


Cultivating metacognitive awareness in students - What is our role as Physiology educators?

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The twenty-first century, has brought challenges for the learners as well as the teachers in terms of the enormous increase in volume of information and the explosion of technological tools. Students suffer from cognitive overload, which is associated with incidence of depression or burnout amongst students at various levels of the training phase, eventually leading to lack of confidence and subsequently poor performance. As an educator, I always felt that effective strategies for smart learning were necessary to be informed to the learners to make them aware of the importance of learning and retrieval at an appropriate time. One such strategy is educating individuals metacognitively, where the students will be able to build strong content knowledge by responding to varying demands of disciplines by critically synthesizing different resources and valuing sound evidence. But the question always remains as to how we do it. This article intends to highlight how, as physiology educators, we can help our students enhance their performance.

What is metacognition, and why do we need to know about it?

Metacognition, the ability to reflect upon and regulate one's thinking processes, is a fundamental aspect of medical or other health professions expertise. It encompasses self-assessment, strategic planning, monitoring of comprehension, and the ability to adjust learning strategies accordingly. In a field as complex and dynamic as health professions, where diagnostic accuracy and treatment efficacy hinge on the practitioner's cognitive prowess, metacognitive skills are paramount.

The 21st-century teaching stage has seen an overwhelming exponential rise in the content and technological advancement in medicine and other professions associated with health sciences. Physiology is a subject that is taught as a basic science, providing students with a solid foundation in understanding the physiological principles underlying health and disease. By leveraging their expertise, physiologists can be pivotal in nurturing metacognitive awareness among aspiring physicians.

In the ever-changing field of education, increasing emphasis is placed on raising students' understanding of their thoughts and learning processes. This awareness, called metacognition, helps students take charge of their education by developing self-control, critical thinking, and problem-solving abilities. Because they are experts in human physiology and brain function, physiologists have played a significant role in pushing education to prioritize development. Physiologists

can greatly improve students' metacognitive skills by incorporating their knowledge into frameworks, resulting in resilient and successful learners.

How can Physiologists help?

Physiologists have strategies to assist pupils in becoming more conscious of metacognition.

Experts in physiology can instruct students on the anatomy and physiology of the brain, highlighting the many roles that distinct brain areas play in various tasks. Through an understanding of the processes of the brain, students can get insights into the processing of information and begin to cultivate awareness.

Recent studies have emphasised the importance of understanding brain functioning about metacognition. Research indicates, for example, that youngsters who are taught about the plasticity of the brain are more likely to develop a growth mindset to cultivate skills. By assisting students in realizing that their abilities may grow with commitment and effort, this understanding fosters a climate conducive to using techniques.

Physiology educators can work with education specialists and implement strategy-focused training courses. Physiologists can help build a curriculum that educates students on organizing, monitoring, and assessing their learning techniques by drawing on their knowledge of processes. Research on cognitive neuroscience suggests that practicing tactics improves metacognitive abilities. There have been studies that demonstrate that teaching students how to set objectives, ask themselves questions, and reflect on their learning process can enhance their performance and increase their awareness of their thought processes.

Physiologists specialize in understanding how stress affects clarity regarding load and stress management. They shed light on how stress and cognitive load impact learning and metacognitive processes. By teaching students about the physiological impacts of stress and coping mechanisms, physiologists can support students in maintaining function. Physiologists can emphasize how crucial stress management is to learning. Stress can impair attention, memory recall, and executive function – all essential components for metacognition. Physiologists can help students develop stress-reduction strategies, such as mindfulness exercises and relaxation techniques, to improve their abilities. In terms of self-control and biofeedback, physiologists can help students become more conscious of metacognition and learn to control their reactions using biofeedback techniques.

Biofeedback is the process of analyzing signals like heart rate, breathing patterns, and brainwaves to provide people feedback. Extensive research has indicated that biofeedback has the potential to improve metacognitive awareness and self-regulation abilities. For instance, students who use biofeedback to control their responses have demonstrated the ability to focus and manage stress, two essential skills for successful metacognitive control and eventual success in the learning process.

Through seminars and training sessions, specialists in physiology can help students and educators integrate strategies into their teaching that will improve students' comprehension of how their minds work. Science and health classes, for instance, might study biofeedback, stress reduction, and the anatomy and physiology of the brain. Teachers can assist students in becoming more conscious of metacognition as they advance in their education by incorporating these ideas into the curriculum. Furthermore, learning experiences *via* educational apps combining biofeedback stress management techniques and cognitive training are another way technology can foster progress.

Physiologists contribute to making sure these technologies have a scientific foundation.

Acknowledging the role physiologists play in helping students develop metacognitive awareness is crucial. Their knowledge helps students acquire new abilities and insight into body and brain function. Teachers who embrace the insights physiologists offer can help students realize their full potential and create a brighter future for themselves. Examining the connections between physiology and education offers chances to improve student development. These changes point to a change in emphasis toward recognizing successes. Physiologists can improve students' productivity, self-awareness, and self-regulation by incorporating knowledge into teaching strategies.

Building metacognitive awareness in today's changing environment is crucial to preparing pupils for the complexity of the modern world. Physiologists may substantially impact changing how students learn and how teachers teach to succeed through interdisciplinary collaboration, professional development, innovative curricula, and technological integration.