

Opinion Article

Can technology in a multipronged approach be effectively utilized in implementing a competency-based undergraduate curriculum?

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Long-awaited new MBBS curriculum titled 'Competency-based Medical Curriculum (CBME) for the Indian Medical Graduates' has been rolled out by the Medical Council of India and implemented from August 2019 across all the Medical Colleges of the country. The curriculum is designed for creating an Indian Medical Graduate with the required knowledge, skills, attitudes, values and responsiveness to function appropriately and effectively as a physician of first contact of the community while being globally relevant.^[1]

In Phase 1, the physiology curriculum has 11 topics with alignment and integration, 137 outcomes having 495 hours of teaching that includes 160 lecture hours, 310 hours of small group teaching/tutorials/integrated learning/practical, 40 hours of self-directed learning, 149 integrated competencies and 13 certifiable skills. New teaching/learning elements such as 1 month of foundation course, early clinical exposure (30 hours in physiology), alignment and integration, professional development, including Attitude, Ethics, and Communication Module (AETCOM) and Electives have been introduced.^[1] CBME focuses on greater flexibility, learner-centered approach, role of teacher as facilitator, use of well-defined outcomes, demonstration of required skills and utilization of different assessment tools with more weightage on the formative type.

To address all these teaching-learning modalities, physiology teaching faculty has many questions to ponder upon – Are we adequately trained and equipped in the backdrop of deficient faculty strength, time constraints, limited support and resources? In spite of all odds, the onus is on the medical teachers and institutions in the best interest of the students to implement CBME on par with the global standards.

CAN TECHNOLOGY ASSIST US IN THIS ENDEAVOR?

Yes. With increasing knowledge and advancement of information technology, this can play a pivotal role in assisting the faculty with varied options and freely available resources which when used appropriately and effectively can motivate and generate more interest among the tech-savvy students of the present generation.^[2] In this context, we, the faculty from the physiology department of Yenepoya Medical College, Mangalore, Karnataka, have made an attempt to successfully utilize technology in our curricular transactions. We have a robust information and communication technology (ICT) department catering to the advanced needs of faculty and students with seamless and secure access to support teaching, learning, and research. All the students are trained to use ICT facilities and are provided with laptops with Wi-Fi in the campus.

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TECHNOLOGY IN FOUNDATION COURSE

We used the Google classroom platform and enrolled 150 students with faculty as moderators. E-reflections on the sessions, movies, books, assignments, daily feedback, session feedback, YouTube links, study material and reference articles were shared. Short movies on different themes were prepared by the students which were judged by a panel of experts and prizes were distributed to the winning teams. Google doc and Google forms were used for collecting responses from the students on various questionnaires and documentation of all faculty coordinator reports. Whitecoat ceremony was conducted on the last day of the foundation course which was streamed live on social networking pages of our university.

USE OF TECHNOLOGY FOR EFFECTIVE TEACHING LEARNING EXPERIENCE

At the end of a set of competencies, crossword and image finder jigsaw puzzle activity using online smart tools are conducted for students. Students are then asked to present seminars on those topics. Similarly, students were trained and encouraged to create concept maps using free online software for an easy understanding of the concepts. An assessment and feedback collected at the end of the students are highly rewarding for the faculty which shows student satisfaction and active learning. In addition, pulse tracing, electrocardiogram, stethography, pulmonary function tests and autonomic function tests are being conducted using digitized instruments.

SIMULATION-BASED TEACHING

We have developed integrated simulation-based modules that have been validated by experts for early clinical exposure and skill development Advanced Comprehensive Clinical Training and Simulation Centre (ACTS-YEN), Yenepoya (Deemed to be University), Mangalore. Physiology competencies on the cardiovascular system, respiratory system, reproductive systems and nervous system are taught for 1st-year students using high fidelity and low fidelity simulators and task trainers.^[3] Pretest, posttest assessment and feedback are obtained online.

E-PORTAL FOR SELF-DIRECTED LEARNING

Our institution has YENGAGE, an online learning portal of Yenepoya (Deemed to be University), which is created on the ILLIAS platform, is being used for online discussion forums as part of self-directed learning where students discuss on a particular topic assigned to a designated group and faculty as a facilitator. Relevant articles, study material, web links of YouTube videos, virtual labs and online learning centres are

shared with the students. Student activities and progress are monitored periodically.

AS AN ASSESSMENT TOOL

Continuous formative assessments in the form of E-tests, E-reflections on early clinical exposure and AETCOM sessions are conducted using an online platform. About 20% of internal assessment is allotted to this part. E-portal is used for maintaining student profile, marks obtained in the seminar presentations, professionalism, behaviour, attendance, teaching schedule, unit test marks and internal assessment marks. Documentation of skill certification is also carried out with Google spreadsheets linked to the drive with student details, number of attempts, feedback provided at every stage and faculty involved with the checklists.

FOR OUTCOME ANALYSIS

An important component which needs to be addressed as a next level of CBME is to know the level of achievement of students and institution. This can be effectively addressed by adapting the model of outcome-based education. Here, the competencies are assessed with relation to the course outcomes (at the end of physiology teaching) and program outcomes (at the end of MBBS). This requires step by step systematic approach of mapping of outcomes at different levels and involves multiple assessments and feedbacks from all stakeholders.^[4] This has been addressed by us by incorporating a technology-assisted outcome-based educational framework for analysing the outcomes which are linked to the teaching-learning methods and assessment techniques. We have mapped all the competencies to course outcomes and course outcomes are mapped with program outcomes. We have now started analysing the outcomes. Examinations on tablets, E logbooks, apps to assist in certifying skills, etc., are in the process of development.

CONCLUSION

It is clear from our experience that by optimal utilization of technology as a curricular transaction tool, we could address the principles of adult learning such as active learning, being problem-centric, based on previous experience, being relevant, having emotional connection, based on self-learning and the principle of alignment.^[5] Technology can never replace the role of a teacher, but can definitely assist the faculty to make the teaching-learning experience more interesting, motivating, effective and memorable.

Implementation of CBME is a challenge for the faculty, but it is said that '*Challenges are what makes life interesting, and overcoming them is what makes them meaningful.....If it does not challenge you, it does not change you*'- Joshua J. Marine.

Strong determination, clear planning, involving all stakeholders, liaisons with likeminded individuals and strategic alignment with the institutional goals can build an ideal environment for implementing curricular reforms in any educational program.

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Declaration of patient consent

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Conflicts of interest

There are no conflicts of interest.

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