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Improving quality learning among young children through meta-cognitive instructions

MANJU KANWAR RATHORE*[1] AND REETA SONAWAT[2]
[1]Assistant Professor and [2]Professor
[1]Department of Human Development and Family Studies, College of Home Science
S.K. Rajasthan Agriculture University, Bikaner (Rajasthan) India
[2]Department of Human Development, SNDT Women's University
Juhu Campus, Santacruz (West), Mumbai (M.H.) India

ABSTRACT

The early childhood years are the foundation years of life in which significant developments occur. If the child is equipped with better learning that would lead to an increased ability to perform in all areas of life. That can be employed through providing a rich environment for children to reflect about their own thoughts. With adequate experiences, they develop a healthy sense of industry and a confidence that they can master and control their worlds and learn fundamental skills as reading and arithmetic. They become more able to retrieve information and use it to solve new problems or cope with new situations. As young children learn from everything they do. They are naturally curious and they learn from exploration and discovery. If their explorations bring pleasure oar success, they will want to learn more. During these early years, children form attitudes about learning that will last a lifetime. Children must receive the right sort of support and encouragement during these years. This support and encouragement can be made concrete by employing meta-cognition. Within our existing education system there exists an inherent need to help strengthen the learning process of a child by employing newer methods of instruction, so that the child may develop to the best of his/her ability. This highlights the importance of a stimulating environment for the holistic development of young children. Hence different pedagogies in ECE centers to impart meta-cognition among young children can ensure quality learning among them.

Key Words : Early childhood years, Learning, Experiences and Meta-cognition

INTRODUCTION

In early years a child grows and develops in relation to being physically healthy, mentally alert, emotionally sound, socially competent and ready to learn. The first five years of a child's life are fundamentally important. They are the foundation that shapes children's future health, happiness, growth, development and learning achievement at school, in the family and community, and in life in general. In these years development of the child's brain takes place. Early experiences provide the base for the brain's organizational development and functioning throughout life. They have a direct impact on how children develop learning skills.

Learning depends, in part, on the effective use of basic cognitive processes such as memory and attention, the activation of relevant background knowledge, and the deployment of cognitive strategies to achieve particular goals. It becomes necessary to cater the child's knowledge, experiences, goals, and actions, so as to help children grow and develop to their maximum potential. These meta-cognitive elements have relation with their success in school life and in social life. If we need to enhance the learning in children, we need to understand how a child thinks about his/her own thinking (meta-cognition) as well as observe the meta-cognitive instruction

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being given to a child in a classroom.

To ensure that the basic processes are used effectively, that the activated knowledge is indeed relevant, and that appropriate strategies are being deployed, learners also need to have awareness and control of their cognitive processes. This higher-level cognition was given the label meta-cognition by American developmental psychologist Flavell (1976). He describes meta-cognition as one's knowledge concerning one's own cognitive processes and products or anything related to active monitoring of consequent regulation and orchestration of these processes. This definition emphasizes the executive role of meta-cognition as a regulatory process. Executive process refers to those processes which are responsible for the goal-directed processing of information and selection of action. It is also said as "cognition about cognitive phenomena," or more simply "thinking about thinking". Ann Brown, a well-known researcher in the field of psychology defines meta-cognition as the understanding of knowledge, an understanding that can be reflected in either effective use or overt description of the knowledge in question (Brown, 1978). Most recently meta-cognition has been defined in cognitive psychology as a form of executive control involving monitoring and self-regulation (Lai and Viering, 2012).

According to Flavell (1979) meta-cognition consists of both **meta-cognitive knowledge** and **meta-cognitive experiences or regulation**.

1. Meta-cognitive knowledge refers to acquired knowledge about cognitive processes, knowledge that can be used to control cognitive processes.

Flavell further divides meta-cognitive knowledge into three categories:

(i) Knowledge of person variables: knowledge of person variables refers to general knowledge about how human beings learn and process information, as well as individual knowledge of one's own learning processes. For example, you may be aware that your study session will be more productive if you work in the quiet library rather than at home where there are many distractions.

(ii) Knowledge of task variables: Knowledge of task variables includes knowledge about the nature of the task as well as the type of processing demands that it will place upon the individual. For example, you may be aware that it will take more time for you to read and comprehend a science text than it would for you to read and comprehend a novel.

(iii) Knowledge of strategy variables: knowledge about strategy variables include knowledge about both cognitive and meta-cognitive strategies, as well as conditional knowledge about when and where it is appropriate to use such strategies.

Corresponding to Flavell's categories of meta-cognitive knowledge, Schraw and Dennison (1994) also considered these following three categories of meta-cognitive knowledge:

(i) Declarative knowledge:
- The factual knowledge the learner needs before being able to process or use critical thinking related to the topic
- Knowledge about, what, or that
- Knowledge of one's skills, intellectual resources and abilities as a learner
- Students can obtain knowledge through presentations, demonstrations, discussions.

(ii) Procedural knowledge:
- The application of knowledge for the purposes of completing a procedure or process
- Knowledge about how to implement learning procedures (e.g. strategies)
- Requires students know the process as well as when to apply process in various situations
- Students can obtain knowledge through discovery, cooperative learning, and problem solving.

(iii) Conditional knowledge:
- The determination under what circumstances specific processes or skills should transfer
- Knowledge about when and why to use learning procedures
- Application of declarative and procedural knowledge with certain conditions presented
- Students can obtain knowledge through simulation.

2. Meta-cognitive Regulation:

Meta-cognitive experiences involve the use of meta-cognitive strategies or meta-cognitive regulation (Brown, 1987). Meta-cognitive strategies are sequential processes that one uses to control cognitive activities, and to ensure that a cognitive goal (e.g., understanding a text) has been met. These processes help to regulate and oversee learning, and consist of planning and monitoring cognitive activities, as well as checking the outcomes of those activities.

Sub-components of meta-cognitive regulation by Schraw and Dennison (1994):

(i) Planning:
- Planning, goal setting, allocating resources prior to learning.

(ii) Information management strategies:
- Skills and strategy sequences used to process information more efficiently (e.g. organizing, elaborating, summarizing, selective focussing)

(iii) Comprehension monitoring:
- Assessment of one's learning or strategy use

(iv) Debugging strategies:
- Strategies used to correct comprehension and performance errors

(v) Evaluation:
- Analysis of performance and strategy effectiveness after a learning episode

Development of Meta-cognition:

This section provides the literature on the meta-cognitive capacities of pre-K and elementary-aged children, followed by an investigation of how meta-cognitive strategies appear, develop, and improve over time with age.

Piaget called thinking about thinking 'reflective abstraction', and said that this develops in children through their growing awareness of different viewpoints and the experience of self-conflict when their understanding is challenged. Researchers studying Piaget's work supports that young children are not capable of formal operations, which are necessary for abstract thought. The years from 4 to 9 see significant developments in children in their growing awareness of themselves as thinkers and learners. An illustration of this is provided by Istomina (1982) in studying the ways children of different ages set about a shopping task using a class shop. The 4 year olds ran impusively back and forth 'buying' things on their oral list, the 5 and 6 year olds tried to memorize what they had been told by asking for it to be repeated, the 7 year olds tried to make some logical connections between items on their lists. Meta-cognitive development in individual children varies widely. Poor learners show marked delays in meta-cognitive devlopment (Campione, 1987, Watson, 1996).

Kuhn (2000) characterizes development of meta-cognition as the very gradual (and not always unidirectional) movement to acquire better cognitive strategies to replace inefficient ones. Schraw and Moshman (1995) posit that meta-cognitive development proceeds as follows: cognitive knowledge appears first, with children as young as age 6 able to reflect on the accuracy of their cognition, and consolidation of these skills typically evident by 8-10 years of age. Ability to regulate cognition appears next, with improvements in monitoring and regulation appearing by 10-14 years of age in the form of planning. Monitoring and evaluation of cognition are slower to develop and may remain incomplete in many adults.

Children spontaneously construct these theories as they come to reflect on their own thinking and learning. Kuhn and Dean (2004) portray epistemological understanding as a benchmark in the development of meta-cognition. According to this developmental framework, preschool children are realists, who equate believing with knowing. In other words, young children believe that everyone perceives the same thing, and all perceptions match external reality. By around age 4, however, children learn that some beliefs can be wrong. At this stage, called absolutism, children learn that two people's beliefs can differ, but only because one person is right and the other is wrong. By adolescence, most people recognize that even experts can disagree on certain topics. At this point, many descend into multiplism (or complete relativism), where everything is subjective, no beliefs can be judged, and all opinions are equally right. By adulthood, many people will have learned to tolerate some uncertainty, while still maintaining that there can be better or worse opinions to the extent that they are supported with reason and evidence (evaluative epistemology). Kuhn and Dean argue that there is very little that needs to be done to encourage children to progress through the first three stages; rather, it is progression to the fourth stage that requires some instructional effort.

Schneider and Lockl (2002) link development of

meta-cognition with development of declarative meta-memory, first evidenced by a child's understanding of mental verbs such as "know," "think," "remember," and "forget." Preschoolers and kindergartners appear to have a limited understanding of memory, but they seem to understand the terms. From the age of 4 years on, memory verbs can be correctly applied to describe mental states. Between the ages of 6 and 11, there appear to be large gains in procedural meta-memory knowledge. Prior to this time, children tend to over-estimate their memory performance, believing that performance is linked more strongly to effort than it actually is. By the age of 9 or 10, most children realize that task characteristics and use of strategies can make remembering more or less difficult, and students by the age of 12 can make more subtle distinctions in the differential effectiveness of various memory strategies. By this time, students are also able to self-regulate efficiently, in terms of allocating study time and attention. Development of strategic knowledge continues through adolescence and young adulthood, when students learn about interactions between memory variables, such as task characteristics, strategies, and effort.

Sperling *et al*. (2002) developed and administered a self-report instrument for measuring general meta-cognitive knowledge and regulation in children in grades 3-8. Empirical results validated the instrument's multidimensional approach to conceptualizing meta-cognition. Researchers found that mean scores on these instruments either decreased or stayed the same across grade levels. Thus, there was a slight tendency for younger students to earn higher meta-cognition scores than older students. The researchers speculated that because the instrument measures general meta-cognition rather than meta-cognition in the context of a specific subject, perhaps meta-cognition becomes more domain-specific as students age and acquire more specialized content knowledge. The study provided at least some support for this speculation, as correlations between scores on the self-report instrument and teachers' ratings of students' meta-cognition appeared to be weaker for older students (whose ratings were completed by teachers responsible for a single subject area) than they were for younger students (whose ratings were completed by teachers responsible for multiple subject areas). In addition, the relationship between general meta-cognition and achievement in reading and math was weaker for older students than it was for younger students. Thus, it is possible that meta-cognition is domain-general among younger students, but gradually becomes more domain-specific for older students. Thus Meta-cognitive growth is gradual throughout childhood, adolescence, and even into adulthood.

One cannot simply assert that an individual has or does not have meta-cognition. Meta-cognition is not a unitary construct, either across domains or within domains, nor is the deployment of a meta-cognitive strategy all or none. There are degrees in the effectiveness with which strategies can be applied. Children show primitive abilities to plan and check their activities on simple tasks during the preschool years, but even advanced students in higher education show meta-cognitive limitations on more difficult tasks.

Various meta-cognitive instructions to improve learning of young children:

Teachers who use meta-cognitive strategies can positively impact student's learning by helping them to develop an appropriate plan for learning information, which can be memorized and eventually routine. These strategies refers to methods used to help students understand the way they learn; in other words, it means processes designed for students to 'think' about their 'thinking'. As students become aware of how they learn, they will use these processes to efficiently acquire new information, and consequently, become more of an independent thinker.

When learners become conscious of their thinking, they can become aware of their strengths and the strategies that are useful to their own learning. Meta-cognitive instruction enables children to ask better question, which had a long term effect. Children can internalize such training for later use. In addition, the meta-cognitive instruction had a positive effect on the children's acquisition of skills, which enhance their motivation, curiosity and self-directed learning. This is known that every young children can begin to develop meta-cognition if given the right kind of environment and where attention is given to instruction for general skills, such as asking good questions, listening, monitoring thinking, planning and evaluating.

There are following meta-cognitive instructions which can be helpful for preschoolers:

1. The teachers should encourage to model and discuss strategies related to learning, discuss their own learning and how they made use of such strategies. There should be a common language used for instruction for discussing

meta-cognition. Children should be provided with ample opportunities to practice meta-cognition while learning small concepts (Thomas and Mee, 2005)

2. Hardman and Beverton (1993) suggested "meta-discoursal skills" which include showing children how to question, how to listen and take a positive interest in the group, skills of turn taking, including yielding a turn and maintaining or holding the floor, using discourse markers to aid the flow of the discussion and using nonverbal communication. These factors can be taught by content based approach of engaging children meta-cognitively through deliberately provide opportunities for children to practice and reflect on their discussion, to monitor and regulate their own contribution to the discussion, as well as become consciously aware of other people's need within the group.
3. Facilitator model own thinking for children. As they learn by watching elders. Teacher is saying his thoughts aloud show kids what you're thinking, or "thinking aloud."
4. Provide a well constructed and content rich task to children which they are going to solve in group. Similarly encourage them to ask questions related to task to peers.
5. Set a routine that sets the stage for deeper inquiry e.g. what do you think you know about this topic? What questions do you have? How can you explore the topic? Engage children in problem solving related to puzzles.
6. Ask children open ended questions related to planning a real journey or any favorite thing through which sense of cognitive regulation get enhanced.
7. Teacher can engage children in giving reflection on task that they have performed in classroom. As well as teacher can set routine for reflecting on how and why our thinking has changed.
8. Some computer aided games or applications can be given children to play with. There so many entry and exit points in such applications which allow them to develop meta-cognitive skills.
9. Role play can be organized on routine basis in which children develop meta-cognition through socially constructed means. They will learn the monitoring and language of the different aspects of meta-cognition.
10. Encourage children to involve in talk and non-verbal communication as much as possible. Ask them Meta-cognitive questions which should be:

– **Open-ended**. Give your child some space to reflect on his thinking: Can you tell me more about why you think that?
– **Non-blaming.** It can be hard to stay open when kids are acting out, but asking them to think about their behavior can help them learn to manage difficult situations in a better way: Why do you think you got so upset when Dad changed the channel?
– **Solution-focused**. Encourage him to think about how he can use his understanding to change things in the future: How could you handle that differently next time?
– **Process-oriented.** Ask questions that help your child get a better idea of how his thought process works: How will you know when this drawing is finished?

11. Set a routine for exploring interesting things in surrounding e.g. exploring a puzzle. Then inquire about what do you see? What do you think about that? What does it make you wonder?
12. Whenever possible, let children choose what they want to read and topics they want to learn more about. When they are genuinely interested and motivated to learn about a topic of study.
13. Think- pair –share can be inculcated by setting an active reasoning and explanation on any topic in peer group.
14. Circle of viewpoint can be organized through exploring perspective of all children on similar concept routinely.
15. Enhance their capability of interpretation with justification by asking questions like what is going on? What makes you say that?
16. A routine should be set for children for activating their prior knowledge and making connections with new knowledge.
17. Explain them how and why your thinking has changed and new response connects to your initial responses?
18. Facilitate and provide opportunities to notice thinking through pictures or assisted situation analysis.
19. Teacher should give the sensory interruption to

children if they are unable to understand or respond for some concept. They can provide the reasonable base behind the matter and can suggest useful strategy for learning e.g. visualizing.

20. Facilitator Scaffold the thinking of children. Step by step scaffold the learning. Expose them with new dimension of concept if he already knew something about the same. Firstly start at the beginning of noticing the thinking strategies, noticing what he knows, and notice if our strategies worked. Teacher should not start trying to implement new strategies before he knows what they are currently using as a strategy.
21. Encourage the rehearsing among children and train them to quiet the negative self-talk, instead encourage them to think positive and built a positive self concept.
22. Set some criteria for routine evaluation of learning and acquisition of new meta-cognitive skills.

Conclusion:

Meta-cognitive learning of children is possible through instruction. As more the child is able to understand his learning process the easier it will be for him to figure out what strategies and supports work best for him. This is the knowledge that will help him encountering the problems of present and future life. It will make him perfect in successful accomplishment of task assigned.

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