A BRIEF HISTORY OF METACOGNITION AND PRINCIPLES OF METACOGNITIVE INSTRUCTION IN LEARNING

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ABSTRACT

The very concept of metacognition has been the focal point of metacognitive instruction for many years. This paper provides a brief review of the history of metacognition and principles of metacognitive Instruction in learning. Two extensively used models of metacognition, namely Flavell's (1979) model of cognitive monitoring and A. L. Brown's (1987) model of metacognition have been presented in the subsequent sections of the paper.

KEYWORDS: Metacognition, Cognitive Monitoring, Metacognitive

INTRODUCTION

The very concept of metacognition has been the focal point of metacognitive instruction for many years. In the field of educational psychology, metacognition has been simply defined as thinking about thinking; Devine (1993) stated that metacognition is a form of cognition which includes active control over cognitive procedure.

The first researcher to introduce and use the term metacognition to the realm of educational and cognitive psychology was Flavell (1976). He used the term to refer to an individual's awareness of thinking and learning. He provided the following explanation: "Metacognition refers to one's knowledge concerning one's own cognitive processes and products or anything related to them, e.g. the learning-relevant properties of information or data" (p. 232). He also added: "Metacognition refers, among other things, to active monitoring and consequent regulation and orchestration of these processes in relation to the cognitive objects or data on which they bear, usually in the service of some concrete goal or objective" (p. 232).

The two facets of metacognitive awareness are metacognitive experiences or regulations and metacognitive knowledge. Flavell (1979) defined metacognitive experience as: "any conscious cognitive or affective experience that accompanies [*sic*] and pertain to any intellectual enterprise" (p. 906). In fact, metacognitive experience mentions the different adjustments a person makes to his/her cognitive processes to help manage and control his/her own learning. An instance of this in L2 listening is when a student is encountering a task of word recognition and abruptly remembers a similar problem that he or she was able to solve and handle in another listening event. As a result, the learner, using such a metacognitive experience, applies a similar strategy to solve and handle the new word recognition challenge.

Metacognitive knowledge, on the other hand, consists of an individual's beliefs and knowledge about themselves as thinking beings and many different approaches that can be used by them for learning. In the example just mentioned, the strategy choice of the learner depends on his or her previously existed metacognitive knowledge.

The term *the seventh sense* was used by Nisbet and Shuck smith (1986) to refer to metacognition. Metacognition,

also, has been appeared to be one of the essential prognosticators of learning (Wang, Haertel, & Walberg, 1990), and the benefits of metacognitive instruction have been irrefutable in areas such as listening, reading, and mathematics (Goh, 2008).

Regarding the fluctuating historical roots of metacognition in educational psychology, the study and the standpoint of metacognition have remained enigmatic (Georghiades, 2004). As stated by A. L. Brown (1987), "metacognition is not only a monster of obscure parentage, but a many-headed monster at that" (p. 105). Two extensively used models of metacognition, namely Flavell's (1979) model of cognitive monitoring and A. L. Brown's (1987) model of metacognition have been presented in the following sections.

FLAVELL'S MODEL OF COGNITIVE MONITORING

Flavell's (1979) proposed a model of cognitive monitoring including four interactive sub-parts: metacognitive knowledge, metacognitive experiences, goals, and strategies. According to Flavell (1979), metacognitive knowledge was defined as "that segment of your stored knowledge that has to do with people as cognitive creatures and with their diverse cognitive tasks, goals, actions, and experiences" (p. 906). In fact, this type of knowledge is the part of knowledge which deals with individuals as cognitive beings and considers their different cognitive tasks, aims, behavior, and experiences as well. It was later on when Wenden (1998), applied Flavell's model of metacognitive knowledge to the realm of L2 learning. This model of metacognitive knowledge makes up three different categories: person knowledge, task knowledge, and strategy knowledge.

Person knowledge included learners' general knowledge about humans as thinking organisms. Person knowledge comprised judgments about one's learning abilities and knowledge about internal and external factors that influence the success or failure in one's learning process (Vandergrift et al., 2006).

Task knowledge referred to learners' knowledge about the purpose, nature, and demands of learning tasks. It also involved knowledge about the difficulty differences between two specified tasks. Task knowledge could also enable the learners to consider factors that might be involved in difficulty of a task, together with the features of the oral message (Vandergrift et al., 2006).

Finally, strategy knowledge referred to learners' knowledge about using strategies to achieve cognitive goals. According to Nisbet and Shuck smith (1986), strategy knowledge could be useful for achieving learning goals and aiding the learners with having a choice in their strategy use and preference.

BROWN'S MODEL OF METACOGNITION

A. L. Brown (1987) proposed his model in which metacognition was composed of two dimensions: knowledge about cognition and regulation of cognition. Knowledge about cognition referred to what individuals knew about their own cognitive processes which facilitated the reflective aspects of metacognition (A. L. Brown, 1987). In additional studies, knowledge about cognition was characterized into declarative knowledge, procedural knowledge, and conditional knowledge (Jacobs & Paris, 1987). Declarative knowledge includes knowledge about oneself as a learner and about the factors that influence one's performance. Knowledge about self and strategies are other constituent parts of declarative knowledge (Schraw & Moshman, 1995). For example, one might know that goal-setting is an effective strategy before starting a learning task.

Procedural knowledge denotes knowledge about the execution of procedural skills and how to use strategies. Individuals with a higher degree of procedural knowledge use skills more automatically, are expected to structure strategies effectively, and use qualitatively different strategies to resolve problems and difficulties (Schraw & Moshman, 1995). Procedural knowledge, as mentioned, includes knowledge about how to use the strategies. For example, one might know how to set goals before going through a specific task.

Conditional knowledge refers to knowing when and why to apply various cognitive actions. In a better word it deals with utilizing declarative and procedural knowledge. It may be regarded as declarative knowledge about the relative utility of cognitive procedures (Garner, 1990; Schraw & Moshman, 1995). For example, before a doing a specific task, one might know that goal-setting would be much more appropriate. In A. L Brown's (1987) model, knowledge about cognition was characteristically stable, every so often imperfect, and frequently late developing. Conditional knowledge is important since it aids learners in selectively allot their resources and use strategies more efficiently (Reynolds, 1992). Conditional knowledge also allows learners to adjust themselves to the varying situational demands of a specific learning task.

Regulation of cognition referred to a set of activities that help the learners regulate and monitor learning, which facilitate the control or executive aspect of learning (A. L. Brown, 1987). A quantity of studies report noteworthy improvements in learning when regulatory skills and an understanding of how to use and apply these skills are contained within classroom instruction (Cross & Paris, 1988; Brown & Palincsar, 1989). Regulation of cognition entailed three metacognitive strategies: planning, monitoring, and evaluating strategies.

Planning included the selection of appropriate strategies and the allocation of appropriate resources that affect performance. Instances include making predictions before doing a task, sequencing strategies, and allocating time or thoughtfulness selectively before starting a specific task (Berieter & Scardamalia, 1987).

Monitoring referred to one's on-line and regular awareness of comprehension and presentation of a task. For instance being able to involve in self-testing periodically, while learning, is a good example. Studies also indicate that monitoring as ability develops quite slowly and is quite poor in children and even adults (as cited in Schraw & Moshman, 1995).

Evaluating strategies referred to assessing the products and regulatory processes of an individual are learning. They also referred to assessing the outcome of comprehension or the learning processes after accomplishing a task. Re-evaluating one's goals and conclusions after a specific task is a representative example for that.

According to A. L. Brown (1987), compared with features of knowledge about cognition, regulation of cognition was considered to be unstable and also age independent. That is to say, adults might not use strategies when solving a simple problem (unstable); young learners might not have the ability to monitor and regulate their strategies (age independent). Regulatory processes—planning, monitoring, and evaluation—may not be conscious or statable in many learning situations. One reason is that many of these processes are extremely automated, at least amongst adults. The second reason is that some of these procedures have developed without any conscious reflection and consequently are problematic to report to others (Brown, 1987).

PRINCIPLES OF METACOGNITIVE INSTRUCTION

As stated by Veenman, Van Hout-Wolters, and Afflerbach (2006), while metacognitive development can be learnt implicitly, it can be enhanced through explicit instruction. Veenman et al. (2006) identified three key principles for fruitful metacognitive instruction. The first was to mix metacognitive instruction with the subject matter to foster connectivity. The second was to notify the learners of the usefulness of metacognitive activities to have them make extra effort, and the third was to provide the learners with extensive prolonged instruction to ensure the maintenance of the metacognitive activities.

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