, learning opportunities and innovative supportive roles: Metacognitive teaching practices which the teachers can apply in the classroom include: modeling goal-setting, sub-goals, goal-implementation, monitoring, self-awareness, self-assessment; guiding students to identify learning objectives, planning robust approach to solution of tasks and assignments, and objectively monitoring their progress on tasks. In classroom practice of promoting student metacognition, Tanner (2012) offers a handful of activities for biology classes, but they can be adapted to any discipline. She first describes four assignments for explicit instruction (p. 116):

- Pre-assessments – Encouraging students to examine their current thinking, where students will ask themselves this question: “What do I already know about this topic that could guide my learning?” What information will I seek for this topic?” These questions will help students to set goals and objectives, focus attention and tap assumed relevant knowledge or prior knowledge.
- The Muddiest Point – Giving students practice in identifying confusions:
  “What was most confusing to me about the material explored in class today?” “Can I clearly explain this concept to another person who could not attend the class?” This will help students to evaluate their understanding and adjust learning strategies if necessary.
- Retrospective post-assessment – Pushing students to recognize conceptual change: “Before this course, I thought that evolution was…….Now I think that evolution is….. “How is my thinking changing (or not changing) over time? “What did I learn from today’s concepts?”

- Reflective Journals – Providing a forum in which students monitor their own thinking: “What about my exam preparation that worked well, which I should remember to do next time? What did not work so well that I should not do next time or that I should change?” This encourages awareness and continuous improvement. Self-questioning enables learners to be active in their learning, gain deep understanding and ensures academic success.

Teachers’ role is that of a facilitator who provides feedback to students, guidance and encouragement as important support for development of metacognitive skills. Teachers can model or demonstrate metacognitive strategies by thinking aloud as they complete tasks or solve problems in the classroom. This enables the students learn how to effectively plan, monitor and evaluate their own learning. Ajayi (2024) adds that providing direct instruction on metacognitive strategies, such as goal-setting, self-questioning, and reflection equips students with the tools they need to manage their learning independently. Offering objective feedback on students’ planning, monitoring, and reflective skills enables them to identify areas of improvement, and cybernetics. Teachers should also encourage collaborative learning strategies in the classrooms. Collaborative learning skills such as peer-tutoring, small group discussion, jigsaw and think-pair-share, enables the learners to share and compare their approaches to tasks, resulting in metacognitive awareness. Teachers encourage students to be more effective as personalized learners who can plan, monitor and evaluate their own learning experiences with confidence, by using these metacognitive instructional methods.

Challenges in Implementation of Metacognitive Practices

Application of metacognitive practices in Nigerian schools can present some challenges despite its enormous advantages. These perceived challenges however, can be solved with thoughtful considerations, willful innovation and policy support:

- **Teachers’ inadequacies:** Many teachers do not have sufficient professional training in metacognitive teaching strategies to make significant impact on students. No teacher gives what he or she does not have without a good understanding of how to teach and support students with metacognitive teaching strategies.
- **Measurability:** It could be quite challenging for teachers to measure the level of metacognitive skills acquired by students because it is more personal and internal, which makes it difficult to significantly observe and measure.
- **Learning styles of students:** At the point of teaching and learning, students come to classroom with different learning styles, needs, aspirations, values, that teaching them with one-size-fits-all approach to metacognitive practices may not be very effective to all of them. Due to individual differences, some of the students may require more than metacognitive strategies to improve learning and understanding.
- **Resistance to change:** Some students in the same class may likely resist this innovation of metacognition which they see as extra task for them instead of being directly spoon-fed with knowledge by the teachers. When this happens, a barrier to learning valuable metacognitive skills has occurred and may lead to poor understanding and academic performance.
- **Limited time for instruction:** With the explosion of knowledge and subjects or courses infused into the curriculum of schools, teachers are confronted with tight schedules in the timetables that they are left with limited time to effectively apply metacognitive strategies in their teaching and lesson plans. For students to be significantly stimulated to think, plan, monitor and evaluate their learning will obviously require enough time for internalization and practice, which may be difficult with the often chocked timetable of lessons in Nigeria.

Solutions to the Challenges

Considering the numerous benefits of integrating metacognitive strategies in the curriculum of schools, it becomes imperative to proffer workable solutions to the challenges of implementation in the classrooms:

On the challenge of teachers’ limited knowledge of metacognitive practices, provision of professional development to teachers with a focus on using metacognitive strategies in the classroom will

surely change the narrative. They should be encouraged to collaborate with one another on metacognitive practices.

On the difficult measurability of the effectiveness of metacognition in students, relevant feedback can be gathered from students through surveys, and academic performance data can be monitored for significant improvements after an extensive application of metacognitive practices in the classroom.

On the different learning styles and backgrounds of students, a differentiated and individualized instructional strategies based on metacognitive strategies can be applied to take care of individual and learning differences of students. A variety of educational materials can be used in instruction to appeal to varied learning styles and needs of learners.

The students' possible resistance to innovation can be overcome by gradual but repeated explanations of the benefits of metacognition to learners. Motivate or arouse their interests through the use of real and concrete examples, because students learn better when they are exposed to what interests them.

Limited time for metacognitive instruction is obvious but should not hinder the learning and application of one's own thinking to improve understanding and outcomes through personal efforts. Metacognitive strategies as a teaching method should be integrated into the curriculum of schools to attract more consideration and uses, instead of seeing them as add-ons. For example, incorporate reflective questions at the end of regular lessons or use quick think-pare-share sessions (Ajayi, 2024). Teachers must tailor metacognitive instructional activities to fit within the allotted time of lesson without losing the objective and value of the discourse.

CONCLUSION

Integrating metacognitive teaching strategies in the classrooms and learning opportunities is important for promoting students' critical thinking, self-awareness, self-regulation, and improved academic performance. Any perceived barrier to implementation of this innovative method of teaching can be overcome by full integration of metacognitive practices into the curriculum of schools, continuous professional development of teachers, who are the chief implementers of innovation.

Teachers can motivate learners to become more independent and self-directed by demonstrating or modeling metacognitive learning opportunities, issuing real-time feedbacks, and ensuring a supportive learning environment. Students can develop critical thinking skills and awareness for lifelong learning through reflective activities, goal and objective setting exercises and collaborative small group discussions.

Support for teacher growth or continuous professional development of teachers with a focus on metacognitive practices will obviously get them better equipped with improved pedagogical skills, which will lead to improved student outcomes, adaptation to changing needs of the school system, and promotion of lifelong learning. Further government investment on professional development of educators with a focus on metacognitive skills and other innovative practices impact positively on students who are the direct beneficiaries of innovation in schools.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations are put forward:

1. Government through appropriate agencies should make sustained efforts to sponsor professional trainings to teachers at all levels on metacognitive teaching strategies and other innovative pedagogical practices, to support their competence which will in turn enhance their contributions to curriculum development and sharpen students' personal learning skills.
2. As a matter of policy, government should embed metacognitive strategies and practices into the curriculum of schools, instead of occurring as add-ons in the classroom instructions. This will enable teachers to prioritize metacognitive strategies in the classrooms and ensure that more time of practice is spent on internalization of this innovative teaching method by the learners.
3. School administrators should ensure that autonomy-supportive environments are created in schools to empower teachers in curriculum planning and implementation, through recognition of their perspectives and elimination of stressful activities on teachers.

4. Teachers should be encouraged to integrate metacognitive teaching strategies in the classrooms and learning opportunities for promoting students' critical thinking, self-awareness, self-regulation, and improved academic performance.

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