

Internal Assessment in Phase I of Medical Undergraduates as per the New Competency-based Medical Education Curriculum

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ABSTRACT

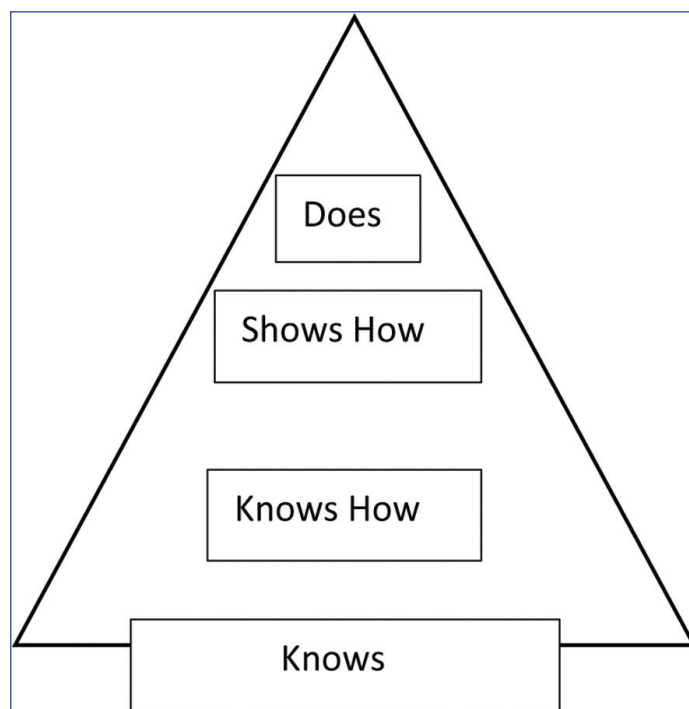
The new Competency-Based Medical Education (CBME) curriculum was introduced in August 2019. Phase-I of the CBME curriculum encompasses preclinical subjects, each with its own set of competencies to be assessed according to the new CBME guidelines. Internal Assessment (IA) serves as the foundation of the CBME curriculum and is an essential component of medical education. It is included in Module three of the CBME curriculum and aids in the assessment of various competencies. IA consists of both formative and summative assessments, and employing multiple methods can enhance its effectiveness. The incorporation of regular feedback and remedial measures is crucial within the IA framework. The purpose of present review is to provide a review of the IA in Phase I based on CBME and previous research papers.

Keywords: Formative assessment, Internal assessment, Module, Summative assessment

INTRODUCTION

The CBME is an outcome-based strategy that integrates knowledge, skills, attitude, and ethics into observable and measurable competencies. Phase I of the CBME curriculum consists of Anatomy, Physiology, Biochemistry, Introduction to Community Medicine, along with Professional and Personal Development Modules [1]. Assessment plays a crucial role in the implementation of a competency-based curriculum. The traditional form of assessment in Time-based Medical Education is largely based on the recall of factual information, for which summative assessment is conducted at the end of the professional year [2]. Competency-Based Assessment (CBA) is a continuous process conducted throughout the professional year. It includes day-to-day activities such as students' learning approaches, daily observations, their work, attitude, professionalism, and presentation in seminars. This also encompasses academic activities like research projects, essay competitions, and quizzes. Assessment can also be conducted during lectures, small group discussions, and seminars, utilising techniques such as clickers, one-minute papers, and the muddiest point, which provide valuable information to assess students' understanding. IA includes both formative (ongoing) and summative (term-end) assessments. Term-end examinations (summative assessments) are conducted by universities, while ongoing assessments (formative) are conducted by departmental faculties and should involve multiple faculty members. When designing IA, all domains of learning-cognitive, psychomotor, and affective-should be taken into account, and weightage should be assigned to these domains. Miller's pyramid, as shown in [Table/Fig-1], is helpful in selecting appropriate assessment tools for all domains [3].

George E. Miller, an American physician, proposed a comprehensive assessment system that became an influential model in the field of medical education. This assessment framework is now known as "Miller's Pyramid" [Table/Fig-1] [3]. Miller's Pyramid aids in assessing medical learners' clinical skills, competence, and performance. The framework describes four levels of assessment: "knows" (assessment of knowledge), "knows how" (assessment of competence), "shows how" (assessment of performance), and "does" (assessment of action).



[Table/Fig-1]: Miller's pyramid [3].

In the first step, knowledge is acquired through the recall of facts, theories, and principles. This can be assessed using true or false Multiple-Choice Questions (MCQs). The second step pertains to the ability to solve problems and describe procedures. Presentations and matching-type MCQs are useful for assessment. The third step is focused on performance or demonstration of learning, which can be evaluated through simulations and Objective Structured Practical Examinations (OSPE). The fourth step involves assessing how the learner performs the task in practice, which can be done through direct observation.

Nagarala M and Devi R also noted that the assessment of competency should progress from the "knows" level to the "does" level [4]. Many competencies, such as communication, teamwork, and sincerity, cannot be adequately assessed solely through

summative examinations. Therefore, all competencies should be evaluated multiple times and in different contexts as part of IA. The use of multiple methods, multiple examiners, and multiple settings to assess multiple competencies helps improve the reliability and validity of competency assessment. Expert subjective judgment also plays a significant role in assessing competencies [5].

Scheduling of Internal Assessment (IA):

A proposed schedule of tests for IA is presented in [Table/Fig-2], as per of the National Medical Commission (NMC) manual [3].

Phase	Minimum number of tests during the year	Remarks
1 st	Human Anatomy: 3 Physiology: 3 Biochemistry: 3	One of the 3 tests in preclinical subjects should be preliminary or preuniversity examination
	Community medicine: 1	Also to be assessed in Phase I

[Table/Fig-2]: Suggested plan of tests for Internal Assessment (IA) for Phase 1.

The table provides the minimum required number of tests, but additional tests can be scheduled as needed. Departments can conduct additional tests prior to the university examination. A student who has not taken the minimum required number of tests for IA in theory and practical will not be eligible for the university examination. If a student's final IA in a particular subject falls below the required level, they may be given one opportunity to improve. This test should be conducted at least two weeks after the previous test. For subjects like community medicine that are taught in multiple phases, proportional weightage must be given to IA for each phase, contributing proportionally to the final IA [3,5].

I. Components of Internal Assessment (IA):

- Theory IA:** Primarily used to assess the knowledge domain. Marks from part completion tests and terminal examinations should be added to the final formative assessment. Continuous IA should include home assignments, seminars, class tests, and self-directed learning activities such as museum study and library assessments.
 - Long Answer Questions (LAQ): Presented as clinical/practical problems, avoiding one-liners and simple recall-based questions. The question stem should be structured, and marking distribution should be provided for all sections of LAQ.
 - Short notes: Questions should be task-oriented rather than simply asking for a short note on a topic.
 - Reasoning questions: Helpful for assessing integration, reasoning, and analytical ability of students.
 - Short notes Attitude Ethics and Communication (AETCOM): Professional and attitudinal skills can be assessed in the theory examination of each subject. In Phase I subjects, AETCOM questions should primarily be knowledge-based.
 - Multiple Choice Questions (MCQs): Scenario-based questions, avoiding one-liners, negative terms in the question stem, and options such as 'All of the above' and 'None of the above' [3].
- Practical IA:** Based on the psychomotor and affective domains. Assessment of record books or practical files should contribute to IA. Skills competencies acquired during the professional development program (AETCOM) must be tested during practical assessments.
 - Assessment of logbook: The logbook should record all activities such as seminars, symposiums, quizzes, and other academic activities. It should include records of certifiable skill-based competencies (sports, exercise, pandemic modules, simulation-based learning, family adoption program), AETCOM competencies, and laboratory

activities. The logbook should be assessed regularly and submitted to the department, with a weightage of up to 20% [3,6].

- IA for professional development program (AETCOM): The professional development program, which includes attitude, ethics, and communication (AETCOM), is a new teaching-learning element in the curriculum. Soft skills, behaviour, communication, respect for cadavers, and ethics are taught in the classroom, similar to other Phase I subjects. The AETCOM module is mainly assessed in the IA [3,6,7].

Assessment of Early Clinical Exposure (ECE) and Foundation Course; It should be included in the first phase:

The ECE has been introduced into the first year of the undergraduate teaching program to provide clinical relevance to basic sciences. It allows medical students to be exposed to patients as early as the first year, either through classroom, hospital, or community settings. A one-month foundation course, conducted right after admission to a medical college, helps orient first-year students to the Bachelor of Medicine and Bachelor of Surgery (MBBS) program. The time dedicated to the foundation course cannot be used for any other curricular activity [3,7].

Feedback: Feedback helps students improve their performance, and remedial actions can be initiated in a timely manner. The university should guide colleges in formulating policies for remedial measures for students who either fail to score qualifying marks or have missed some assessments due to any reason. At times, secondary stakeholders such as parents, foster parents, or administrators may also be involved. Remedial measures should be specific and targeted towards addressing deficiencies [3,5].

Record keeping: Proper records of IA should be maintained, which can be in either manual or electronic form. The key features of the record should be regularity, availability to students, and documentation of discussions on the results (current status, feedback, and suggestions for improvement). It is recommended that students sign with the date whenever they are shown IA records. This helps document that the records have been shown and discussions have taken place with faculty members on how to further improve. The results of IA should be displayed within two weeks of the test. IA marks will not be added to the university examination marks and will be reflected as a separate passing grade in the summative examination [3].

Eligibility for appearing in the university examination as per IA [3,8]:

- Regular periodic exams to be conducted throughout the course, as mentioned in [Annexure I].
- Maintenance of a logbook.
- Students must secure at least 50% of the total marks (combined theory and practical) and 40% marks in theory and practical separately for IA.

Summative assessment logistics (for universities) are shown in [Table/Fig-3] [8,9].

- Internal Assessment marks will not be added to the university examination marks and will be shown separately in the grade card [3].

Phase of course	Total marks of theory	Practicals	Pass criteria
First Professional			40% marks in aggregate, in both papers
Human anatomy- 2 papers	200	100	
Physiology- 2 papers	200	100	
Biochemistry- 2 papers	200	100	

[Table/Fig-3]: Summative assessment.

- Criteria to pass in a subject:
- A candidate must obtain 50% marks in aggregate.
- In the university conducted examinations, a minimum of 60:40 or 40:60 split between theory and practical (including practical and viva-voice) is required to pass the examination
- No grace marks will be considered for passing in an examination [8].

Examination schedule for Phase I is shown in [Table/Fig-4].

The examination schedule for Phase I is as follows [Table/Fig-4]: According to recent changes in the CBME Curriculum Guidelines [9]:

- The first professional phase lasts for 12 months, including a one-week foundation course. The remaining duration is spread over six months at the discretion of the college.
- Supplementary examinations and declaration of results will be processed within three to six weeks from the date of the main examination results.
- Students are allowed four attempts to clear the first professional university examination.
- Partial attendance at the university examination is counted as an attempt [3,6,8].

Jan	Feb	March	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
								I MBBS			
I MBBS								Exam I MBBS			

[Table/Fig-4]: Examination schedule of Phase I.

Jan: January; Feb: February; Aug: August; Sept: September; Oct: October; Nov: November; Dec: December

DISCUSSION

The IA plays a pivotal role in the medical education curriculum as it provides opportunities to assess skills and competencies that cannot be evaluated through traditional examinations. The involvement of multiple faculty and the use of multiple assessment tools are important in this process. The significance of assessment tools has also been emphasised in a study by Shrivastava S and Shrivastava P [10]. There is a positive linear relationship between IA and university marks, indicating that students who perform well in formative assessments throughout the year are likely to score well in summative assessments. The same is true for the converse relationship with IA marks. Badyal DK et al., also supported this linear relationship by comparing IA marks with university marks of students and defined the validity and predictive utility of IA [11]. The theory question paper for university examinations should include a combination of various types of questions, such as LAQs, SAQs, and MCQs. Marks for each part of the question paper should be indicated separately, and MCQs should not account for more than 20% of the total weightage [3]. Patil SY et al., suggested in their study that there should be an appropriate distribution of questions across topics for IA [12].

However, there is enough evidence in the literature to suggest that subjective assessments can be as reliable as highly objective ones. Singh T highlighted the issues related to objective assessment in their study. Objectivity is more reliable for selection tests, but subjective expert judgments are more appropriate for the formative purposes of IA in medical education. Most objective tests of knowledge make use of well-structured problems, which is in contrast to real-life scenarios where most problems are poorly structured. Therefore, soft learning skills that are useful in real-life scenarios cannot be objectively assessed [13]. The Norcini J and Vaneesa B study also emphasised the importance of soft learning skills in real-life scenarios [14]. IA can help medical faculty provide remedial actions, feedback, and guide learning. Badyal DK and Singh T suggested in their study on IA for medical graduates in India that the proper use of IA can address the learning needs of students at an early stage [5].

Another study by Badyal DK et al., highlighted the impact of immediate feedback in IA. They concluded that immediate feedback helps students learn better and provides valuable inputs to both students and teachers regarding the adequacy of teaching and learning [15]. Jain V et al., also emphasised the importance of immediate feedback and encouraged the use of formative assessment as an educational tool [16]. Some authors have emphasised the need for orientation and faculty training in IA as part of the CBME approach [4,5,17]. Badyal DK and Sharma M suggested the importance of faculty training in assessment and highlighted the significance of logistics in IA within the new MBBS curriculum. Faculty training prepares instructors to make informed decisions and use appropriate tools for IA [18].

Lack of awareness among faculty is also a contributing factor, which is why capacity building through a series of faculty development programs can help ensure the proper implementation of IA. Most of the literature available on IA is based on time-based medical education, as the CBME approach was implemented from 2019 onwards. After the implementation of CBME, many articles have been published on CBME guidelines, with IA being a part of it. Articles published on IA after the introduction of CBME cover all phases of the MBBS program, including assessment in allied subjects. This article is unique as it focuses specifically on assessment in Phase I and can provide valuable guidance to first-year medical faculty in implementing effective student assessments.

CONCLUSION(S)

The appraisal of the new assessment guidelines of the CBME curriculum aims to address the deficiencies of summative assessment and promote student learning. The proper implementation of IA, following the guidelines, can help identify students' learning needs at an early stage and provide valuable feedback to both students and teachers. This, in turn, enables medical faculty to take remedial actions and enhance the learning experience. The updates in concepts and logistics of IA can optimise its use in improving student learning and ensure that all stakeholders are well-informed. It is important for teachers to adopt a desired change in attitude and approach towards IA, utilising multiple methods to enhance student learning. Overall, IA under the new CBME curriculum is considered the best solution for addressing most of the assessment problems associated with the conventional system of medical education in India.

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