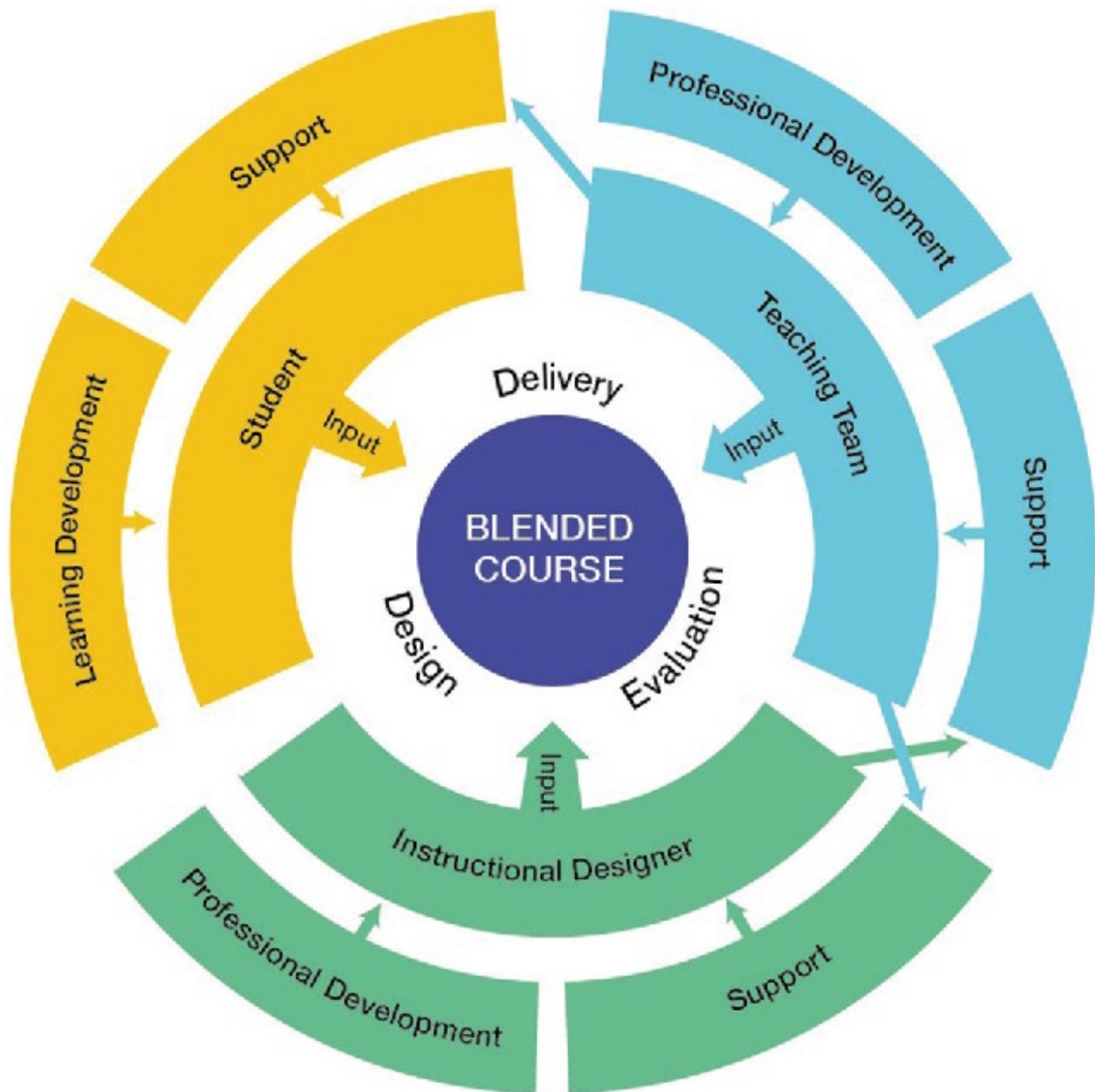


# The Biochemistry Chronicles



# Basics of medical education in teaching and assessment of Biochemistry



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In “Guidelines for competency based postgraduate training for MD in Biochemistry,” some areas have been mentioned, where students should acquire competencies at the end of their training programme. One such area is “Teaching and training.”

Post Graduate (PG) students are supposed to be able to effectively teach undergraduate students in medicine and allied health science courses. For this reason, they are supposed to acquire competencies to “Describe the principles of teaching - learning technology towards application and take interactive classroom lectures, prepare modules for Problem based learning (PBL), organize and conduct PBLs, case discussions, small group discussions, Seminars, Journal club and research presentations.” For this purpose, the topic “**Basics of medical education in teaching and assessment of Biochemistry**” have been included in syllabus of paper 1.

PG students have been found to struggle in last minute for appropriate resources to study this topic. To solve this problem, it has been decided by AMBI WB chapter to cover this whole topic in 5 different parts as mentioned below:

Part 1: Taxonomy of learning & Principles of adult learning

Part 2: Microteaching & Small group teaching, Educational Objectives

Part 3: Principles of assessment and Methods of assessing knowledge

Part 4: Question paper setting

Part 5: Appropriate use of media in teaching and learning

This month, Part 1 of the topic has been discussed.

## **Part 1: Taxonomy of learning & Principles of adult learning**

### **Taxonomy of learning**

The taxonomy is often characterized as a ladder or pyramid. Each step on the taxonomy represents a progressively more complex level of learning. The lower levels of learning serve as a base for the subsequent levels that follow.

Bloom’s taxonomy was developed by a committee of educators through a series of conferences held between 1949 to 1953. It was published in “Taxonomy of Educational Objectives: The Classification of Educational Goals” and is named after Benjamin Bloom, the educational psychologist who chaired the committee and edited the book.

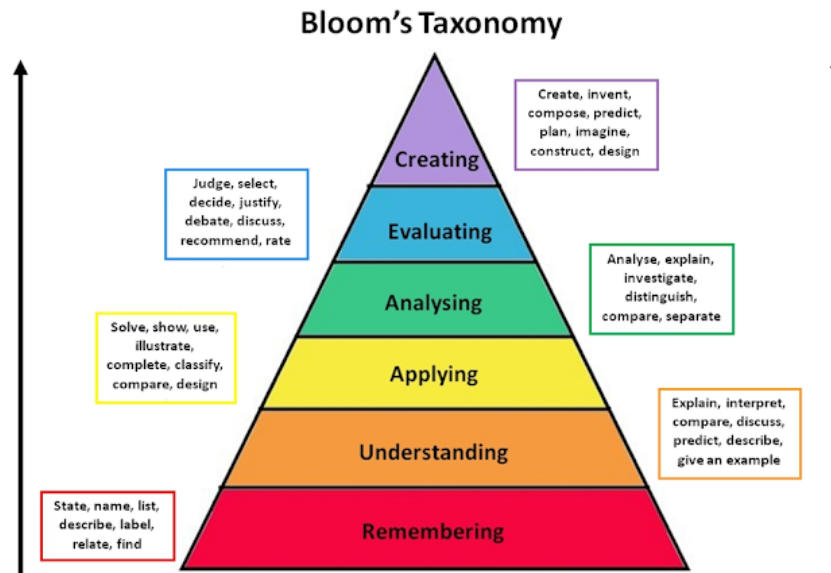
Bloom and his colleagues identified three domains of learning activities:

- Cognitive (the development of intellectual skills) – Knowledge
- Affective (feeling, motivations, etc.) – Attitude
- Psychomotor (use of motor skills and coordination) – Skills

The taxonomy is widely used today for a variety of purposes mentioned below:

- a. Develop classroom instruction and lesson plans
- b. Create instructional strategies
- c. Design and develop curricula
- d. Assess courses
- e. Identify assessment objectives
- f. Create effective written assessments
- g. Measure learning outcomes

So far Cognitive Domain is concerned, there are six levels of learning from simple to complex.



## Principles of adult learning



### Malcolm S Knowles

Adult educator, famous for the development of ideas around andragogy

In the mid-1970s, American educator Malcolm Knowles began to recognise that

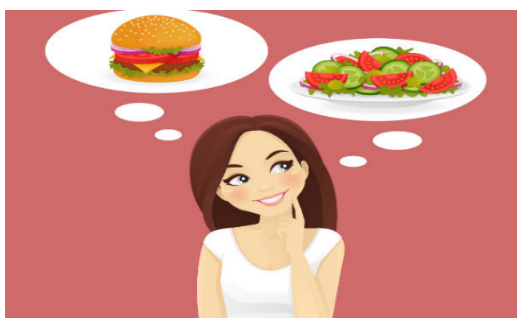
adult learning differs significantly from childhood learning. These differences are

due to adults having lived much longer lives, and therefore already have motivations and experiences that drive them. Understanding these differences means learning can be just as effective following adolescence. To describe this theory, Knowles popularised the term andragogy to refer to adult learning.

The term andragogy is derived from the Greek words andra, meaning 'man', and agogos, meaning 'leader of'. Literally translated, andragogy means 'leading man' or 'man-leading'.

The differences between Pedagogy and Andragogy are given below:

<b>Pedagogy</b>	<b>Andragogy</b>
The art and science of teaching children is known as Pedagogy	The art and science of helping adults learn is called Andragogy
Formal	Informal
Dependent on teacher	Independent
Directed by the teacher	Self-directed
One way	Interactive
Learn what is put upon them	Learn what is relevant to them
Teacher-centred method	Student-centred method



Accordingly, Knowles outlined four characteristics that define adult learning. These are:

- a. Adults should take ownership of the planning and evaluation of their learning
- b. Experience (including mistakes) provides the basis of adult learning activities
- c. Adults are most interested in subjects that have immediate relevance to their job or personal life

- d. Adult learning should be problem-centred rather than content-centred

As such, autonomy, relevance, and self-directed learning are central pillars of Knowles' theory of andragogy. Whereas childhood learning typically focuses more on the 'what' — such as learning basic facts and skills — adult learning focuses more on the 'why,' i.e. the processes and reasoning that underpin a specific learning activity.

Additionally, adult learners should be familiar with the goals and objectives of a particular learning activity beforehand and, ideally, play a role in defining these outcomes. Finally, the content should be relevant to the learners' life and prior experiences.

### **Examples Of Adult Learning:**

- a) Self-Directed Learning (SDL): It is a process in which adults themselves take the initiative, without the help of others in planning carrying out and evaluating their own learning experiences.
- b) Problem Based Learning (PBL): Learning by solving a given problem.
- c) Transformative learning (TL): Learning that changes the way individuals think about themselves and their world, and that involves a shift of consciousness.

- d) Experiential learning: It was proposed by Kolb, where actual experience and education in learning is integrated.

Adult learning principles can be considered as guidelines that can help design and deliver effective learning experiences for adults. According to the University of Phoenix, adult learning theories have expanded to include an array of options over and above the principles laid down by Malcolm Knowles. They are as follows:

1. Self-directed: Learning at one's own pace in one's own way
2. Transformational: Learning can change your perspective on the world and vice-versa
3. Experiential: Focuses on developing life experience or "hands-on" learning
4. Mentorship: Learning from an outside mentor (established figure) in a field
5. Orientation to (or of) learning: Adults need to reframe their emotions and assumptions around the experience and value of learning
6. Motivation: Adults often have internal motivation
7. Readiness to learn: Adults rely on experience or life changes to develop a renewed readiness

## Challenges of adult learning:

Some common obstacles to adult learning include:

1. Time
2. Confidence.
3. Competing against a younger, more agile workforce or student peer group can undermine any experienced professional's confidence.

## 4. Money

**"Anyone who stops learning is old — whether this happens at twenty or at eighty. Anyone who keeps on learning not only remains young but becomes constantly more valuable — regardless of physical capacity." ~ Henry Ford**

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