

## THE ROLE OF METACOGNITION IN THE LANGUAGE TEACHING PROFESSION

By

MOHAMMAD ALI SALMANI NODOUSHAN\*

### ABSTRACT

*Metacognition is a concept in psychology that refers to a variety of self-awareness process that help learners to learn better. It grew out of the developments over the past few decades of cognitive models of learning. This paper presents a brief overview of these models and discusses their main features. It begins with a discussion of behavioristic models of learning, continues with a discussion of cognitive learning models and ends in an elaboration of constructivist, humanistic and social interactionist models of human learning. This article then links these learning models to language learning and discusses how they can be applied to help language learners to achieve language competence.*

*Keywords: Metacognition, Constructivism, Interactionism, Humanism, Language development.*

### INTRODUCTION

One of the concepts that have emerged from work in cognitive sciences is that of metacognition. According to Livingston (2003), metacognition is one of the buzz words in educational psychology, but it is not always clear 'what is meant by metacognition'. Metacognition refers to higher order thinking that involves active control over the cognitive processes engaged in learning. Because metacognition plays a critical role in successful learning, it is important to study metacognitive activity and development to determine how students can be taught to apply their cognitive resources through metacognitive control (c.f., Georghiades (2004)). The term "Metacognition" is most often associated with John Flavell (1976), who proposed that metacognition consists of both metacognitive knowledge and metacognitive experiences or regulation. Flavell further divides metacognitive knowledge into knowledge of person variables, task variables, and strategy variables. Most definitions of metacognition include both knowledge and strategy components. Most individuals of normal intelligence engage in metacognitive regulation when confronted with an effortful cognitive task, but some are more metacognitive than others. The most effective approaches to metacognitive instruction involve providing the learner with both knowledge of cognitive processes and strategies and experience or practice in

using both cognitive and metacognitive strategies.

Metacognition is "knowledge about one's own cognitive processes" (Martini and Shore, 2008). "As a general term, metacognition refers to "a second-order form of thinking; thinking about thinking" (Gipps, 1994, p. 24). Metacognition includes a variety of self-awareness processes that help learners to plan, monitor, orchestrate, and control their own learning. Through metacognition, learners are not only aware of their own knowledge and thinking but are also in control of both of them (Flavell, 1976). In fact, metacognition functions in a discursive manner to connect the "autonomous learner" with "evidence-based" education, via the powerful scientific discourse of "cognitive psychology" (Issitt, 2007). This means that learners will think about what they are doing during each step of the learning process (Rand, 2005).

This kind of metacognitive awareness results in a form of sustained deep learning (SDL). Learners who employ metacognition in the learning process use particular strategies to control and set the pace of their own learning. Such metacognitive strategies hinge on self-questioning in order to:

- get the purpose of learning clear,
- create images of one's own learning process,
- search for connections and conflicts with what is already known, and

- Judge whether understanding of the material is sufficient for the accomplishment of learning tasks.

An essential aspect of metacognition is that learners control their own learning; this requires the learner's commitment to learning in order to be able to reflect on the meaning of the content to be learnt. Fisher (2007) argues that the development of metacognition in children is possible through what he calls dialogic teaching (i.e., involving young children in talking to think through philosophical discussion).

Over the past few decades, language teaching specialists have sought to develop theories of language learning (i.e., approaches to language teaching) that are informed, directly or indirectly, by the notion of metacognition. They range from purely neurolinguistic theories of information processing to social-interactionist theories of learning. This paper will attempt to shed light on these theories.

### 1. Traditional Instructional Theory

As Resnick (1989, p. 3) put it, "traditional instructional theory assumes that knowledge and skill can be analyzed into component parts that function in the same way no matter where they are used". This quotation from Resnick implies that traditional instructional theory is based on two tacit assumptions: (a) decomposability, and (b) decontextualization. These assumptions are quite frequently found in psychological theories of learning dated from the earlier part of the 20th century. Seen in the light of such an instructional theory, complex competencies could be broken down into discrete skills learnt separately, through developing individual stimulus-response bonds. This can be called the 'building-block' model of learning.

In the language teaching profession, this came to be known as the Divisibility Hypothesis. Language knowledge (or linguistic competence) was seen as a construct decomposable into skills and components. The skills included reading, writing, listening, and speaking, while the components included pronunciation, vocabulary, grammar, and rate and fluency. Not all skills required all the components. For example, writing as a skill did not

require pronunciation, nor did it require rate and fluency.

The idea was that complex skills could be developed later, although the old theory did not make clear how. Language teaching was based on a model of instruction that taught separate skills on the assumption that their composition into a complex performance can be reserved for some time later. That is, language learning was seen as linear and sequential. This was definitely based on behavioristic psychology which held that complex understanding has been occurred only when elemental prerequisite learnings were mastered (Shepard, 1991). This was so important that it became the rationale for grade-retention (i.e., redoublement) in schools worldwide: a student could not move on to a higher grade until the prior level was mastered repetition was the only way to remedy deficient skill acquisition. In other words, the teaching of higher order skills was delayed until the pre requisite skills in the hierarchy had been mastered. This, as Gipps (1994) noted, was the most serious legacy of the building-block model of instruction.

Another assumption of the traditional instructional theory was the notion of decontextualization. Decontextualization holds that "each component of a complex skill is fixed, and that it will take the same form no matter where it is used" (Resnick and Resnick, 1992, p. 43). This tenet of behavioristic learning theory resulted in the language teachers' use of contrived materials in the language classroom. Course-book content was not authentic; rather, it consisted of decontextualized and contrived materials that were taken to the class by the teacher and practiced through repetition drills. Teaching was inductive in the sense that the teacher did not focus on meaning; rather, the class focus was placed on the discrete form to be mastered by the students. This approach to language teaching came to be known as the structural syllabus.

Traditional instructional theory resulted in the emergence of several language teaching methods, in which chief among them are the Aural-Oral Approach (AOA), the Army Specialized Training Program (ASTP), and Audiolingualism. These language teaching methods were in vogue during the behavioristic psychology era. With the

emergence of cognitive psychology, however, the language teaching profession was revolutionized. New methods of language teaching were invented and became popular.

## 2. Cognitive Models of Learning

An alternative to the linear hierarchy of learning comes from work in cognitive and constructivist psychology (Tempelaar, 2006). Learning is no longer viewed as an external map that is transposed directly into the student's head. Rather, it is an organic process of re-organizing and restructuring as the student learns. In other words, learning is shown in terms of networks with connections in many directions. Cognitive instructional theory suggests that:

- (a) learning is a process of knowledge construction;
- (b) learning is knowledge-dependent; and
- (c) learning is tuned to the situation in which it takes place.

In cognitive theory, learning does not occur by recording information, but by interpreting it. As such, instruction should not be seen as direct transfer of knowledge, but as an intervention in an ongoing process of knowledge construction (Resnick, 1989). Students learn best by actively making sense of new knowledge. They learn by making meaning from new knowledge and by mapping it in to their existing knowledge map (or schema); hence, the constructionist models of learning. If, however, this happens within a shared social context, and with the help and support of others, the model of learning is called social interactionism.

Cognitive psychology, as delineated above, is concerned with the way in which human mind thinks and learns. Cognitive psychologists are therefore interested in the mental processes that are involved in learning. This includes such aspects as how people build up and draw upon their memories and the ways in which they become involved in the process of learning (Williams and Burden, 1997).

A brief overview of language teaching history reveals that in recent years cognitive psychology has had a considerable influence on language teaching methodology. Cognitive theories of language learning often require language learners to use their minds to

observe, think, categorize, and hypothesize, and in this way to gradually work out how language operates (Williams and Burden, 1997; Omaggio Hadley, 2003).

Although they stand in sharp contrast to behavioristic views of learning, cognitive learning theories are quite varied. They range from information-processing theories to constructivist theories. Information-processing theorists draw the analogy of the brain as a highly complex computer; they seek to explain the workings of the brain in terms of rules and models of how different aspects of learning take place. Examples of this approach are found in work, over the past few decades, of researchers on artificial intelligence. On the other hand, constructivist movement is mainly concerned with ways in which individuals come to make their own sense of the world (i.e., how they construct their own mental representations of reality). Constructivist movement is deeply rooted in Jean Piaget's developmental psychology and George Kelly's personal construct psychology. In the following sections, a brief overview of major cognitive theories of learning will be provided.

## 3. Information Processing Models

Learning, seen in the light of information-processing models, takes place in three phases. In the first stage, through selective attention, certain aspects of the environment are filtered for conscious processing. In the second phase, the learner is actively engaged mentally with the new input so as to make personal sense of it; this active mental engagement draws on selectively recalled prior learning (or schema). In the last phase, the learner structures the resultant learning in such a way as that it can be stored usefully in the long-term memory (Atkins, Beattie, and Dockrell, 1992).

Psychologists who take this approach to learning are mainly concerned with the way in which people take information, process it, and act upon it. Thus, such factors are attention, perception, and memory which become the focus of information-processing theories of learning. Information processing models often make claims about the kind of mental processes that will be necessary for effective learning to take place. They try to identify

precisely how and where any mal-functioning is occurring when a learner is displaying learning difficulty. Chief among the scholars who drew on such a perspective to learning are Atkinson and Shiffrin (1968), Best (1986), Flavell (1985), Gardner (1983), Klatzky (1980), Oxford (1990), and Wittrock (1986).

Within the tradition of information-processing models, one of the earliest theories was proposed by David Ausubel. In essence, Ausubel's theory of meaningful learning suggests that learning takes place in the human organism through a meaningful process of relating new events or items to the already existing cognitive concepts or propositions (Brown, 1994). Metaphorically speaking, the learner hangs new items on existing cognitive pegs.

As new material enters the cognitive field of the learner, it interacts with, and is appropriately subsumed under a more inclusive conceptual system. In other words, new material is subsumably provided that it is relatable to stable elements in the learner's cognitive structure. This process is referred to as subsumption, a term which is more or less synonymous to Piaget's concept of assimilation. Forgetting will also occur, but it is not haphazard; rather, it takes place in a quite systematic manner. Learners forget the details and nuances of the materials learnt (i.e., Points that they evaluate as being useless), but they retain the essence of what they have learnt. This kind of forgetting is called systematic forgetting. Systematic forgetting entails the idea that subsumed items are cognitively pruned in favor of a larger, more global conception which is, in turn, related to other items in the learner's cognitive structure. Systematic forgetting is sometimes called subsumptive forgetting, a term somewhat similar to Piaget's concept of accommodation.

In accordance with Ausubel's meaningful learning model, Smith (1975) noted that any learning situation could be meaningful if:

- learners have a meaningful learning set (i.e., a disposition to relate the new learning task to what they already know); and
- the learning task is itself potentially meaningful to the

learners (i.e., relatable to the learner's structure of knowledge)

Smith (1975) also noted that learners are able to make things meaningful if necessary and if they are strongly motivated to do so. This kind of meaningful learning is called manufactured meaningfulness. Structuring meaningfulness is often achieved through association whereby items are either associated in groups or with some external stimuli. Such an association results in enhanced retention. Our memory retains possession of materials that are associated to a larger number of other already known facts.

Ausubel's meaningful learning model accounts for a number of linguistic phenomena. A clear trace of systematic forgetting can be seen in what is commonly referred to as language attrition or the loss of second language skills. Attrition research has attracted a good number of researchers including Lambert and Freed (1982), Weltens (1987), Weltens and Cohen (1989), and so forth. One source to which the attrition of foreign language skills is often attributed to is the initial condition in which language acquisition took place. Lack of an integrative orientation towards the target culture has also been attributed to language attrition (Gardner, 1982). There are also claims that neurolinguistic blocking and left/right brain functioning can contribute to forgetting (Obler, 1982). Moreover, long-term forgetting has been found to apply to certain linguistic features such as certain lexical, phonological, and syntactic items and structure (Andersen, 1982). Olshtain (1989) claimed that some aspects of attrition can be explained as a reversal of the acquisition process. No matter which of these explanation for attrition of language skills is accepted, one point remains clear: a purely behavioristic explanation of learning is inadequate in explaining why attrition occurs. Yet, Ausubel's model of meaningful learning gives priority to the 'initial learning condition' as the cause of language attrition.

One of the major drawbacks of information processing models is that they are essentially mechanistic; they are not concerned with meanings or emotions. In other words, they do not place the potentials of the learners at the



center of attention. Speaking metaphorically, they assume that learning will emerge as a result of the functioning of such information processing systems as memory, attention, and so on. The learners are thought to be passive in this process.

#### 4. Constructivist Models

As a variant to information processing models, constructivist models seek to make prominent the role of learners in the process of meaning construction. Learners in a constructivist perspective are seen to bring a sense of personal meaning to their worlds (Sutherland, 1992).

Constructivist models of learning are deeply rooted in Piaget's developmental psychology (Piaget, 1974). Essential to Piaget's theory of learning are the concepts of construction and personal meaning. His theory is action-based in the sense that it is more concerned with the process of learning than with what is learnt (i.e., the product of learning). Piaget argues that we come to learn things as a result of our personal experiences, but we make sense of those experiences at different stages of our lives.

Learners, according to Piaget, learn as they pass through a series of stages of development throughout their lives. As young infants, they begin to explore the environment with their basic senses (i.e., the sensory-motor stage of learning). Abstractions, memory and imagination have no place in this phase. If there is no sensory perception of an entity, the entity does not exist. The next stage is the intuitive or pre-operational stage when the child's thoughts become more flexible and when memory and imagination (of a somewhat crude nature) come into play. For Piaget, an operation is an internalized action; it refers to the way in which actions become part of the imagination of the child. The pre-operational stage is followed by the concrete operational stage around age seven when the child comes to realize that operations can be reversed (e.g., ice that melts can be frozen again into ice). Finally, in the last stage of development, the child moves into the formal operations stage when reasoning and abstractions become possible.

Piaget emphasized that in all stages of development, the

child's developing mind is constantly seeking equilibration (i.e., a balance between what is known and what is currently being experienced). This is accomplished through an ongoing sequence of assimilation and accommodation. Assimilation is the process by which incoming information is changed or modified in the learner's mind to fit with already known materials. Accommodation, on the other hand, refers to the learner's subconscious attempt at changing and modifying already existing schemata to take into account new information. Taken together, assimilation and accommodation are synonymous to cognitive adaptation.

Another proponent of constructivism was Bruner who argued in favor of the priority of the development of conceptual understanding and cognitive skills and strategies over the acquisition of factual information. Bruner (1960) was in favor of the education of the 'whole person'; he saw the need to help learners 'learn how to learn' as a central element of involving the whole person in the process of learning. Bruner argued that learning in schools must have a purpose, and that that purpose should be to educate whole persons (i.e., all aspects of a person's existence including physique, mind, emotions, and so on should be educated). One of his most famous dictums is that "the foundations of any subject may be taught to anybody at any age in some form" (Bruner, 1960, p. 12).

To educate the whole person, Bruner argued, three different modes of thinking should be taken into account by educators: enactive, iconic, and symbolic. At the enactive level, learning can be achieved through the direct manipulation of objects and materials. At the iconic level, objects are represented by visual images. At the symbolic level, symbols can be manipulated instead of objects or mental images.

Another key constructivist figure is George Kelly who believed that any given individual is a scientist who is constantly seeking to make sense of his world (Kelly, 1955). People constantly make theories about the matrix in which they live; they try to apply these theories (or their mental templates) to any new entity or event they come across

and try to establish some kind of reasonable fit. As such, for Kelly, learning means developing one's own unique sense of information or events; Kelly's theory of learning is quite often referred to as personal construct theory. Kelly claimed that people "were active participants in deciding how to act and that they made such decisions on the basis of what made sense to them personally" (William and Burden, 1997, p. 7). Each person's individual construction of the world will depend upon their previous experiences, which will also influence how they anticipate what will happen in the future.

There is one important point central to all of the constructivist theory discussed hitherto: learners make (i.e., construct) their own personal sense of learning tasks, their environment, the teacher, and the actual process of learning. There may be little congruence between any given pair of individuals' personal constructs. This has an important implication for teachers and curriculum designers: the goal of education should be to help any given learner to find ways of reaching a common understanding together with others since the human enterprise depends on a shared reality. Learners' and teachers' emotions as well as their particular life contexts must, therefore, be considered as an integral part of learning. This goal is not achieved unless teachers and learners alike learn to avoid defensiveness. This point will be taken up in the next section.

### 5. Humanistic Models of Learning

Humanistic approaches to learning emphasize the importance of the inner world of the learner and place the individual's thoughts, feelings and emotions at the forefront of all human development. One of the most well-known figures in humanistic psychology is Carl Rogers. Although Rogers is not traditionally thought of as a learning psychologist, he had a significant impact on our current understanding of learning particularly in an educational setting. According to Rogers (1983), a human being is a "whole person" entity that consists of physical, cognitive, and emotional aspects all of which are involved in the process of learning. Rogers gives priority to the emotional aspect of human beings, a phenomenological perspective that stands in sharp

contrast to the behavioristic perspective adopted by Skinner (1957). According to Rogers, inherent in principles of behavior is the ability of human beings to adapt and to grow in the direction that enhances their existence. This entails that, in a nonthreatening environment, a person will form a picture of reality that is indeed congruent with reality and will grow and learn.

Rogers contended that the "fully functioning person" lives at peace with all of his feelings and reactions. He is able to be what he potentially is. He exists as a process of being and becoming himself. Such a fully functioning individual is open to his experience, is without defensiveness, and is able to create himself anew at each moment in every action taken and in every decision made (Curran, 1972).

The major implication of Rogers's perspective for education is that the focus should be moved away from teaching and towards learning. The goal of education is no longer a transfer of information from the teacher to the learner; rather, education should aim at the facilitation of change and learning. According to Rogers (1983), learning how to learn is much more important than being taught something from the superior vantage point of a teacher who unilaterally decides what shall be taught, and who denies learners both freedom and dignity. The teacher's establishing an inter-personal relationship with the learner will result in the facilitation of the learning task for the learner. Teachers are facilitators in the sense that:

- they discard their masks of superiority and omniscience;
- they have genuine trust, acceptance, and prizing of the students as worthy, valuable individuals; and
- they communicate openly and empathically with their students and vice versa.

The essence of Rogers's perspective boils down into the claim that if the context for learning is appropriately created, then human beings will learn everything they need. This is on a par with Freire's (1970) notion of empowerment of students in the classroom. Freire argued that learners are not banks to be deposited with information; rather, they should be liberated to negotiate learning outcomes, to cooperate with teacher and other

learners in the process of discovery, to engage in critical thinking, and to relate everything they do in school to their reality outside the classroom. The society and the educational system should provide students with such a support system (or scaffolding).

The works of Rogers (1983) and Freire (1970) and other educators of a similar frame of mind have, in recent years, resulted in a redefinition of the educational process. To say the least, they have changed the way classroom activities and materials are prepared; they have resulted in the emergence of classroom materials and activities that utilize meaningful contexts of genuine communication with persons together engaged in the process of becoming persons they potentially are.

## **6. Social Interactionist Models of Learning**

Closely related to humanistic approaches to education are the social interactionist models of learning. For social interactionists, children are born into a social world, and learning occurs through interaction with other people (Appel and Lantolf, 1994). Children start to make their own sense of the world through interaction with others. In this way, social interactionism is very much the theoretical underpinning to present day communicative language teaching methodology.

There are two key figures in the social-interactionist camp: Vygotsky, and Feuerstein. Central to the psychology of both Vygotsky and Feuerstein is the concept of mediation. Mediation refers to the role of others (e.g., teachers, parents, peers) play in helping children to learn by shaping and presenting comprehensible materials to them. For both Vygotsky and Feuerstein, the secret of effective learning lies in the nature of the social interaction between two or more people with different levels of skill and knowledge. The role of one with most knowledge is to find ways of helping the other to learn. This involves helping learners to move into and through the next layer of knowledge or understanding. This important person in the child's learning is known as a mediator.

Vygotsky (1978) believed that the mediator should help the child to learn by placing him in a zone of proximal development (ZPD). This term is used to refer to the layer of

skill or knowledge which is just beyond that with which the child is currently capable of coping. Working together with a mediator at a level that is just above a learner's present capabilities is the best way for the learner to move into the next layer of knowledge or skill.

On the other hand, central to Feuerstein's theory of social interactionism is a firm belief that anyone can become a fully effective learner. He believed that people's cognitive structures are infinitely modifiable, a belief that is often referred to as structural cognitive modifiability. No one ever achieves the full extent of their learning potential, but people can continue to develop their cognitive capacity throughout their lives. The effect of this will be cumulative (see Feuerstein, Klein and Tannenbaum, 1991). He believes that the mediator can shape the learning of the child. Mediation can also play a significant role in the transmission of culture.

## **Conclusion**

The points presented here show that learning theory has started out of purely behavioristic concepts of the early part of the 20<sup>th</sup> century into the recent concept of social interactionism. Since language learning is itself a kind of learning, it cannot be detached from learning theories (or learning psychology). Language teaching, as shaped by behavioristic views of learning, employed decontextualized and decomposable linguistic items, and often of a contrived nature, to help learners master a new language. This presumed mastery, however, was not what learners could achieve in reality.

The gradual move in psychology from behavioristic models of the early part of the 20<sup>th</sup> century to present-day social interactionist models resulted in a move in language teaching from the traditional grammar-translation and Audiolingual methods to present-day Communicative and Task-based language teaching methods. Over the past few decades, innovative approaches to language teaching have emerged as a result of the application of learning theories discussed in this paper. Constructivist models of learning for instances have resulted in the invention of the Natural Approach to language teaching by Krashen (1985). On the other hand

humanistic models of learning, have resulted in the emergence of such approaches to language teaching as Suggestopedia, Community Language Learning, and the Silent way. Finally, the social interactionist models of learning have motivated the development of current Communicative Language Teaching.

Recent approaches to language teaching are more fruitful in that they tend to render more reliable results. Students trained in language programs that employ models of language teaching that are informed by constructivism, humanism, and social interactionism tend to master a higher level of language competence. It can therefore be concluded that the language teaching profession has benefited from the move in learning psychology from behavioristic models of learning to social interactionist theories of today. Since present-day learning theories could not have come as that it had not been for a metacognitive trend in psychology that nurtured and motivated the practice of 'thinking about the process of learning', it can be safely claimed that language teaching profession has benefited from metacognition.

#### References

- [1]. Andersen, R. W. (1982). Determining the linguistic attributes of language attrition. In R. D. Lambert and B. F. Freed, (Eds.), *The loss of language skills*. Rowley, MA.: Newbury House Publishers.
- [2]. Appel, G., & Lantolf, J. P. (1994). Speaking as mediation: A study of L1 and L2 test recall tasks. *The Modern Language Journal*, 78(4), 437-452.
- [3]. Atkins, M., Beattie, J., & Dockrell, B. (1992). *Assessment issues in higher education*. Newcastle School of Education, University of Newcastle.
- [4]. Atkinson, R. C., & Shiffrin, R. M. (1968). Human memory: A proposed system and its controlled processes. In W. K. Spence and J. T. Spence (Eds.), *The psychology of learning and motivation: Advances in research and theory*. New York: Academic Press.
- [5]. Best, J. B. (1986). *Cognitive psychology*. St Paul, MN.: West.
- [6]. Brown, H. D. (1994). *Principles of language learning and teaching* (3<sup>rd</sup> ed.). Englewood Cliffs, NJ.: Prentice Hall Regents.
- [7]. Bruner, J. S. (1960). *The process of education*. Cambridge, Mass.: Harvard University Press.
- [8]. Curran, C. A. (1972). *Counseling learning: The whole person model for education*. New York: Grune & Stratton.
- [9]. Feuerstein, R., Klein, R. P. S., & Tannenbaum, A. J. (1991). *Mediated learning experience: Theoretical, psychological and learning implications*. London: Freund.
- [10]. Fisher, R. (2007). Dialogic teaching: Developing thinking and metacognition through philosophical discussion. *Early Child Development and Care*, 177 (6-7), 615-631.
- [11]. Flavell, J. H. (1976). Metacognitive aspects of problem solving. In Resnick, L. B. (Ed.), *The nature of intelligence*. Hillsdale, NJ.: Erlbaum.
- [12]. Flavell, J. H. (1985). *Cognitive development*. Englewood Cliffs, NJ.: Prentice Hall.
- [13]. Freire, P. (1970). *Pedagogy of the oppressed*. New York: Seabury Press.
- [14]. Gardner, R. C. (1982). Social factors in language retention. In R. D. Lambert and B. F. Freed, (Eds.), *The loss of language skills*. Rowley, MA.: Newbury House Publishers.
- [15]. Gardner, H. (1983). *Frames of mind*. New York: Basic Books.
- [16]. Georghiades, P. (2004). From the general to the situated: Three decades of metacognition research report. *International Journal of Science Education*, 26 (3), 365-383.
- [17]. Gipps, C. V. (1994). *Beyond testing: Towards a theory of educational assessment*. London: The Falmer Press.
- [18]. Issitt, J. (2007). Evidence and metacognition in the new regime of truth: Figures of the autonomous learner on the walls of Plato's cave. *Journal of Philosophy of Education*, 41 (3), 381-393.
- [19]. Kelly, G. (1955). *The psychology of personal constructs*. New York: Norton.
- [20]. Klatzky, R. L. (1980). *Human memory: Structure and processes*. San Francisco: W. H. Freeman.



- [21]. Krashen, S. D. (1985). *The input hypothesis*. London: Longman.
- [22]. Lambert, R. D., & Freed, B. F. (Eds.). (1982). *The loss of language skills*. Rowley, MA.: Newbury House Publishers.
- [23]. Livingston, J. A. (2003). *Metacognition: An overview*. ERIC Document [Ed474273].
- [24]. Martini, R., & Shore, B. M. (2008). Pointing to parallels in ability-related differences in the use of metacognition in academic and psychomotor tasks. *Learning and Individual Differences*, 18 (2), 237-247.
- [25]. Obler, L. K. (1982). Neurolinguistic aspects of language loss as they pertain to second language acquisition. In R. D. Lambert and B. F. Freed, (Eds.), *The loss of language skills*. Rowley, MA.: Newbury House Publishers.
- [26]. Olshain, E. (1989). Is second language attrition the reversal of second language acquisition? *Studies in Second Language Acquisition*, 11, 151-165.
- [27]. Omaggio Hadley, A. (2003). *Teaching language in context*. Boston, Mass.: Heinle & Heinle Publishers.
- [28]. Oxford, R. (1990). *Language learning strategies: What every teacher should know*. New York: Newbury House.
- [29]. Piaget, J. (1974). *Understand to invent*. New York: Viking Press.
- [30]. Rand, S. (2005). Metacognition in science. *Science Scope*, 29 (1), 59-61.
- [31]. Resnick, L. (1989). Introduction. In L. Resnick (Ed.), *Knowing, learning and instruction: Essays in honor of R. Glaser*. New Jersey: Lawrence Erlbaum Associates.
- [33]. Resnick, L. B. , & Resnick, D. P. (1992). Assessing the thinking curriculum: New tools for educational reform. In B. Gifford and M. O'Connor (Eds.), *Changing assessment: Alternative views of aptitude, achievement and instruction*. London: Kluwer Academic Publishers.
- [34]. Rogers, C. (1983). *Freedom to learn for the eighties*. Columbus, OH.: Charles E. Miller Publishing Company.
- [35]. Skinner, B. F. (1957). *Verbal behavior*. New York: Appleton-Century-Crofts.
- [36]. Shepard, L. (1991). Psychometricians' beliefs about learning. *Educational Researcher*, 20, 7.
- [37]. Smith, F. (1975). *Comprehension and learning: A conceptual framework for teachers*. New York: Holt, Rinehart and Winston.
- [38]. Sutherland, P. (1992). *Cognitive development today: Piaget and his critics*. London: Paul Chapman.
- [39]. Tempelaar, D. T. (2006). The role of metacognition in business education. *Industry and Higher Education*, 20 (5), 291-297.
- [40]. Vygotsky, L. S. (1978). *Mind in society*. Cambridge, Mass: MIT Press.
- [41]. Weltens, B. (1987). The attrition of foreign language skills: A literature review. *Applied linguistics*, 8, 22-38.
- [42]. Weltens, B., & Cohen, A. D. (1989). Language attrition research: An introduction. *Studies in Second Language Acquisition*, 11, 127-133.
- [43]. Williams, M., & Burden, R. L. (1997). *Psychology for language teachers*. Cambridge: Cambridge University Press.
- [44]. Wittrock, M. C. (Ed.). (1986). *Handbook of research on teaching*. New York: Wiley.

---

#### ABOUT THE AUTHOR

\* English Department, College of Humanities, University of Zanjan, Iran.

Mohammad Ali Salmani-Nodoushan (salmani.nodoushan@yahoo.com) is an Assistant Professor of TEFL at the English Department of University of Zanjan, Iran. His research interests include language testing in general, and testing English for Specific Purposes, Computer Adaptive Testing, and Performance Assessment in particular. He is currently a member of the Editorial board of *The Asian EFL Journal*, *The Linguistics Journal* and *i-manager's Journal of Educational Technology*.

