ScientificScholar®
Knowledge is power
Publisher of Scientific Journals

https://ijpp.com

Indian Journal of Physiology and Pharmacology

Opinion Article

The undergraduate MBBS curriculum of physiology 2019: A cognitive compromise

Arnab Sengupta[1], Damodar Prasad Goswami[2]

[1]Department of Physiology, Institute of Postgraduate Medical Education and Research, SSKM Hospital, Kolkata, West Bengal, India, [2]Department of Mathematics, Netaji Subhash Engineering College, Kolkata, West Bengal, India.

***Corresponding author:**
Arnab Sengupta,
Department of Physiology,
Institute of Postgraduate
Medical Education and
Research, SSKM Hospital,
Kolkata - 700 020,
West Bengal, India

arnabseng@gmail.com

Received : 15 February 2020
Accepted : 09 August 2020
Published : 25 January 2021

DOI
10.25259/IJPP_263_2020

Quick Response Code:

The new competency-based undergraduate curriculum (CBME) for Indian medical graduates, as promulgated by the Medical Council of India, is basically framed as an outcome-oriented protocol. This outcome-driven UG curriculum is said to be designed to provide the orientation and necessary skill for proper care of the patients. In particular, the said curriculum provides for early clinical exposure, longitudinal care, and skill acquisition. The acquisition of skill is given utmost importance as an indispensable component of the learning process in medicine, and a detailed procedure of certification in certain essential skills is being prescribed, with the provision of the establishment of skill laboratories in a simulated and guided environment.[1] In the new curriculum, the whole syllabus of UG medical physiology is listed as 137 outcomes or competencies from which the individual academic department is expected to develop specific learning objectives and detail time schedule of activities to be uploaded in the public domain of the college website.

In the present paper, we intend to analyse the relative importance given to the element of knowledge acquisition in comparison to that of the skill development in the UG teaching in physiology in the CBME under consideration.

Physiology, as a basic preclinical subject, delves into the fundamental premise of homeostasis in human health and disease. A thorough and critical understanding of the subject is not only essential to comprehend the pathophysiology of the diseases, know clinical features and therapeutic decision-making; the cognitive foundation of prospective academics in the field of medical science is also created in this phase of inculcation.

As per Bloom's Taxonomy, the domains of learning are cognitive, psychomotor and affective, which broadly signify the knowledge, skill and attitude components of learning, respectively. In the present curriculum, there is a substantial emphasis on the non-cognitive domains with the provision of the foundation course, AETCOM module, early clinical exposure and a battery of skill development components, but the cognitive domain is rather de-emphasized. In the Bloom's original Taxonomy (1956), the cognitive domain was further stratified into six levels as *knowledge-comprehension-application-analysis-synthesis-evaluation*,[2,3] whereas the revised taxonomy (2001) espouses a slightly different one with an addition: *remember-understand-apply-analyse-evaluate-create*,[4] wherein 'create' is introduced as a higher order of cognitive goal. There are lengthy discussions and critical appraisal on these research areas of educational psychology in large number of literature in India and abroad for the last several decades.[5] Without going into the details, it can be reasonably implied that intensive and extensive cognitive learning is needed to build up a strong foundation of

basic subjects at the outset of UG tenure to develop appropriate acumen for analytical and evaluation proficiency in the young enthusiastic minds. This initial preparedness will lead to the development of innovativeness and attitude for inquiry and research among the medical graduates. However, relevant research in the field of medical education in our country is surprisingly sparse that indicates that the medical educationists of India are doing little groundwork and imposing certain overseas model to fit-in.

In the current UG curriculum of MCI, the competence classification is leveled as *know-know how-show how-perform* that indicates an apparent goal of performing ability and skill acquisition of the students.[1] This is in distinction to the Bloom's Taxonomy model of cognitive levels as discussed earlier, which emphasizes the creative and innovative aspects of the learners. Thus, a relative overemphasis on the component of skill and competence than the knowledge component becomes the hallmark of the new CBME. In absence of meaningful and significant works in this area of education research, it is not really a prudent proposition. It is also well known that CBME focuses on immediate needs and is less focused on preparing learners with the flexibility needed for a more uncertain future and does not suit subject areas, where it is difficult to prescribe specific competencies or where new skills and new knowledge need to be rapidly accommodated. It also takes an objectivist approach to learning and does not suit developing a higher level, more abstract knowledge and skills requiring creativity, high-level problem-solving and decision-making and critical thinking.[6] The knowledge base learning is also essential for the clinical practice.[7]

Another area in the present curriculum where there is an apprehension of potential downslide of the cognitive component is the introduction of too much objectivity in the student evaluation system. For example, the proposition of objectively structured practical examination (OSPE) and simulated experimentation in virtual platform is said to substantially replace the conventional pattern of practical examination. Practical teaching is one form of active learning or the process of having students engage in an activity that forces them to reflect on ideas and how they are using those ideas. Knowledge is gained through a cycle of hands-on experience with reflection guided to the conceptualization and then returning to application. When complemented by self-assessment, the students' understanding and skill are further enhanced. Practical teaching is a student-focused learning, rather than a teacher-centric deliberation that leads to increased student interest, attention and knowledge retention. This facilitates better solutions to problems, increased mastery of conceptual reasoning and better retention compared to learning alone.[8,9] The practice of conducting scientific investigation even in a small set up of UG laboratory leads to the acquisition of fundamental scientific concepts and is critical in nurturing a lifelong interest in science. It also provides opportunities to develop research skills crucial in science and medicine careers, including precision, accurate measurement and the mastery of often delicate equipment. It also develops important transferable skills, such as team-work, resilience and analysis. Fundamentally, medical science is a practical discipline and, by undertaking good practical science at UG level, one gains the proper scientific temper that might help the student to adopt a science-related occupation in future.[10]

In conventional practice, the examinee has to perform and conduct the whole experimental procedure under the supervision of the examiner and draw the result and conclusion, while in OSPE setting, the whole experiment is not done during the practical examination, only a piecemeal portion of the whole experiment is made in a highly objective manner in front of an 'informed observer,' who may not always be a qualified examiner personnel. It has been observed by the seasoned examiners that, very soon after the onset of the examination the examinees come to know about the OSPE items, memorize and mechanically follow suit in a rote manner, and the desired objective of the examination is not fulfilled. As a consequence, there has been adverse and detrimental effect on the practical and experimental learning of the students, simply because the major proportion of the students intends to perform in the examination only. The students might lose interest in conducting experimental practical in regular classes. The age-old module of imparting practical teaching characterized by 'causal inference from experiment and observation'[11] is largely ignored. It is well known that a good practical lesson cannot be replaced by a virtual session.[12] As Max Plank wrote, 'Experiment is the only means of knowledge at our disposal. The rest is poetry, imagination.'

Accordingly, there exists a reasonable apprehension that the cognitive foundation of the budding medicos will be liable to be compromised in the hype of skill training, too much objectivity in assessment protocol, lack of actual experimentation and 'other distractions.'

Declaration of patient consent

Patient's consent not required as patients identity is not disclosed or compromised.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Ananthakrishnan N. Competency based undergraduate curriculum for the Indian medical graduate, the new MCI curricular document: Positives and areas of concern. Med Educ 2018;1:34.
2. Bloom BS, Engelhart MD, Furst E, Hill WH, Krathwohl DR. The classification of educational goals. In: Taxonomy of Educational Objectives: Handbook I: Cognitive Domain. New York: David McKay Company; 1956.
3. Adams NE. Bloom's taxonomy of cognitive learning objectives. J Med Libr Assoc 2015;103:152-3.
4. Anderson LW, Krathwohl DR. A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives. New York: Longman; 2001. p. 352.
5. Seel NM. Encyclopedia of the Sciences of Learning. Boston, MA: Springer; 2012.
6. Senhaji A. Advantages and Limitations of the Competency Based Curriculum. Centre Régional des Métiers de l'Education et de la Formation. Available from: http://www.moroccoenglish.com/me-md/2017/12/Advantages-and-Limitations-of-the-Competency-Based-Curriculum-2012-2013.pdf. [Last accessed on 2020 Aug 09].
7. Riddle JM. Teaching clinical skills. In: Jeffries WB, Huggett KN, editors. An Introduction to Medical Teaching. Dordrecht, Netherlands: Springer; 2010. p. 65-77.
8. Webb TP, Vetter CS, Brasel KJ. Teaching with practicals and labs. In: Jeffries WB, Huggett KN, editors. An Introduction to Medical Teaching. Dordrecht, Netherlands: Springer; 2010. p. 91-100.
9. Millar R. The Role of Practical Work in the Teaching and Learning of Science. Washington, DC: University of York, National Academy of Sciences; 2004. Available from: https://www.sites.nationalacademies.org/cs/groups/dbassesite/documents/webpage/dbasse_073330.pdf. [Last accessed on 2020 Aug 09].
10. Grant L. Practical Skills of New Undergraduates. Russell Group Survey, Laura Grant Associates for the Gatsby Charitable Foundation; 2011. Available from: http://www.gatsby.org.uk/uploads/education/reports/pdf/practical-skills-of-newundergraduates-report-on-research-workshops-laura-grantoct-2011.pdf. [Last accessed on 2020 Aug 09].
11. Zwahlen M, Salanti G. Causal inference from experiment and observation. Evid Based Ment Health 2018;21:34-8.
12. Good Practical Science Report, Gatsby Foundation. Available from: https://www.gatsby.org.uk/uploads/education/reports/pdf/good-practical-science-report.pdf. [Last accessed on 2020 Aug 09].

How to cite this article: Sengupta A, Goswami DP. The undergraduate MBBS curriculum of physiology 2019: A cognitive compromise. Indian J Physiol Pharmacol 2020;64(Suppl_1):S21-S3.