

2.6.1 Methods of the assessment of learning outcomes and graduate attributes

Outcome based assessment

SMVMCH employs a combination of formative and summative assessment techniques with more inclination towards formative methodologies; it's focused on specific competencies required for a physician.

Assessment can be Direct and Indirect

Direct assessment: Direct examination or observation of student knowledge, skills, attitudes or behaviours to provide evidence of learning. Types of direct assessment include:

Formative assessment methods: Continuous assessment is employed throughout the academic year to assess and improve the student learning process. Classical examples include; Continuous Internal Assessments, Seminars with feedback, Viva –Voce, OSPE, OSCE, Assignments, Project works like Model construction, preparation of posters, field visits, maintenance of records, log books are being adopted. Periodical monitoring of attendance and the disciplinary attributes of the students are also being taken care.

Other types of formative assessment include skills training using mannikins, model-based training on surgical techniques, prosection and dissection, think, pair and share, clarification pauses, muddiest point, entry-exit ticket, one minute paper, concept mapping, fish bowl technique, jigsaw techniques, picturing to learn, group discussions, seminar presentations, UNCLE (Unconventional Learning Exercises), CAL (Computer Assisted Learning), Quizzes during offline and online classes, simulated patients, OSVE (Objective Structured Video Examination), Virtual grand rounds, surgical video demonstrations in E-Modules and presentations by the students.

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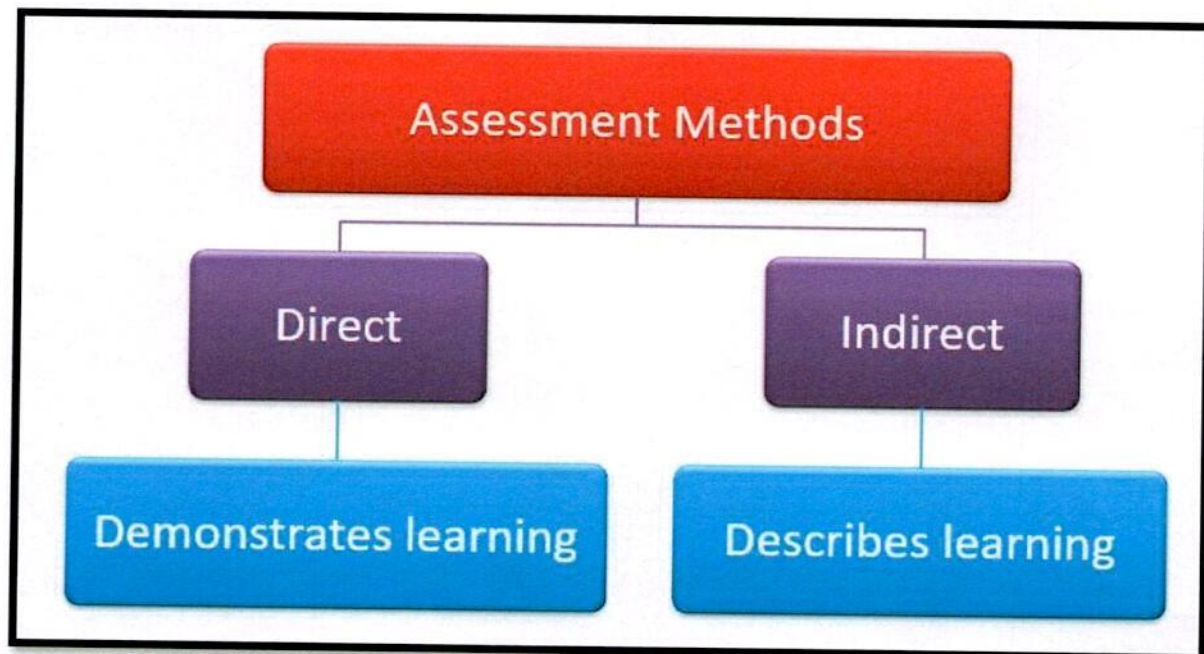
Summative Assessment: Comprehensive evaluation of the learning outcomes is done during the term end exams and model exams. The University examination results help in determining the extent to which the learning outcomes have been attained.

Indirect Assessment: Perceived extent or value of learning experiences. Example: Student survey, alumni feedback, teachers' feedback, parents' feedback.

Assessment tool box

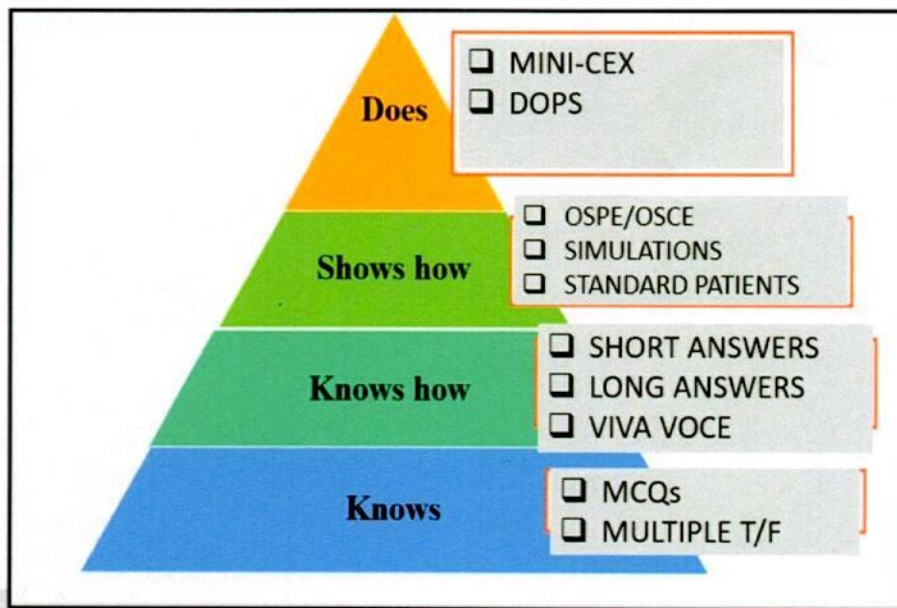
Since, no single assessment can provide us with a clear picture of assurance that learning has happened and student has gained the knowledge/skill/values. So, the Medical Education Unit (MEU) has taken initiatives to build the assessment tool box, which provides a variety of choices of assessments that can be employed by the departments to test the various domains of learning. The complete development of the tool box is under process. The screen shot of the tool box is as under:

Figure: Types of Assessments




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Figure: Sample Assessment methods based on Miller's pyramid



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1. Purpose

To provide objective methodology to evaluate the attainment of the stated departmental competencies, Program Specific Objectives (PSOs) and Indian Medical graduate (IMG) attributes.

2. Scope

The scope of this SOP involves undergraduate medical (MBBS course) undertaken in the department. It includes:

- To provide objective methodology to calculate the attainment of the stated department specific competencies.
- To evaluate the attainment of the PSOs
- To evaluate the attainment of the IMG attributes.


3. Responsibility

- It is the responsibility of the Head of the Department (HOD) along with mapping co-ordinator of the department to coordinate with the mapping subcommittee under the guidance of the Medical education Unit (MEU) to sensitize, initiate and track the departmental progress of the mapping module.
- MEU co-ordinator and the chairperson will finalize all methodologies related to the mapping module. MEU will organize faculty development programs to update and train faculty on the mapping module.

4. Detailed Methodology

The mapping module involves four major steps:

- Alignment of the graduate attributes, PSOs and competencies
- Calculate Competency attainment
- Calculate PSO attainment
- Calculate IMG attribute attainment

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4. 1. ALIGNMENT OF THE GRADUATE ATTRIBUTES, PSOs AND COMPETENCIES

PSO statements need to be in alignment with the competencies and Indian Medical Graduate (IMG) attributes stated by National Medical Commission (NMC) of India.

Step 1: Refine your Program Specific Outcomes (PSOs) statements in alignment with IMG roles, namely clinician, professional, leadership, communicator, life-long learner.

Step 2: List your competency statements

Step 3: List your Program Specific Outcomes (PSOs) statements

Step 4: Align your Graduate Attributes with PSOs

Step 5: Align the competencies with the stated PSOs.

Note: A single competency can be mapped to a single or more PSOs as per the department consensus.

4. 2 CALCULATE COMPETENCY ATTAINMENT

4.2.1 Initial Competency attainment

Initial competency attainment can be done after each formative or summative assessment (Theory, practical/ clinical postings, clerkship)


Step 1: Prepare the Answer Keys/ checklist with competency number & Bloom's taxonomy for the question paper for which competency attainment has to be calculated

Step 2: Enter the individual question wise answer marks for each student in Excel sheet

Step 3: Calculate the average score obtained for each question

Step 4: Fix the threshold for attainment for each question Based on the difficulty level:

- ✓ Lower Order Thinking (LOT) recall based questions -90% of the total mark
- ✓ LOT Understanding based questions-70% of the total mark
- ✓ Higher Order Thinking (HOT)-50% of the total mark
- ✓ For MCQs and structured viva- 0/1 (Threshold fixation not needed; either 0 or 1)
- ✓ If a question has both components of LOT and HOT- calculate the average

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Step 5: Calculate the number & percentage of students who attain the threshold levels.

Step 6: Fix the target level for each question as given below:

Level	Target for attainment
0	<30 of students scoring more than threshold
1	31-49% of students scoring more than threshold
2	50-70% of students scoring more than threshold
3	>70% of students scoring more than threshold

Step 7: Analyze the competencies of the topics tested. Calculate the average if same competency is tested multiple times

Step 8: Discuss the attained, unattained and not addressed competencies.

Step 9: Discuss the action plan for the unattained and not addressed competencies.

4.2.2 Final Competency Attainment

Final Competency attainment can be done at the end of the academic year after all formative and summative assessment have been carried out.

Step 1: Enter the initial competency attainment scores for all the stated competencies. A single competency may be addressed multiple times in different tests

Step 2: Take the average of all the competency attainment scores for each competency.


4.3 CALCULATE PSO ATTAINMENT

4.3.1 Initial PSO attainment

Calculate the average level of attainment score for the stated PSOs mapped with the respective competencies. This gives the initial PSO attainment.

4.3.2 Final PSO attainment

Final PSO attainment can be calculated after the University results are declared. Both direct and indirect assessments are taken into account for calculating the final PSO attainment.

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Step 1: Calculate the university pass percentage

No. of students passed/No. of students appeared*100

Step 2: Fix the targets for attainment and grade the university pass percentages separately as 0,1,2,3. (Department consensus)

Step 3: Find the average score obtained by all the students appearing for a particular university exam

Step 4: Fix the targets for attainment and grade the average score as 0,1,2,3. (Department consensus)

Step 5: **Direct assessment** is calculated based on the grading-80% weightage to the initial PSO attainment, 10 % weightage to university pass percentage and 10% weightage to the university average scores.

Step 6: Indirect assessment can be done using course exit survey/faculty feedback/parents' feedback/feedback from student support system, feedback from attenders, clerks and technicians. Percentage for each competency will be calculated, average will be taken and graded as 0,1,2,3 (Department consensus).

Step 7: Final PSO attainment is calculated based on the weightage as: 80-90% direct assessment+10-20% Indirect assessment

Step 8: Level of attainment is equal to or greater than 2 is considered to be attained. Less than 2 is not attained


Step 9: Analyze the attained and unattained PSOs

Step 10: Discuss the action plan

4. 4 CALCULATE IMG ATTRIBUTE ATTAINMENT


Step1: Sum the final PSO attainment scores for the aligned IMG graduate attributes

Step 2: Discuss for action plan for the unattained and unaddressed IMG roles

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GLOSSARY

- ✦ **Competency:** The ability of a health professional that can be observed. It encompasses various components such as knowledge, skills, values, and attitudes. Competency is the application of competencies in an actual setting, and an individual who is able to do so is considered competent.
- ✦ **Program Specific Outcomes (PSOs):** The knowledge, skills, attitudes and techniques learnt at the end of the professional year.
- ✦ **Program Specific Outcome (PSOs) statements:** These are the statements that define the overall knowledge, skills and attitudes to be learnt at the end of the professional year.
- ✦ **Indian Medical graduate (IMG):** The aggregate knowledge, skills and attitude acquired by a health professional at the end of the entire MBBS degree
- ✦ **Lower Order Thinking (LOT):** As per the Blooms taxonomy, educational goals were categorized into lower order thinking namely; remember (recall facts and basic concepts) and understand (explain ideas and concepts).
- ✦ **Higher Order Thinking (HOT):** As per the Blooms taxonomy, educational goals were categorized into higher order thinking namely; apply (use information in new situation), analyze (draw connections among ideas), evaluate (justify a stand or decision) and create (produce new or original work).

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