METACOGNITION FOR THE CLASSROOM AND BEYOND: A STRATEGY FOR TRANSFORMATION IN TEACHING AND LEARNING IN SPECIAL EDUCATION SUPPORT SERVICE

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Abstract
The paper discussed the value of metacognition to the teacher, and the learner in the school system. A concise analysis was carried out on how meta-cognitive skills training can benefit learners with Special Education Needs (SEN) and exceptionally able learners. Examples of SEN learners such as Dyslexia, Autistic Spectrum Disorder and Developmental Coordination Disorder were highlighted based on how metacognitive skills training may help them to improve their learning and working memory capacity. The paper concluded that meta-cognitive skills is increasingly becoming important in this modern era of technology and therefore recommended four ways of promoting it in the classroom.

Keywords: Metacognition, Thinking, SEN, Dyslexia, and Autistic Spectrum Disorder

The concise dictionary of psychology defines metacognition as having knowledge or awareness of one’s own cognitive processes (Statt, 1998 as cited in Okoza, 2013). The simplest definition of metacognition is just “thinking about thinking” – a notion that disguises much more complicated concepts that have kept scientist, philosophers, and educators puzzling for hundreds of years. Puzzles such as “how can we truly think about our own thinking,” when the brain that is doing the thinking is also the thing that is being thought about? (NCCA, 2007). Philosophical puzzles aside, metacognition can most usefully be thought of as knowledge and understanding of what we know and how we think, including the ability to regulate our thinking as we work on a task. While cognitive skills are necessary to perform a task, metacognitive skills allow us to understand how the task was performed (Garner, 1987). Metacognition refers to a complex array of skills,
understandings and dispositions which incorporate people’s developing awareness of their own cognitive processing, their knowledge about thinking and learning, and of tasks and strategies, and their developing ability to devise and select appropriate strategies to manage effectively their thought processes in learning and problem solving (Flavell, 1979; Brown, 1987; Veenman, VanHout-Wolters, & Afflerbach, 2006). Cognition is the scientific term referring to the mental process involved in gaining knowledge and comprehension, including thinking, knowing, remembering, judging and problem solving. Metacognition is knowledge and understanding of our own cognitive processes and abilities and those of others as well as regulation of these processes (NCCA, 2007). Consequently, Schoenfeld (1985) thought of metacognition as the ‘manager’ or ‘coach’ of a person’s learning: it guides information processing and monitors the effectiveness of various strategies being applied to a particular learning task. Metacognition is generally defined as the activity of monitoring and controlling one’s cognition. It can further be defined as what we know about our cognitive processes and how we use these processes in order to learn and remember (Ormrod, 2004). As individuals engage in any mental activity, in any knowledge domain, metacognition is a tool of wide application for solving many sorts of problems (Flavell, Miller, & Miller, 2002). Researchers further operationalize metacognition by splitting the term into two subcomponents, metacognitive knowledge and self-regulation. These two subcomponents have been theorized to be related to one another (Broom, 1987; Flavell, 1987; Schraw & Dennison, 1994). The concept of metacognition is quite appealing for educators concerned with the design of instructional tactics and study strategies. It is also consistent with social learning theorists’ notion of self-regulation as it provides the mechanism through which children begin to regulate one aspect of their lives – their own learning (Zimmerman, 1989; Smith, 1994).

Metacognitive knowledge is knowledge that we hold about our own thinking, and the thinking of other people. Metacognitive knowledge includes things like: (1) Understanding that having a strategy might help you to solve a problem more efficiently or that having an essay plan may help to keep your argument on track; (2) Knowing that it is more difficult to concentrate in a room that is noisy than one which is quiet; (3) Knowing that you are good at remembering people’s faces but not their names, while your friend is good with names, not faces (NCCA, 2007). Metacognitive knowledge consists of three subcomponents and each play a role in learning and problem-solving. These are declarative knowledge ‘knowing what’ which means knowledge of one’s own learning
processes, and about strategies for learning; Procedural Knowledge – “knowing how” which means knowing what skills and strategies to use and how to apply them; and conditional knowledge – “Knowing when” which means knowledge about why and when various learning strategies should be used (Schraw & Moshman, 1995; NCCA, 2007).

Self-regulation on the other hand, refers to a set of activities that help learners to control their learning. Research has shown that metacognitive regulation supports performance in a number of ways including understanding where to direct attention, using strategies more reliably and efficiently, and developing awareness of difficulties with comprehension (NCCA, 2007). Meta-cognitive regulation can be broken down into three component activities. These include planning, monitoring, and evaluating. Planning involves working out how a task might be approached before you do it. For example, you might make predictions before reading, select a strategy before tackling a problem, or allocating time or other resources before starting a task or work. Monitoring involves our awareness of our progress through a cognitive task and our ability to determine our performance. Stopping very so often to self-test and check for understanding is a good example of monitoring. Monitoring ability is slow to develop and even adults find it difficult, but it can be improved with training and practice (NCCA, 2007; Schraw & Moshman, 1995). Finally, evaluating involves taking a look at the outcome and determining if the learning outcome matches our learning goals and if the regulation processes we used were effective (Schraw & Moshman, 1995).

From the lenses of educational psychologist, it is perceived that people’s knowledge of their own learning and cognitive processes, and their consequent regulation of those processes can enhance their learning and memory. It stands to reason that if students have well developed meta-cognitive knowledge and meta-cognitive regulatory skills and they use their metacognition they will excel academically. Consequently, it is important to discuss the importance of metacognition as means of innovations and transformation in a teaching and learning. Therefore, the focus of this paper is to examine these vital issues:

(i) Why is knowledge of metacognition important for the teacher?
(ii) Why are metacognitive skills important for the learner?
(iii) How can metacognitive skills training benefit learners with special education needs (SEN) and exceptionally able learners?
(iv) Conclusion/Recommendations
(i) Why is knowledge of metacognition important for the teacher?
Meta-cognitive development in individual children varies widely. Poor learners show marked delays in metacognitive development (Campione, 1987; Watson, 1996). They have the metacognitive awareness of much younger children, they tend to overestimate the capacity of their memory, they fail to try different approaches, fail to see that similar problems can be solved by similar means (Sternberg, 1985). Pupils with learning difficulties fail not only because of less knowledge about tasks, but also because they fail to utilize the knowledge and skills they have, they tend not to plan, have no strategy in attempting tasks and do not monitor their progress. Metacognitive strategies are rarely taught explicitly to students. Teachers expect pupils to learn the material from the curriculum that they present to them. According to Bahrick (1984) factual information fades fairly quickly once a pupil leaves school – over 60% of it disappears within 2-3 years if it is not in constant use. What these studies point to is that what these pupils need is not only the most explicit teaching but also metacognitive help to improve their self regulation and monitoring of learning.

Developing metacognitive skills are also an important aspect of formative assessment or assessment for learning (NCCA, 2007). In order to maximize the benefits of learning experiences, pupils must be able to evaluate their own performance, isolate steps that they can take to help them to improve and work in a collaborative way with their teachers to decide on next steps. A knowledge of metacognition on the parts of both the teacher and pupils is an important factor in facilitating the assessment for learning process. Teachers need to encourage children to probe deeper into what they have said and what they think, through what has been called ‘empathetic challenge’ (Bonnet, 1994). Enquiring into a child’s thinking facilitate thinking. Metacognitive questions can offer the challenge children need to become conscious of their thoughts and feelings, either before, during or after an activity (Fisher, 1998). Therefore, teachers should endeavour to integrate metacognitive skills in the teaching - learning process explicitly.

(ii) Why are metacognitive skills important for the learner?

Metacognitive skills are tools that empower the learner. Pupils very often fail to see learning as cycle that involves revisiting previous work to see where it can improve, acknowledging the value of mistakes, and planning improvements on this basis (NCCA, 2007). Instead, research shows that they are inclined to attribute success to good luck and failures, to lack of ability (Dweck, 2002). Such faulty belief serves to make some students helpless, believing that there is little they can do to affect the outcome of the “lottery” of good grades (NCCA, 2007). Teachers should take the responsibility of
showing learners that they can be in control of how they study, how they organize their work, and how they reflect upon it and through this support, we encourage them to take responsibility for learning and demonstrate that it is an active process. Learning does not just “happen” if you sit in a classroom for long enough or read the same page enough times. The self-regulatory skills of planning, monitoring and evaluating are crucial for the student if they are to experience learning in the holistic manner intended in the learning circle (NCCA, 2007; Schraw & Dennison, 1994).

According to Kolb (1984) learning involves four steps:-(1) Experiencing which involves doing something in class, in school, out of school (2) having time to think about the experience – what happened? (3) Formalizing what is learned – what do the results imply. How do I influence it? (4) Deciding how to incorporate improvement into next experience – what will I do differently next time. These metacognitive skills are important for the learner as they encourage self-reflection. Training in meta-cognitive skills, collaborative reflection on work that involves more than just a single grade score, and practice at asking and answering questions that stimulate higher – order thinking are all activities that may help to move students beyond this helplessness to see themselves as agents in their own learning (NCCA, 2007).

How Can Metacognitive Skills Training Benefit Learners with Special Education Needs (SEN) and exceptionally able Learners?

Metacognition is an essential ingredient in intelligent behaviour. The challenge is for teachers to find ways to aid the child in developing awareness of self. A child with learning difficulties may learn a lot in class, but may not understand what is he or she is doing. How can we help such a child? And if there is one characteristic of very able or gifted children it is that they have more metacognitive awareness than less able peers (Sternberg, 1983). While metacognitive skills training can benefit pupils at levels of ability, it can have specific benefits for learners who have special educational needs or those who are exceptionally able.

Not all students with learning difficulties will have a lower than expected IQ. However, where this may be the case, a number of research studies over the past ten years have shown that meta-cognition and intelligence (typically measured as IQ scores) are related concepts but are not the same thing (Sternberg, 1983; & NCCA, 2007). The development of metacognitive skills does not depend strongly on IQ and metacognitive skills make a contribution to problem-solving performance that is independent of what we would expect IQ to explain. This means that meta-cognitive skills have a number of implications for the learners with SEN and exceptional ability.
Learners with SEN

Research suggests that learners with SEN possess less metacognitive knowledge about learning and problem-solving and are typically less proficient at self-regulatory aspects of metacognition. According to Porter (2002), pupils with intellectual disabilities may be less aware of how their minds work, have less knowledge about learning strategies, and although they can learn strategies, they are less likely to independently apply and monitor them. Learners with special educational needs may not develop their own theories of metacognition and understand why regulating their thinking is important without support. Pupils whose special educational needs affect their ability to organize information, stay focused on task, or comprehend information in context may benefit from metacognitive skills training that explicitly shows them how to look the bigger picture, and how to prompt or cue themselves to monitor their progress (Swanson, Christie, & Rubadeau, 1993).

According to Swanson et al. (1993) problem-solving performance in children with learning disabilities indicates that with high meta-cognitive skills did better than those with poorer metacognitive skills. Similarly, Lerner and Kline (2006) stated that “efficient learners use meta-cognitive strategies, but students with learning disabilities tend to lack the skills to direct their own learning. However, once they learn the meta-cognitive strategies that efficient learners use, students with learning disabilities can apply them in many situations (Lerner & Kline, 2006: 184). A cursory examples of special educational needs in children is briefly reviewed. Some of the most common academic areas in which children with a learning disability have problems are reading, written language and math (Hallahan & Kauffman, 2000, Lerner, 2000). The most common area for children with learning disability is reading, especially phonological skills, which involve being able to understand how sounds and letters match up to make words. Dyslexia is a severe impairment in the ability to read and spell. Pupils with dyslexia may also have difficulty organizing both personal belongings in readiness for learning and their cognitive activities such as higher-order thinking. In explaining the necessity for meta-cognitive skills training for pupils with dyslexia, Goldup and Ostler (2000) describes the challenges as;

The dyslexia child’s disorganisation...undermines his ability to keep track of books, pencils and pieces of paper... It lurks unseen and plays havoc with his thinking, planning, hypothesising and testing and even with his storage and retrieval processes, all of which need help, through support and strategies if he is to succeed.

Butler (1998) stated that pupils with SEN find difficulties in the following aspects of meta-cognition: (1)
recognizing task requirement, (2) selecting and implementing strategies (3) monitoring and adjusting performance. These identified problems in SEN can be corrected by metacognitive strategy training as presented below.

1. Giving explicit instruction clearly communicating expectations is vital, guiding pupils to interpret a task appropriately.

2. Cue pupils to actively analyse task requirements for themselves. Establish this as part of a routine every time an exercise is set. Work with pupils to break down the task into steps, and to recognize areas of uncertainty where they need further clarification before they begin.

3. Pupils can be supported in identifying the different types of strategies that are open to them and selecting the most appropriate for the task.

4. Planning is especially important—deciding criteria for how a task will be approached, the order in which stages will be tackled and how completion will be judged.


6. Developing awareness of the process of learning/problem-solving including the importance of keeping track.


Students with Autistic spectrum Disorder (ASD) may have difficulty with thinking flexibly and find it difficult to manage time and complete work. They may have a tendency to compartmentalize their thinking, for example viewing completion of a task as unrelated to its presentation (Goldup & Osler, 2000). Pupils with Development Coordination Disorder or Developmental Verbal Dyspraxia again may have substantially below-average motor coordination (crawling, sitting, walking, playing games, and the like) for the given age, intelligence and education (Colman, 2003). Skills development in terms of monitoring both academic task and emotional states may be beneficial for these particular learners, as well as well practice at planning a task before beginning and evaluating at the end (NCCA, 2007).

According to Gathercole and Alloway (2008) learners with SEN may in some cases have a working memory capacity that is below average for their age. Working memory is like a mental jotter, we use it when solving problem to keep two or more pieces of information “alive” in our minds at once so that we can manipulate them for calculations, or relate them in complex ways. Pupils with poor working memory skills may have difficulty concentrating or frequently lose their place when taking
They can find it difficult to keep a list of 3 – 4 directions in mind in the classroom, perhaps completing the first and then forgetting what else they were supposed to do (Gathercole & Alloway, 2008). Tentative research evidence suggests that children who have poor working memory capacity can use metacognitive knowledge and skills to compensate for this deficit. Whitebread (1992) posits that there are likely many benefits of teaching pupils with working memory problems the metacognitive skills to monitor their performance and regulate their behaviour.

**Exceptionally Able Learners**

Exceptionally able pupils generally have higher levels of metacognitive knowledge than other children. They are more aware of constraints on their learning such as memory limitations and attentional distractions, and they can think of more learning strategies to apply to any given time. However, research findings regarding self-regulation are more mixed, and it appears that exceptionally able pupils do not necessarily excel in this regard (Steiner & Carr, 2003). In studies of reading comprehension for example, high ability students were no more likely to pick out blatant inconsistencies in the text than readers of average ability. Based on the fact that metacognitive knowledge supports self-regulation however, there is the possibility that if given the opportunity to practice self-regulatory skills on task, exceptionally able students may improve this ability quickly and indeed at a faster pace than other students (Steiner & Carr, 2003).

One of the cognitive advantages that almost all pupils who are identified as exceptionally able possess is a large working memory capacity. This often allows them to take shortcuts when it comes to planning, as they can keep more information in their heads. Further, the frequent high grades achieved by exceptionally able pupils can mean that they do not see the need for self-reflection and evaluation of work. In the senior years of secondary school however, when work becomes more demanding and perfect grades may no longer be so readily achievable, able students can experience a blow to their confidence and may be unwilling to push themselves for further challenges if they think they cannot succeed. Training in metacognitive skills such as monitoring and self-reflection are important for exceptionally able pupils in this respect (NCCA, 2007).

**Recommendations**

Metacognition is effortful. A classroom that values metacognitive skills will support and develop higher-order thinking beyond the recall of information. Consequently, this paper recommends four ways to increase the occurrence of metacognitive behaviours as suggested by Schraw (1998 as cited in Okoza, 2013):
1. Make pupils aware of the importance of metacognition
2. Improve knowledge of cognition
3. Improve regulation of cognitive activities, and
4. Foster learning environment that value and promote metacognitive awareness.

The onus is on teachers to make time for planning their classes, to promote students to monitor as they work, and to build in time for reflection on class work, homework and other external activities beyond the classroom.

**Conclusion**

In any cognitive enterprise a variety of information processing activities may go on. In teaching young people, the aim of the teacher is to do more than just telling them what to learn. Psychological research into memory suggests that 60% of the factual information learned at school is forgotten within 2 – 3 years of leaving. So once that is gone, what are we leaving our students with? Beyond factual knowledge, teachers should strive to equip children with the tools and skills to allow them to learn how to learn – metacognitive awareness of learning strategies that consist of metacognitive knowledge and metacognitive regulation. Metacognition is thinking about thinking which means higher-order thinking skills. This higher-order thinking process is becoming increasingly important in this modern era of technology in learning. McGuinness (2006) defines higher-order thinking as “the need for learners to go beyond the mere recall of factual information to develop a deeper understanding of topics, to be more critical about evidence, to solve problems and think flexibly, to make reasoned judgements and decision rather than jumping into immediate conclusions.” The teacher has enormous role to play if pupils are to benefit from metacognitive skills and using them independently. It is important that we model their usefulness and show that we value them day to day in the classroom. Consequently, it is important that teachers should integrate metacognitive skills in their classroom teaching to enhance the learning abilities of both normal, special educational needs, and exceptionally able students.

**References**


