

## Original Article

### Faculty Perceptions of Theory Question as an Assessment Tool : A Survey

Anjan Adhikari<sup>1</sup>, Santanu Munshi<sup>2</sup>, Moumita Roy<sup>3</sup>, Sangita Bhattacharya<sup>4</sup>,  
Rania Indu<sup>5</sup>, Anup Kumar Das<sup>6</sup>

**Background :** Medical Education is recognized as an essential system for ensuring the quality of health of common people. Assessment plays a very important role in guiding the direction of the development of meaningful learning. Theory question paper is a tool for the evaluation of medical students. Theory questions should be properly framed for meaningful learning.

**Method :** A survey was conducted among the teachers/faculty members of a Medical College in Kolkata, West Bengal, India, to evaluate the knowledge and perception of the faculty members on important aspects related to the framing of theory question papers for undergraduate medical student's assessment. The knowledge and perception of the faculty members were explored using a pre-designed, pre-coded, pre-tested, questionnaire with both closed and open ended questions. In the present study, perception regarding framing of theory questions for assessment was collected from 41 faculties from different Departments.

**Results :** Most of these participants (31.7%) belonged to the age group of 51 to 60 years. Sex distribution revealed a male predominance(60.9%). 52.5% of the faculty were found to be using a blueprint for framing a question paper for the theoretical assessment of the students. The faculty also opined that there is a definite need of Faculty Development Program (FDP) on framing of theory questions.

**Conclusion:** Present study explored different important facets of assessment through framing of theory questions. Such studies are required to strengthen the assessment system. This helped in ensuring the objectives of education with effective learning.

[J Indian Med Assoc 2021; 119(1): 47-51]

**Key words :** Assessment, Theory Questions Faculty Development Program (FDP), Learning.

**M**edical education is the curriculum of education for medical students or medical practitioners. In this modern era, medical science is changing every moment with discoveries and inventions. Regular modification of this course is thus essential to incorporate the newer developments, newer understanding, etc. Educated and skilled teachers are thus essential to train future clinicians. Assessment is an essential part of medical education. Assessment is the key motivator to learn and thus appropriate assessment tool is required to evaluate the

<sup>1</sup>MBBS, MD (Pharmacology), Professor and Head, Department of Pharmacology, Coochbehar Government Medical College, Coochbehar 736101

<sup>2</sup>MBBS, MD (Pharmacology), Professor and Head, Department of Pharmacology, Calcutta National Medical College, Kolkata 700014 and Corresponding Author

<sup>3</sup>B Pharm, M Pharm, PhD, Assistant Professor, Department of Pharmaceutical Science, JIS University, Kolkata 700109

<sup>4</sup>B Sc, M Sc, M Tech, PhD, Research Scholar, Department of Bioscience and Engineering, School of Bioscience and Engineering, Kolkata 700032

<sup>5</sup>B Tech, MS, PhD, Research Scholar, Department of Bioscience and Engineering, School of Bioscience and Engineering, Kolkata 700032

<sup>6</sup>MBBS, MD (Pharmacology), Principal, Lord Buddha Koshi Medical College, Saharsa 852201

**Received on : 08/07/2020**

**Accepted on : 22/07/2020**

#### Editor's Comment :

- Most of the faculty opined that theory questions should cover the learning objectives of the syllabus.
- The theory questions should evaluate the interpretation skill of the students.
- The faculty also suggested that the question paper should be based on "must know", "useful to know", and "nice to know" areas.
- A blueprint is essential for framing a question paper for the theoretical assessment of the students.
- The faculty were also aware of the significance of Faculty Development Program (FDP) for framing theory questions.

performance of the medical students<sup>1</sup>.

Assessment method can be of two different types; summative assessment and formative assessment. Summative assessment usually occurs at the end of a particular module or course. It focuses on the outcome of a program. It summarizes a student's progress at the end of a particular term. It helps to understand whether the academic objectives set for a particular course has been achieved or not. Summative assessment is a reflection of cognitive achievements commonly. It is the most primitive method of assessment practiced throughout the world<sup>2</sup>.

Formative assessment is, on the other hand, defined as "a wide variety of methods that teachers

use to conduct in-process evaluations of student comprehension, learning needs, and academic progress during a lesson, unit, or course<sup>3</sup>. It motivates teacher-student interaction. It provides valuable feedback that helps the tutors to identify the students' learning capability and improvise their teaching skills. This type of assessment encourages a dynamic learning process, helps to identify the strength and weaknesses of students and improves the quality of teaching<sup>4</sup>. A longitudinal cohort study among undergraduate students of Caribbean Medical School showed significant improvement in academic performance of students after implementation of formative assessment while teaching<sup>5</sup>. Formative assessment with appropriate tool was also developed to enhance the learning skill in medical students of LN Medical College, Bhopal, India<sup>6</sup>.

A hierarchical model for the assessment of clinical competence was proposed by Miller in 1990<sup>7</sup>. According to this model, assessment of cognitive skill precedes the assessment of behavior & skill in practice. Professional authenticity improves from the base to the top of the model. Assessment of cognition comprises of knowledge and its application. Competence in controlled conditions, in practice, is evaluated by assessment of behavior. Several assessment methods are thus employed to achieve the learning goal. Each method has its advantages and limitations. Thus, the employment of more than one method has proved to be useful in achieving the learning objectives<sup>8</sup>. Various methods & tools are introduced to evaluate the student's understanding, knowledge, and competency about a course<sup>8,9</sup>. Few of these include:

- Written examination- This is an old method of evaluating pupil's cognitive skills.

- ◆ Long essay questions are given to evaluate complex learning situations. These questions are essential when the student tries to summarize, describe, or provide information about a new situation. They require more time to answer. This helps to evaluate the recall capacity of a student.

- ◆ Modified Essay Questions (MEQs) comprise a case followed by a series of questions, pertaining to the case. This type of question is essential to evaluate a student's problem-solving capacity, reasoning skill, understanding of a concept, and capacity to apply the knowledge.

- ◆ Short Answer Questions (SAQs) comprise unambiguous open-ended questions that require an answer in one or two words/sentences.

- ◆ Multiple Choice Questions (MCQs) requires the candidate to select one best answer from three or more options. These types of questions evaluate the cognitive, reasoning, understanding, problem-solving, and application skill of the student.

- Oral Examination/Viva: It is based on student-teacher interaction. Often this method has biasness and thus need to be implemented carefully.

- Objective Structured Clinical examination (OSCE) is a method to evaluate the clinical skills of a student. In this test, student is asked to conduct multiple tasks at a number of 'stations'. It helps to estimate various aspects of the student's clinical competence. OSCE also evaluate all the three domains.

- Mini-Clinical Evaluation Exercise (Mini-CEX) is a rating scale implemented by the American Board of Internal Medicine to assess six core competencies of physicians: medical interviewing skills, counselling skills, physical examination skills, clinical judgment, humanistic qualities/professionalism, organization, and efficiency.

- Direct Observation of Procedural Skills (DOPS) is a structured rating scale for judgment of technical skills and practical procedures.

In the theoretical examination, it is the sole responsibility of the faculty/assessors to frame a rational, and effective question paper that can correctly assess the performance of the students, highlight the understanding of the subject and in turn, give valuable feedback of the learning process. Examiners need to evaluate the course contents and frame questions based on the area of importance according to must know, nice to know, and desirable to know. Proper marks distribution needs to be provided following the norms of Universities. There are very few studies that investigate the skill and quality of medical teachers to frame effective question papers for theory examination. Hence, evaluation of knowledge and perception of faculty in framing theory question papers for assessment of medical education is the need of the hour. It is also essential, at the same time, rational to implement faculty development programs to train and improve the skills of the faculty so that they can prepare a justified question paper.

#### MATERIALS AND METHODS

**Study Type :** Questionnaire-based survey

**Study Duration :** The study was carried for a period of six months from December 2018 to May 2019

**Place of Study :** Department of Pharmacology.

**Study Population :** Medical education faculty under West Bengal University of Health Sciences were included in the study following the inclusion criteria and their willingness for participation. Study population comprised of faculty from different Departments of the Medical College.

**Inclusion Criteria :**

- Faculty, participating in the preparation of theory question papers for undergraduate students' summative theory assessment for college or university

- Minimum qualification : Postgraduate in the discipline

- Minimum 2 years of teaching experience

**Exclusion Criteria :**

- Faculty who were directly involved with the study

**Ethical Clearance :** Ethical clearance was obtained from the Institutional Ethics Committee.

**Study Design :** The preparatory phase of the study included the preparation of the questionnaire, its pre testing. Later on a survey was done on the predesigned, pre tested, pre coded questionnaire for evaluating the perception of the teachers for framing of questions for theory assessment. So, it is a questionnaire based cross sectional survey.

**Statistical Analysis :** All the data will be entered in Microsoft Excel 2010®. The data was calculated by using the Statistical Package for Social Sciences Software 21.0 (SPSS)®.

**RESULTS**

Primarily 41 responses were collected from faculties of different departments, pre and para-clinical (30) and clinical (11). As per age groups of study population, the maximum number belonged to the age group of 51 to 60 years, ie, 13 (31.7%), followed by 31 to 40 years, 26.8 %, with a male predominance, ie, 60.9% (25) and faculty belonged to undergraduate study (22, 55%). Faculty was categorized according to the length of examinership completed in years at university level. Out of the total respondent of this question (n=23), the maximum population has experience as examiner is between 5 to 10 years, 9 (39.1%), followed by below 5 years and above 10 years, nearly the same. Regarding the training status of faculty, 21 (56.7%) had basic Medical Education training, recognized by Medical Council of India (MCI). Out of the trained faculty (n=21), maximum was trained within 5 years, 12 faculty (57.1%).

Fig 1 revealed the perception of the faculty on whether theory questions should cover the learning objectives of the syllabus. 23 (56.09%) faculty strongly agreed to the fact that the learning objectives should be covered in the theory questions whereas only 2(4.87%) faculty (n=41) strongly disagreed with this notion.

Fig 2 revealed the perception of faculty on different aspects of students' knowledge to be evaluated in theory examination. Most of the faculty 35 (85.36%) opined that theoretical assessment should be such that the interpretation skill of the student can be evaluated. Assessment of the student's knowledge based on theoretical examination relies greatly on the questions and the ease of the language in which the questions have been set. Almost all of the faculty supported (46.34%-Strongly agreed, 46.34%- agreed) with this opinion.

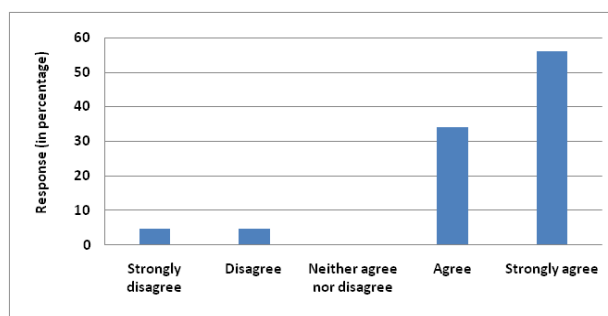


Fig 1 — Perception of faculty on the issue of "Theory Examination Questions" should cover the learning objectives of the syllabus"

"For a theory assessment paper to be valid, it should match course content, have a proportional weighting of content according to clinical importance, consist of questions which are neither overly difficult nor easy and have multiple tools to determine various types of information". To this statement, 20 faculty (48.78%) and 18 faculty (43.9%) were in agreement with the fact that the validity of a question paper depends on multiple tools to determine proper students' assessment.

Table 1 evaluated the perception of faculty on types of questions to be included in the summative assessment for better assessment of the students, 39 (95.12%) and 33 (80.49%) faculty opined that the questions should be "Problem-based" and "justify with answer".

Regarding the opinion of faculty on area of Questions, 23 (56.1%) faculty agreed to the issue that the question paper should be based on "must know", "useful to know" and "nice to know" areas whereas 18 (43.9%) of the study population opined that the question paper should be framed only on "must know" and "useful to know" areas.

Maximum of the faculty came in agreement (Agree- 58.54% and strongly agreed- 29.27%) that use of a blueprint helps in defining a purpose and scope for determining the content of the question paper (Fig 3).

Table 1 — Perception of faculty about "Types of Theory questions to be included in the summative theory assessment"

Perception of faculty on "Types of Theory questions"	Number of Participants (n= 41)	Percentage (%)
Essay type (EQ)	5	12.20
Short EQs	12	29.27
Problem based question	39	95.12
Short notes	19	46.34
Short answer questions (SAQ)	24	58.54
Justifying the given statements	33	80.49
Traditional True/False	6	14.63
Multiple choice questions (different types)	23	56.10
Briefly describe the mechanism of action	22	53.66
Any other suggestion	5	12.20

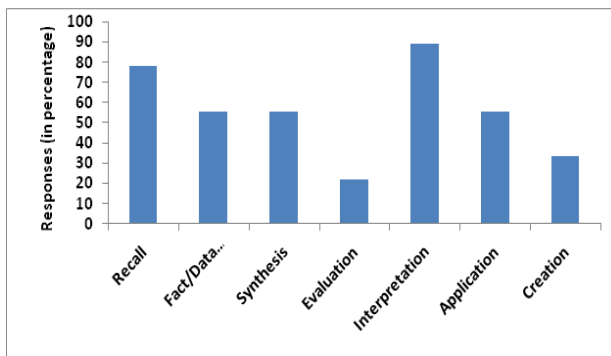


Fig 2 — Perception of faculty on 'Evaluation of different aspects (eg, recall, synthesis, interpretation) of student knowledge' in the theory assessment

83.33% (30) of the faculty suggested that use of a blueprint helps in framing a well-organized question paper 26 (72.22%) and 22 (61.11%) of the faculty suggested that by proper use of blueprint "Students can be tested on different cognitive domains" and "makes the assessment more objective" respectively.

Faculty expressed their opinion on the repetition of previous year theory questions. Some faculty responded that "important questions should be repeated". Some responded that "Topics may be repeated with different clinical problem-based questions." 100% of the faculty responded that marks allotment in a long question should be divided into several components with specific scoring for individual parts. In response to the issue, it is necessary for a student to get 50% marks in theoretical paper alone to get through the examination and 65.85% (27) of the total respondents went on with this notion. Few faculty who disagreed with the above issue opined that "cut off marks should be variable according to the scenario" or pass marks should be 40% or "practical performance should be evaluated before deciding whether the student would fail".

On requesting suggestions for improvement of assessment in undergraduate medical theoretical examination, some faculty came up with new suggestion and ideas like "OSCE may be included", "Extended Multiple Questions (EMQ) to be introduced", "Applied aspect should always be kept in mind prior framing every single question", etc.

#### DISCUSSION

Education is the process of acquisition of knowledge. It is the pillar of the development and progress of society. Education can be achieved through the teaching and learning process. The tradition of transfer of knowledge from teachers to students is practiced since times immemorial. Assessment has become an inevitable part of the process of teaching-learning. It helps to motivate the students to learn, increases the understanding of the students, and also

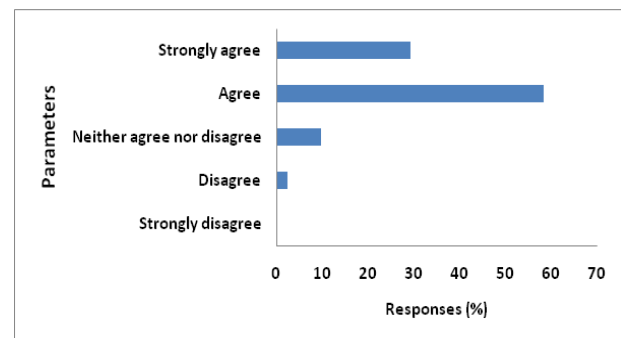


Fig 3 — Perception of faculty on the statement "A blueprint provides a systematic multi-step approach to an assessment, defining the purpose (eg, formative/summative and written/practical) and scope (eg, for undergraduate or postgraduate students) of the test to subsequently determine content and method of assessment"

provides valuable feedback on the process of teaching<sup>10</sup>.

Knowledge and perception of faculty were estimated in the present study through a questionnaire survey. The mean age of the faculty in the study was  $44.56 \pm 1.68$  years. Male predominance of about 60.9% was observed. A similar study in a Medical College in West Bengal, India, showed the average age of the study population was in between 38-64 years, where it was observed that 87.5% was male<sup>11</sup>. Most of the faculty (55%) participated in the study used to teach at the undergraduate level. Faculty development program (FDP) in India is gaining momentum these days. Present study showed 56.7% had training in Medical Education technology. Literature had shown that the number of medical education units has also increased significantly, since 1997, in India<sup>12</sup>. Present study estimated 64.1% of the faculty were keen to join FDP to improve their teaching skills.

Assessment not only helps to evaluate the understanding of the students but also assists the teachers in revising their teaching method in order to achieve the goal of the learning<sup>13</sup>. Thus it is essential to design the theory assessment paper in such a manner that the learning objectives are covered. Present study revealed that 56.09% of the faculty strongly agreed to the fact that the learning objectives should be covered in the theory questions. Most of the faculty in this study opined that the theory paper should be such that, at least, the interpretation, application of cognitive skills of the students can be assessed. A cross-sectional study among undergraduate students in Iran revealed that critical thinking ability of medical students needs to be improved through the process of assessment<sup>14</sup>.

Faculty of the study suggested that more weightage should be given to the questions, which improve the problem-solving skills of the students. Literature

suggested problem-based learning methods have improvised medical education and is practiced successfully in various Medical Colleges in America<sup>15</sup>. 56.1% of the participants in the present study opted that questions should be framed based on “must know”, “useful to know” and “nice to know” areas, mostly focusing the “must know” area.

Blueprint is a map and a specification for an assessment program that ensures that all aspects of the curriculum are covered by assessment programs over a specified period of time. In medical education, blueprint helps to associate assessment with learning objectives. Content of assessment is said to be valid when it is congruent with the objectives and learning experiences, and congruence between these pillars of education can be facilitated by using blueprinting in assessment<sup>16</sup>. Faculty in the Department of Pathology in a Medical College in Karnataka, India, perceived that blueprinting should be an integral part of the process of assessment<sup>2</sup>. In the present study, 52.5% of the total study populations were found to be using a blueprint for the preparation of framing a question paper for theoretical assessment. Present study also reflected that faculty agreed to the fact that blueprint is essential in the assessment process.

#### Limitations :

(1) Due to time limitations only 41 responses were collected from faculty of different Departments, so the sample size was limited and could have been increased to improve the power of the study.

(2) Also to form better opinion the data should have been collected from faculty of more Medical Colleges both Government and Private ones.

(3) The faculty included should also have adequate training and experience in medical education for atleast more than 5 years as University Examinership and of 3 or more different Universities.

(4) It was also very difficult to cover all important topics within the short time span.

(5) Very few studies are available on this topic of “Framing theory questions for assessment of undergraduate students”. So, proper comparison of the study data with national and international data was not sufficient.

#### CONCLUSION

The question framing skill of the faculty ultimately reflect the quality of the system. Present study revealed that the medical faculty were aware of structuration, learning objectives, and areas of importance and blueprinting in framing theory questions. Faculty Development Program is essential

for improvements in different attributes for development of skill of faculty for better assessment.

Finally the UG & PG medical students expectations and demands of such theoretical assessment could have been included.

**Prior Publication :** Nil.

**Permissions :** Ethical permission taken.

**Financial Support and Sponsorship :** Nil.

**Conflicts of Interest :** There are no conflicts of interest.

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