**Selective Course**: **MEDICAL STUDENT AND LIFELONG LEARNING**

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**Course content**

* Learning
* Metacognition
* Adult Learning
* Lifelong learning
* Medical student and lifelong learning as a physician

**Lecture notes**

**What is learning?**

Learning defines as a changing process which evolves as a result of the trainee's experience and their communication with others (Driscoll, 2005).

Learning takes place through protein chains formed by biochemical processes in the brain as a result of information repetition and experiences. This process reveals new synaptic bonds between neurons.

“A **change** in human disposition or capability that persists over a period of time and is not simply ascribable to processes of growth.”  
*— From The Conditions of Learning by Robert Gagne*

“The process of gaining knowledge and **expertise**.”  
*– From The Adult Learner by Malcolm Knowles*

*“A process that leads to****change****, which occurs as a result of****experience****and increases the potential of improved performance and future learning.”  
– From How Learning Works: Seven Research-Based Principles for Smart Teaching by Susan Ambrose, et al.*

“It has been suggested that the term learning defies precise definition because it is put to multiple uses. Learning is used to refer to

(1) the acquisition and mastery of what is already known about something,

(2) the extension and clarification of meaning of one’s experience, or

(3) an organized, intentional process of testing ideas relevant to problems.

In other words, it is used to describe a product, a process, or a function.”  
*–From Learning How to Learn: Applied Theory for Adults by R.M. Smith*

Learning is a process that:

**is active** - process of engaging and manipulating objects, experiences, and conversations in order to build mental models of the world (Dewey, 1938; Piaget, 1964; Vygotsky, 1986).

**builds on prior knowledge** - and involves enriching, building on, and changing existing understanding, where “one’s knowledge base is a scaffold that supports the construction of all future learning” (Alexander, 1996, p. 89).

**Lecture notes- Metacognition**

An important purpose of higher education is that graduates are expected to develop more advanced, academic and independent ways of learning. The demands of the twenty-first century require students to know more than content knowledge; they must know how to learn. In this context professionals in education are increasingly acknowledging the importance of metacognition for learning.

Metacognition is awareness and control of one’s learning or the knowledge and thinking about one’s own or another’s thoughts, feeling, and values. It can be classified into two main components as “knowledge of cognition” and “regulation of cognition”.

* “Knowledge of cognition” refers to what individuals know about their own cognition or about cognition in general. It includes three different kinds of metacognitive awareness: declarative, procedural, and conditional knowledge.
* “Regulation of cognition” refers to a set of essential skills that help students control their learning. Essential skills included are planning, monitoring, and evaluation.

These two components of metacognition are related to one another and both components appear to span a wide variety of subject areas and domains – that is, they are domain-general in nature (Schraw, 1998).

Consequently metacognitive skills include taking conscious control of learning, planning, monitoring the progress of learning, identify personal strengths and weaknesses, and undertake appropriate remediation. Besides selecting strategies, analyzing the effectiveness of learning strategies, and changing learning behaviors and strategies when necessary (Dunlap, 2005; Turan, Demirel, & Sayek, 2009).

According to the previous research results, students who use metacognitive strategies are more academically successful than students who do not use these strategies. Moreover, students can be taught to improve metacognitive proficiency through repeated guided practice (Schellenberg, Negishi, & Eggen, 2011; Schraw, 1998). Teaching approaches using strategies which emphasise student metacognitive and self-regulated learning is among the most effective approaches (Zohara & Barzilaib, 2013).

Metacognition is a concept that attempts to capture the essence of adapting to change and uncertainty. Medical students must be prepared to cope with the uncertainty and evolving understanding inherent in medical practice. In medicine, metacognition can also be defined as checking the diagnostic thinking for possible bias, seeing the illness from patient’s perspective, or assessing what you need to know about a treatment option (Quirk, 2006).

Metacognition helps the student to learn in‑depth, remember the knowledge easily and to choose and use accurate strategies, in addition to realizing his/her strengths and weaknesses.

**Adult Learning**

**Characteristics of Adult Learners**

**•** Adults learn what they consider is important

**•** Adults tend to be self-directing

**•** Adults have a rich reservoir of experience that serves as a resource for learning

**•** Adults prefer task- or problem-centered orientation to learning as opposed to a subject-matter orientation

• Adults are generally motivated to learn due to intrinsic factors

• Adults like to be treated as adults and will demand so

• Adults generally want immediate applications of new information or skills to current problems or situations

• Adults want to determine not only what they learn but also to identify and establish their own assessment techniques

The optimal role of the adult learner in the learning situation is that of a self-directed, self-motivated manager of personal learning who collaborates as an active participant in the learning process and who takes responsibility for learning.

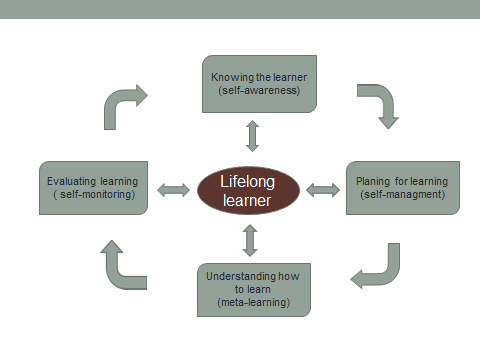
**What is Lifelong Learning?**

Lifelong education was defined as a process improving and strengthening the knowledge, values, skills and senses that individuals obtain throughout their lives and a process of putting all these into practice during the whole life cycle (Candy, 1994). It is best described as being voluntary with the purpose of achieving personal fulfillment. The means to achieve this could result in informal or formal education.

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| **Traditional Learning** | **Lifelong Learning** |
| Teacher is the source of knowledge | Teacher is a guide for sources of information. |
| Learners get the information from the teacher. | People learn by doing. |
| Learners work on their own. | People learn from each other in groups. |
| Students are not allowed to access to the next learning stage untill the range of skills are completely finished by passing the exams. | Assessment is done to guide learning strategies and to identify future learning paths. |
| All learners do the same things. | Teacher develops individualized learning plans. |
| Teachers receive an initial training first then in-service training is added. | Teacher is a lifelong learner. Initial education and continuing professional expertise are linked. |
| “Good” learners are noticed and given opportunities for further education. | People have access to lifelong learning opportunities. |

**Key checklist for lifelong learning:**

* Voluntary
* Self-motivated or self-initiated
* Doesn’t always require a cost
* Often informal
* Self-taught or instruction that is sought
* Motivation is out of personal interest or personal development



**What is self-regulated learning?**

Self-regulated learning is the modulation of affective, cognitive and behavioral processes throughout a learning experience to reach a desired level of achievement (Sitzmann & Ely, 2011). Self-regulation involves ‘cognitive, affective, motivational and behavioral components that provide the individual with the capacity to adjust his or her actions and goals to achieve the desired results in light of changing environmental conditions (Zeidner *et al*., 2000)

The concept of self-regulated learning bears some resemblance with that of metacognition.

Self-regulated learners (Zimmerman & Schunk, 2008);

* set better learning goals,
* implement more effective learning strategies,
* monitor and assess their goal progress better,
* establish a more productive environment for learning,
* seek assistance more often when it is needed,
* expend effort and persist better,
* adjust strategies better,
* set more effective new goals when present ones are completed.

**Medical Education and Metacognition**

Medical students, who are expected to be medical experts, should focus on their capabilities to continuously assess, monitor, and improve their performances(Quirk, 2006). Doctors who are metacognitively strong are self-directed learners and carry on their competency throughout their lives.

Medical students must develop the abilities to

(a) define and prioritize their goals,

(b) anticipate and assess their specific needs in relation to the goals,

(c) organize (and reorganize) their experiences to meet their needs,

(d) define their own and recognize differences in others’ perspectives, and

(e) continuously monitor their knowledge base, problem solving, and interactions with others (Quirk, 2006).