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Subject : Learning Strategies / M.A. Studies

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Cognitive strategies

1. Cognitive strategies

Cognitive strategies in learning are methods or approaches that individuals use to actively process and manipulate information in order to enhance their learning and understanding. These strategies involve conscious mental processes and are aimed at improving comprehension, retention, and application of knowledge. Here are some definitions of cognitive strategies in learning:

1.According to the National Research Council (2000), cognitive strategies are "actions taken by learners to regulate their own learning processes actively, such as organizing and planning, monitoring comprehension, and evaluating learning outcomes ".

2.Oxford Dictionary of Education defines cognitive strategies as "techniques or procedures used by learners to facilitate the acquisition, storage, retrieval, and application of information ".

3.Mayer and Wittrock (2006) describe cognitive strategies as "mental processes that learners use to control their own learning, including selecting what to learn, organizing and transforming information, and monitoring their learning progress ".

4.Pressley and Woloshyn (1995) define cognitive strategies as "actions that learners take to enhance their learning and memory, such as summarizing, highlighting, self-questioning, and organizing information ".

5.Weinstein and Mayer (1986) describe cognitive strategies as "strategies that learners use to actively process information, such as elaborating on new information, organizing it into meaningful chunks, and connecting new information to prior knowledge ".

These definitions highlight the active and intentional nature of cognitive strategies, as well as their focus on processes such as organization, monitoring, and self-regulation. Cognitive strategies involve learners' conscious efforts to optimize their learning experience and promote effective understanding and retention of information. It's important to note that different researchers and educational theorists may provide slightly varying definitions and categorizations of cognitive strategies. Nonetheless, the underlying concept remains consistent – cognitive strategies are deliberate mental processes employed by learners to enhance their learning outcomes.

Cognition is a word that comes from the Latin term cognitĭo,-ōnis (knowledge) and Longman Concise English Dictionary (1985) defines it as “the act or process of knowing that involves the processing of information and includes perception, awareness and judgment” (p. 267). Knowing is the human potential of understanding a certain reality and of establishing relations through mental processes and abilities whose individual product is knowledge. Consequently, cognition refers to the mental processes and abilities involved in the processing and validation of information (such as perception, memory, imagination, intelligence and reasoning, among

others), which are not emotional or affective Humans have a cognitive system that allows them to constantly process information while interacting with the environment. No matter the activity they undertake, there will be a flow of information that could cause the development of skills and attitudes and/or the building of knowledge schemes. In fact, as Grenfell and Harris (1999) stated: “Knowledge in this sense is information to be processed” (p. 42)Language is not an ability that can be thought of as independent from other areas of human cognitive abilities, since the principles that characterize language could be used to explain the nature of any other cognitive ability of human beings, such as conceptualization, reasoning, problem solving, and decision making, among others. This hypothesis is valid because of two main reasons. First, because general cognitive principles describe the domain-general learning. Second, although it is true that some areas predominate in the determination of certain activities or processes, the central nervous system does not operate with self-contained or isolated modules, but in a distributive and interrelated way in the brain (Herrera Jiménez, 2007; Hopper, 2015))Thus, L2 learning would be a macro-process based on the general principles of cognition, for which theories of information processing applied to contextualized data are still valid. Furthermore, it is an integration of diverse processes through which knowledge is built and skills and attitudes are developed. All of these three factors are equally necessary to expand the communicative competence. The learning processes imply flows of information through the cognitive system. This is the main reason why it is useful to understand how they occur and what elements that take part in them. From an explanatory model of information processing, one can infer what the circulation of information is like, what modules operate and to what degree they do it, according to different circumstances and activities. Here lies the interest in cognitive strategies that are used to optimize the mechanisms involved in second language learning.Hymes (1966) was the first one to use the term communicative competence, described as the ability to produce statements that are not only grammatically correct but also socially appropriate. This definition was reformulated by Canale and Swain (1980) and Canale (1983a, 1983b) in an explanatory model of communicative competence that includes four competences: grammatical, sociolinguistic, discourse and strategic. On this basis, I suggest communicative competence should be considered as someone’s potential to undertake communicative activities in an effective and appropriate way, in different contexts under diverse external demands. It is accepted that external demands determine the internal structure of the competence (which is flexible and systemic) within a context, and that it is built through an integration of three main elements: knowledge, skills (cognitive and practical) and attitudes (Organisation for Economic Co-operation and Development, 2002). These components combine in four sub competences which constitute the communicative

competence model adopted in this paper: linguistic, sociolinguistic, pragmatic and strategic. The first three were adopted from Council of Europe (2002), where they were referred to as competences. I prefer to consider them as sub competences because, in in different contexts under diverse external demands, communicative activities cannot be executed in an effective and appropriate way without involving all of them. The functional structure of the strategic sub competence that I suggest would be organized as follows. A meta strategic control is constituted by meta knowledge conceptualized by Flavell (1979) plus a regulation system. The latter is in charge of the selection, planning, evaluation and adjustment of cognitive, affective, and communicative strategies to have an impact on language use and learning. As Di Carlo (2016) stated, strategies are those actions defined by their efficiency and efficacy. Metaknowledge includes several types of knowledge (Oxford, 2013): personal knowledge, task knowledge, whole-process knowledge, and strategy knowledge.According to Ellis, "Cognitive strategies are those that are involved in the analysis, synthesis, or transformation of learning materials" (Ellis, 1997, p. 77). O'Malley and Chamot (1990) stated that this type of strategies works directly in the input information manipulating it in various ways to improve knowledge, for instance, practice, organization, inference, synthesis, deduction, use of visual images, transference and elaboration. Dörnyei (2005) considered the contributions made by Oxford (1990) and by O'Malley and Chamot (1990), and stated that cognitive strategies are those which imply the manipulation and transformation of the learning materials/input. Oxford's classification (1990) faced criticism due to the dissociation between memory and cognitive strategies, since memory also implies cognitive processing. This led her to include the memory strategies within the cognitive strategies and after successive reformulations, Oxford conceived cognitive strategies as those that "aid the learner in putting together, consolidating, elaborating, and transforming knowledge of the language and culture" (Oxford, 2013, p. 46)Having considered these contributions, my definition for language learning cognitive strategies is the following: Cognitive strategies are those actions that learners adopt in a conscious (or potentially conscious), relatively controlled and intentional manner, to optimize assimilation, internalization, construction, consolidation and transference of knowledge and language skills. They are represented by the cognitive pillars underlying the three dimensions of information processing: encoding, storage and retrieval. To establish an appropriate classification, it is necessary to know what processes take place in these three stages. My proposal is to build a functional model that can illustrate these processes, the elements involved, and the relationships among them and to get closer to a description of how the processing operates. In order to continue, it is necessary to review briefly the general principles of information processing.

2. General principles about information processing

The cognitive approach in psychology was developed with the intention of finding answers to the limitations of the behavioral approach, in which the cognitive processes were not relevant and were considered only as black boxes responding to stimulus. The interest of the cognitive approach lies precisely in the psychological processes taking place within the mind. One aspect of the cognitive psychology focused on those processes involved in learning. At the same time, significant progress was made in the fields of computer studies and technology. This allowed the emergence of the information processing perspective, which beyond being a unified theory, could be considered as a combination of theories, concepts and theoretical models. Three main theoretical principles underlie this approach.The first one refers to the analogy between computers and humans, which resemble in the way they process information. The basic operations are similar, almost the same ones for both systems: decoding, coding and encoding. Decoding implies entering input and the initial transformation of data. In humans, this stage is carried out by the sensory receptors and it is operated by nerve impulses, while computers operate with digital units (bits) and the peripherals are in charge of the reception. Coding refers to the processing itself. In humans, the processing is carried out by millions of neurons and nerve fibers, while in computers this is done by a microprocessor with millions of electronic micro components. Encoding has to do with responses. While in humans responses are generated by effectors (locomotor system, articulatory system, etc.), in machines, other peripherals (monitors, speakers, printers, etc.) are the ones in charge of these responses.The second principle refers to cognitive limitations. There is a general agreement on the idea that the system of human processing has certain limitations which can be, at least, of two types (Villar, 2003): (1) the number of units to be processed is limited and (2) every cognitive activity needs resources that are also limited.The third principle refers to reductionism and modularity. Every cognitive activity, complex as it may be, is susceptible to being decomposed and reduced to a limited number of processes, components and sequences that constitute an explanatory model. Decomposing any cognitive process or activity brings the possibility of analyzing each one of the parts involved in detail. Even though these models do not exactly replicate the originals, they do represent them and they allow for tests, adjustments and research that contribute significantly to scientific knowledge

Cognitive strategies are very useful tools in supporting the learners with learning problems. The strategies for cognitive development are used to resolve a difficulty or complete a mission by means of cognition or mind. The strategies supply a configuration for learning when a task cannot be concluded through a sequence of steps. Attention to the steps results in booming achievement of the problem. Speaking in a second language is a

complex task and it is a good example of a task that does not follow a series of steps. A cognitive strategy serves to support the learners to develop the domestic procedures that facilitate to execute tasks that are complicated. Speaking in a second language is a part where cognitive strategies are important. A self- questioning strategy can lend a hand to the students realize what they speak. The act of making interrogation does not guide openly to speaking skills. Instead, students investigate various sources and merge information as generated ways to achieve the level of the native speakers in speaking. The cognitive strategies are used in the classroom where the teacher performs a key role and unite the gap between students and the skill to be learned. Content enrichment and content evaluation are the two important cognitive strategy tasks performed by the teachers in the classroom. The teacher may determine the necessary approaches to learning for the success of the students and also assess the substance. Teachers instruct with habitual manner and instructional aides that give a hand to students as they apply appropriate techniques and strategies .In this way, the teacher emphasizes what the students should learn, or the outcome of learning. In addition, the teacher shows a model that how the learning process happens in the classroom. When a teacher is skilled with the content which is trained in the classroom, the teacher knows which parts are the important, the interesting and the easiest to learn. The teacher evaluates the content with various aspects which are necessary for the learners‟ enhancement of the skills.The teacher's consideration moves to the knowledge of the students. The uniqueness like logical ability, curiosity in the subject, and inspiration to learning process of the students are to be taken into account. The teacher selects learning approaches that complement the learner‟s ability while ensuring execution with the content. Teachers who interlink learner and task while teaching cognitive strategies well in the classroom. The teacher may master in the strategies applied to the learners and explicit instructions to impart the components of the strategy. These activities have been repeated and rehearsed when it is implemented in the classroom. There are diverse tasks to use of cognitive strategies by teachers. The teachers expect an important impact on the learning process of the learners that are highly relevant to the cognitive development.