

## NEUROSCIENCE, METACOGNITION AND LANGUAGE TEACHING

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**ABSTRACT**

Metacognition, or 'knowledge and cognition about cognitive phenomena' is our human ability to think about the way we think and learn. By engaging in metacognition, human beings can actively manage and regulate what we do before, during and after the process or action. Although metacognitive awareness is a hidden psychological construct, it manifests itself in three ways, i.e. (i) metacognitive knowledge, (ii) metacognitive experience, and (iii) strategy use. Metacognitive knowledge includes person's knowledge, task knowledge as well as strategy knowledge. Strategy use includes language learning and language use. Metacognitive knowledge is an indicative knowledge about how one is thinking and learning can be positively or negatively influenced by internal factors such as personality traits, background strategic processes, as well as external factors such as the nature and demand of learning and communication tasks. This article focusses on how neuroscientific developments can inform teaching practice.

**KEYWORDS:** Neuroscience, Language Teaching, Metacognition, Awareness, Personality Traits.**INTRODUCTION**

It is indispensable to point out that facilitators' intuition about what works best in the classroom can sometimes be wrong and misguided, and neuroscientific research findings can help by challenging commonly held, but incorrect, beliefs about the brain and learning, frequently described as neuromyths. Two examples of these that have impacted teaching practice are the idea that learners are left or right brain dominant or that accepting students' learning preferences, i.e., visual, kinaesthetic, auditory will improve their learning. Research shows that both hemispheres of the brain, i.e., left, and right are used for processing both creative and logical tasks and that there is no evidence that some people have better connected, or more dominant, left or right brain networks. Neuroscience explains us that however different areas of the brain process various types of information., our brains are so interconnected that it is simply untrue what we only process information using one sensory modality.

**Application of the Metacognitive Framework**

A thought about one's own thinking is referred to as "metacognition." Understanding the goals of the learning process, picking the best learning strategies, and assessing whether the goals are being met are all required for metacognition. To put it another way, it describes the methods used to arrange, monitor, and assess a person's

performance and knowledge. It includes having a critical awareness of one's ideas and knowledge. Students who engage in metacognition are better able to discriminate between a subject's surface understanding and in-depth comprehension. On the other hand, weaker students do not have this metacognitive recognition which leads to distress and occasionally can discourage them from trying firmer the next time.

We can help learners develop listening and speaking abilities through metacognitive instruction, a process-oriented approach that develops greater metacognitive awareness and better control of skills and strategies for listening and speaking. It brings cognitive, metacognitive, affective, and social learning processes to a conscious level so that language learners can become better at self-appraising and self-regulating their learning. It is the duty of the facilitator to provide insights into the students' individual learning needs, preferences and goals, and through this improve their motivation and learning. Practice activities should be provided so that students can talk freely and can become more fluent. An approach that focusses on process rather than outcomes weaves metacognitive awareness raising and strategy learning tasks with skills practice. The metacognitive framework can help teachers select the component of metacognition to focus on when planning lessons and out-of-class practice activities, such as conversation practice and extensive listening.

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Metacognition enables one to quality-control one's thinking and reasoning and then redirect one's cognition and behaviour to improve one's chances of successfully achieving one's goals. It serves to increase the efficiency of cross-cultural relationships and is closely tied to the idea of mindfulness. It produces trusts about actions that mark our behaviour. Through reflection and our and others' attempts to justify our behaviour, we develop assumptions about the nature of action and the optimal way to make judgements. Both metacognition and intelligence perform a role in shaping or envisaging academic performance.

Several instances of metacognition are: cognizance that one has trouble retaining names of persons in social circumstances; reminding oneself that one should attempt to think of the name of a new acquaintance; realising that one knows an answer to a question but simply can't recall at the moment.

### Neuroscience and teaching

Neuroscience can provide us evidence-based ideas about useful teaching strategies. The importance of past knowledge is well established, but neuroscientific research and developments are starting to explain why. Some neuroscientists investigate what materialises in the brain when students are learning new information related to their field of study and what transpires when they learn new unrelated information. Researchers have found a part of brain that seems to be more highly activated when learners are making connections between something they already know and new information. Van Kesteren notes that this has tremendous potential utility for teaching in allowing us to target and achieve prior knowledge more effectively. Research also confirms that translation which successfully use previous first language knowledge, can be enormously effective way of helping learners learn and retain vocabulary. Neuroscience substantiates what we already do. As discussed above there is nothing new about previous knowledge, it is something that we have been exploiting in language teaching for some time, although perhaps we were not completely clear about and convinced of its importance. Strategies that utilise prior knowledge are the use of pre-tasks before introducing a text, or the use of formal and informal diagnostic tests to find out what students already know about a language point.

Future educators can better manage their learners' behaviour with the help of neuroscientific understanding of how students learn. Stress can occasionally be a factor in why students behave badly. Neuroscientists have investigated how stress affects the brain, and their discoveries can assist teachers in better comprehending the behaviour of their students.

Developmental neuroscience is defined as how the brain forms, grows, and changes. It concerns the mechanisms

by which the brain generates and controls memory, cognition, language, and problem-solving. The study of genes, proteins, and other substances that control how neurons operate is done in molecular and cellular neuroscience. Teacher neuroanatomy, instructor brain state, connection, regulation, and regulation are the four pillars of applied educational neuroscience. Neuroanatomy studies the structure of the nervous system. All nervous system consists of similar elements, the nerve cells, or neurons. The thinking of how our brain development changes during the early school years is increasing vastly. The children of today's generation are the first to grow up in a time when instruments such as magnetic resonance imaging and wearable brain-wave sensors are widely available. At the same time, joint, open-science practices such as data sharing are becoming the norm. This has increased our fundamental knowledge about the developing brain circuits of math, reading, and attention as well as permitting sampling of large populations of school children that covers the range of neurodiversity in them. Understanding how the brain processes information and the relationships between facts may be useful for educators, especially when using concept maps to visually depict ideas. the brain's natural state of operation, during which task-related behaviour may pause processing. Brain areas engaged in self-referential processing, or thought about itself or how others relate to you, are believed to be part of this default network. For two reasons, such a network is crucial to consider when it comes to learning. First, the ubiquitous occurrence of mind wandering has been linked to activation of the default network, which can reduce the effectiveness of work performance and learning. However, the primary network has also been linked to beneficial tasks like planning and creating personal goals. This phenomenon has been shown to be useful for setting autobiographical goals.

According to Professor Andre Fenton, Professor of Neuroscience at York University, "Any educator will tell you that the goal of education is far more than simply remembering what we learned in school.

"With the correct mental training, we can also employ 'learn to learn,' which increases our capacity for adaptation, mindfulness, and intelligence rather than just storing material to recall later."

### CONCLUSION

In instructional models, metacognition is the predominant process that directs learners' attention to cognitive and social processes that listeners/speakers engage in, as well as grammatical features and vocabulary items that can address the demands of a specific task. A process-oriented approach can develop skilful and strategic second language listeners

and speakers, and it can yield good results over time. It has been observed that teachers do not need and do not read research, but this is not to say that they are not interested. Learning is, by definition, about the brain and therefore, it is logical that research and evidence about brain science is germane to learning. The ability to "learn to learn" is made possible by cognitive training, which trains people to concentrate on what matters while disregarding distractions. There are number of research papers and articles that offer teachers evidence-based teaching strategies that have been shown to be effective through research. I strongly recommend research practice should start from first year of the course so that the student gradually learns the application of research. This approach is validated by the National Education Policy (NEP)- 2020.

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