

## ‘Assessment Analysis of First Year Medical Students at AIIMS Gorakhpur- A Quantitative and Qualitative Study’

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### Abstract:

**Objectives:** The students’ learning relies to a great extent upon how they contemplate regarding their assessment. This study meant to investigate the existing assessment pattern at our institute and record the insight of medical students towards the importance of assessment and its feedback on their learning, and how this identifies with their assessment execution.

**Methods:** A blended strategies research configuration was embraced in which a pre-validated, well-structured questionnaire was designed and administered to the students to record their impression of appraisals. Student’ perceptions were additionally investigated in focus group

discussions. Questionnaire findings were correlated with students' assessment data and perception of academic facilitators. **Results:** Students' impression of the degree of trouble of various evaluations reflected their performance in assessments. Students perceived that feedback is essential to permit upgrades and look for all the more opportune, better quality and customized input. **Conclusions:** Academic facilitators distinguished that a portion of the students' recommendations are more practical than others. Students had an uplifting disposition towards assessment yet emphasized the requirement for faculty and residents to feature the significance of assessment to clinical practice.

**Key words:** Assessment, Medical Education, Indian Medical Graduate, Feedback

### **Introduction:**

Prior to the introduction of CBME, the emphasis was on 'assessment of learning'; however, after mandatory implementation of CBME in 2019 by Medical Council of India (MCI), the focus has moved to 'assessment for learning'.<sup>1</sup> Effective assessment in medical education requires tasks that assess cognitive, procedural and communication skills. Single methods of assessment alone are incapable to assess all the attributes required to become a competent health professional. A system-based framework has been suggested to blend single assessments in order to achieve the utmost benefit for all stakeholders.<sup>2</sup> Our article primarily analyses the academic performance of the first-year medical students in the formative and the summative examinations conducted during the first MBBS academic session in the institute. The article also explores the perceptions of the medical students on the teaching-learning and assessment methods presently effected in the integrated undergraduate medical course undergoing at AIIMS Gorakhpur.

### **Organizational context:**

The undergraduate medical course at AIIMS Gorakhpur is an incorporated 5 1/2-year program structured with an objective to make an "Indian Medical Graduate" (IMG) have the essential information, abilities, mentalities, qualities and responsiveness, so that the person in question may work fittingly and successfully as a doctor of the principal contact of the network while being around the world significant.<sup>3</sup> The initial three years of the course give a prologue to the basic essentials, with early clinical exposure and targeting learning the strategies of fundamental clinical aptitudes. The last two years of the program contain instructing clinical subjects through rural and urban clinic based clinical postings with the 6<sup>th</sup> year explicitly assigned as the internship year. Undergraduates are admitted to the medical course

subsequent to clearing the ‘National Entrance Test’ conducted annually. The appraisal design utilized in the course differ from subject to subject and incorporates formative and summative assessments. The theory assessments incorporate multiple choice questions (MCQ), long answer questions (LAQ), short answer questions (SAQ), pictorial-based questions (PBQ), problem-based questions (PBQ). Practical assessments incorporate spotting, stations for viva-voce, Objective structured clinical examination (OSCE), and Objective structured practical examination (OSPE). Subtleties of the appraisal techniques utilized are introduced in Table 1.

### **Methodology:**

#### **Study design:**

A study design utilizing quantitative and qualitative data collection methods was adopted for this study. Quantitative data was collected from the academic performance data of first year medical students in the formative and summative examinations conducted in the first-year academic session. Qualitative data was collected using a specially designed, structured, and pre-validated questionnaire, which was followed by one-to-one counselling session with each and every student in order to record their perceptions, responses and propositions regarding the advantages and disadvantages of various types of teaching-learning and assessment methods.

#### **Study setting and participants:**

The study was conducted over a period of one year from September 2019 to August 2020 in the Department of Anatomy of AIIMS Gorakhpur. Forty seven of the fifty, MBBS first year students participated in the study after giving consent. Three students did not participate in the study. COVID-19 pandemic-imposed lockdown in India in March 2020, students were not available in the college and the entire teaching became online through Google platform. The entire teaching (lectures and practicals) and assessments were conducted online, but the performance of students during this period was not considered in the study as many students could not coordinate with us through online mode.

#### **Study instruments:**

Primarily, a structured questionnaire was specially designed in a google format after an extensive review of literature and rounds of discussions. The questionnaire included questions seeking feedback on the effectivity of various types of teaching-learning methods and

assessment methods in evaluating the students. The questions were aimed at recording the responses and suggestions of the students on various forms of assessment methods.

The questionnaire comprised of objective (one or more option allowed) and subjective (one liner) type of questions prepared by faculty of all the three department of first year MBBS course. The google form was attempted by all the senior faculties and feedback was collected. A pilot study was conducted among the 50 nursing students of batch 2019 and the responses collected, analyzed and amended accordingly. The questions and the answer options were amended in a way to read the mind set/ perspective of the students towards attempting different modes/types of assessment methods. The validated questionnaire was later used for collecting feedback from the medical students at the end of every part completion and semester examinations. Counselling sessions followed this online survey and responses were collected from each student using a checklist and later correlated with those collected from the online google form filled by each student.

Secondly, the assessment data of the formative and summative examinations conducted in the first-year academic session was retrieved and the performance of the students was analyzed based on the score of the students in different types of assessment methods in theory and practical examinations. The data thus collected was tabulated, graphically represented and statistically analyzed. For this purpose, the medical students were categorized in three study groups based on their aggregate scores in all the examinations. The groups were High achievers scoring equal and more than 70% marks, Mid achievers scoring between 70% and 50% marks and Low achievers scoring less than 50% marks.

### **Observations:**

#### **Quantitative data analysis:**

The participating 50 students were classified in three groups as mentioned in table no 2.

Out of the 25 students in the category of Mid-achievers, 9 students scored maximum marks in the 'Multiple choice questions' followed by 7 students who scored maximum marks in 'Long essay type questions. Whereas, as many as 11 students scored the least percentage of marks in 'Problem based type of questions. Please refer to table no 3.

Out of the 23 students in the Low-achievers group, 10 students scored maximum marks in the 'Multiple choice questions' followed by equal number (10) of students scoring maximum marks in 'Long essay type questions. Whereas, as many as 18 students scored the least number of marks in the 'problem-based questions. Please refer to table no 3.

Amongst the two students in the High-achievers group, one scored maximum mark in the 'problem-based questions' while other student scored in the 'multiple choice question'. Both the students scored the least in 'Long essay type of questions. Please refer to table no 3.

Reasons indicated by the students why 'Problem based questions' are difficult to answer? are tabulated. Refer to table no 4.

Changes/modifications suggested by the students in the current academic teaching pattern in order to enable them to answer the 'Problem based type of questions' in a better way. Refer to table no 5.

When asked about the modifications undertaken by the students in their study pattern enabling them to answer 'Problem based type of questions' in a better way; following were the ideas submitted by the students. Refer to table no 6.

### **Qualitative data analysis:**

Based on the online questionnaire survey, 47 students participated out of the total 50 students; three students did not fill and submit the questionnaire despite repeated reminders, so their responses could not be recorded. Following are the responses submitted by the participating students.

- a. When asked whether the current academic teaching pattern impart the knowledge to enable you to answer all the questions in the assessment examination, 63.8 % students (n=30) responded positively. 27.7% students responded negatively and 8.5% of students were not sure of their opinion. For details refer to Figure 1.
- b. When asked that which type of question in the assessment examination is the most difficult to answer; 29.8% of students (n=14) indicated that 'Problem based questions' are the most difficult to answer. 25.5% of students mentioned 'Long essay type questions' as the most difficult to answer whereas 23.4 % of students said that 'Multiple choice questions' are the most difficult. For details refer to Figure 2.
- c. When asked, which pattern of assessment evaluates their academic knowledge comprehensively, 42.6% of the students (n=20) answered 'Multiple choice type of questions' as the type of questions which best evaluated their academic knowledge. 40.4% of students mentioned 'Problem based questions' as the best pattern of assessment. Please refer to Figure 3.
- d. When asked, which pattern of question in the assessment examination did they find difficult to answer despite of having the knowledge about it; 34% of students (n = 16)

mentioned 'Problem based questions' as the most difficult to answer despite having the required knowledge. 29.8% of students mentioned 'Long questions' as the type of questions which they find difficult to answer despite having knowledge about it. Please refer to Figure 4.

### **Discussion:**

This study has highlighted the experiences and perceptions of medical students regarding assessment. Overall, our findings corroborate previous research outcomes as they indicate that the effort and time put into learning by the students is highly influenced by the type and relevance of assessment.<sup>1-3</sup> The students identified few issues related to the methods, and quality of assessment and academic feedback. Other issues identified include incorporating more clinical oriented discussions and assignments, discrepancies in study resources and infrastructure, and average standards of teaching.

### **Timeliness and consistency of feedback and assessment:**

Feedback from the faculty and residents is not only a key component of student learning but is also a surrogate for teaching quality.<sup>4</sup> Overall, students were unhappy with the lack of timeliness, inconsistency and poor quality of the feedback they received across the year. This has been documented by other studies both nationally and internationally.<sup>5</sup>

With regards to feedback, students complained that they hardly received any feedback on their academic performance from the academic facilitators throughout the academic year. The need for immediate feedback has been validated.<sup>4</sup> While timeliness of feedback is a recurring theme in the literature, students expect this as it provides them an opportunity to improve in subsequent assessment tasks<sup>6</sup> and also as a form of reassurance.<sup>7</sup>

With regards to assessment, students stated that formative and summative assessments were conducted too frequently with large syllabus in each test. The students stated that they were unable to study, due to lack of time. The reason given was lack of coordination between the first-year departments regarding the schedule of their respective formative assessment tests.

### **Assessment pattern and performance:**

Overall, the students are content with the assessment pattern and the type of questions asked. They suggested that the teaching should be more focused on the clinical correlates. The higher organized perception in undergraduate medical students can be better assessed through well-constructed multiple-choice questions as compared to modified essay questions.<sup>8</sup>

### **Effect of assessment on student's learning:**

1. Assessors are significant and persuasive components in the educational impact of assessment. Their inspiration to direct a legitimate appraisal, their disposition towards the evaluation, their attention to the motivation behind the appraisal, their insight and expertise to plan a specific kind of assessment, just as their leniency/stringency can influence students' learning<sup>9</sup>. In a recent report by Tiwari et al,<sup>10</sup> the students expressed that the endeavors they made to get ready for the assessment relied upon how tough the assessor was.
2. The consequences of Cobb et al. indicated that students' decision of way to deal with study is impacted by the assessment<sup>11</sup>. In addition, Henneman et al. and Opoka et al. exhibited that evaluation propels and instigates students to study.<sup>12-13</sup>
3. The eventual outcome of the activities and associations of the contributing components, through the previously mentioned systems, is an adjustment in learning content, profundity of learning, the sturdiness of learning and at last the students' emotional involvement. These are really the perceptible outcomes driven from assessment. Comparative discoveries in the writing were found<sup>9</sup>.
4. The contextual factors, for example, peers, family, institution facilities, community values and students' extracurricular activities were found to influence the student's learning.<sup>9</sup>

### **Recommendations and Future Research:**

1. Counselling session should follow every formative assessment of the students, where the faculty or residents should provide feedback and progressive challenges to the students.
2. Students contemplate faculty feedback as vital to improve their learning. Residents and tutors should be proficient in various assessment methods and how to provide feedback to the students.
3. The proportion of viva-voce should not exceed 40% of the total marks of practical assessment. 'Objective Structured Practical Examination' is much appreciated by the students and should be conducted during every formative and summative practical examination. [Board of Studies, 2020: AIIMS Gorakhpur, India]
4. In theory assessment, the long questions, and short notes should be very well structured and precisely directed with no confusion as to what answer is expected from the students.
5. The Theory assessment should be ideally entirely based on 'Multiple choice questions' with focus on clinical case/problem-based topics. [Board of Studies, 2020: AIIMS Gorakhpur, India]

6. The complete teaching schedule with all the lectures/practicals/demonstrations/integrated classes/quizzes/seminars along with detailed assessment schedule should be asserted to the students at the commencement of the semester itself.
7. Model answers for descriptive questions and answer keys with explanations should be prepared by the faculty and residents for evaluation and the same should be provided to the students.
8. Future research should be focused on the increased involvement of students in the teaching-learning and assessment module, to promote self-directed learning by creating autonomy supportive environment.

### **Strengths and Limitations of the study:**

The primary quality of this study is the utilization of blended techniques to locate information and give relevant and profound comprehension of the information discoveries. Also, there was no researcher bias as the participants were allowed to communicate their sincere responses since, they filled and presented the questionnaire form through online mode. A significant impediment of this study is the modest number of members in some study groups. Nonetheless, some study groups were smaller (two members). Additionally, this study may not be generalizable to different settings with various educating and appraisal strategies.

### **Conclusions:**

‘Problem based questions’ are the most difficult to answer despite of having the knowledge about the topic. Students demand clinical oriented teaching mainly through integrated lectures, small group discussions and early clinical exposure.

‘Multiple choice questions’ evaluates the student knowledge comprehensively. They demand more revisions and assignment of multiple-choice questions from the faculty and residents.

Students demand post-assessment counselling sessions from the faculty and the residents giving feedback to them on their performance.

Students bid for more access to study resources like power point presentations, extra hours of faculty supervised group discussions, e-books, additional short assessments, etc. and additional facilities like drawing classes, etc.

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study. The authors wish to acknowledge the contributions of all the medical students who participated in this study. The authors wish to sincerely appreciate the compilation work of the assessment data done by Dr. Rakesh Kumar Jha and Ms. Chaitanya.

**Ethical statement:**

The qualitative analysis made in the present study is based on questionnaire-based survey conducted amongst the first-year medical students after taking their informed consent. All the participants were informed in advance regarding the purpose of this survey, and they were explained that their responses will be kept strictly confidential. The findings of the survey were later disclosed to all the participants during the counselling sessions. The quantitative analysis is conducted by using the assessment data of the examinations conducted within the Department of Anatomy of the Institute. There is no requirement of Institutional Ethical Committee approval for using the said assessment data of the medical students. The Head of the Department of Anatomy has the complete authority to use the assessment data of the examinations conducted within the said department. A letter can be provided to the Editor in Chief, if required to support this statement.

**Dissemination history (where applicable):** This article has not been presented anywhere or the content of this article has not been published anywhere before.

**Conflict of interest:** All the authors declare no conflict of interest amongst the authors or between the authors and the organization or with any other financing agency.

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**Table 1. Assessment format and types**

<b>Assessment format</b>	<b>Assessment types</b>	<b>Description</b>
Theory examination	Multiple choice questions (25%)	Recall based, Clinical case related, reason-assertion type, matching type, etc.
	Long essay questions	Structured, 05-06 marks each
	Short questions	Embryology, Histology – 2 marks each
	Diagram-based questions	Gross anatomy, histology - 2 marks each
	Problem-based questions	Clinical case scenario-based questions – 1 mark each
Practical examination	Viva voce (10%)	Includes four stations of soft parts and surface anatomy, osteology with radiology, histology and embryology.
	Spotting	10 spots (of histology, osteology, radiology, soft parts, embryology and clinical pictorial based question) of 1 mark each.

**Table 2: Classification of students in following three groups**

<b>Participants groups (n=50)</b>	<b>Male students</b>	<b>Female students</b>	<b>Total</b>
High achievers	01	01	02
Mid achievers	12	13	25
Low achievers	19	04	23

**Table 3: Percentage of marks scored in various types of assessment types by the students**

Participant groups	Percentage of marks scored in various types of assessment (%)					
	MCQ	LQ	SN	DBQ	PBQ	Total participants
High achievers	85.00	72.9	65.6	60.9	43.75	02
Mid achievers	68.54	55.9	51.1	46.4	36.9	25
Low achievers	42.08	40.6	32.3	22.8	10.93	23

MCQ- multiple choice question, LQ- long question, SN- short notes, DBQ- diagram based question, PBQ- problem based question

**Table 4: Reasons indicated by the students why ‘Problem based questions’ are difficult to answer?**

Sl.no	Responses given by the students	Number of Responses
1	Proper time management is required	02
2	It requires line by line information	01
3	Questions are confusing	04
4	Requires specific answer demanding deep understanding of the subject	04
5	Basic concepts need to be very well cleared and good clinical knowledge about various topics	15
6	More practice required	16
7	Unable to relate it with clinical terms at the same time	01
8	Not enough cases discussed in the class	02
9	Takes longer time to read and are confusing	01
10	Difficult to remember	01

**Table 5:** Changes/modifications suggested by the students in the current academic teaching pattern in order to enable them to answer the ‘Problem based type of questions’ in a better way.

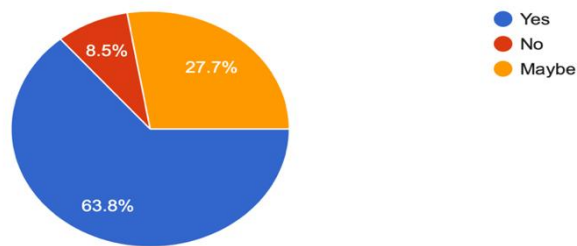
Sl.no	Modifications suggested by the students	Number of Responses
1	No change required	04
2	Frequent short tests on clinical based questions to be scheduled	12
3	Teaching to be more focused on clinical portion	24
4	Part completion tests to be conducted on the similar pattern of professional exam	03
5	Drawing classes to be scheduled	01
6	More integrated lectures combined with case-based learning	01
7	Power point presentations of the classroom lectures to be provided to the students after the lecture so that time won't be wasted in writing down the notes	01
8	Teacher should draw all the diagrams on board instead of power point presentation	01

**Table 6:** When asked about the modifications undertaken by the students in their study pattern enabling them to answer ‘Problem based type of questions’ in a better way; following were the ideas submitted by the students.

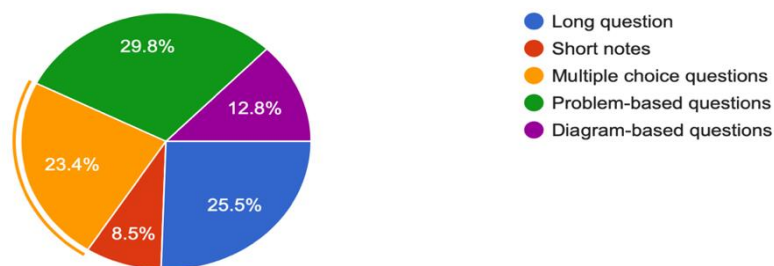
Sl.no	Modifications in the studies undertaken by the students	Number of Responses
1	Study using online sources	03
2	You tube lectures in which they teach using power point presentation or chalk and board	02

3	Reading thoroughly the whole syllabus	01
4	Solve more multiple-choice questions	03
5	Undertaken more diagram practice	04
6	Reading books written in a systematic language	01
7	Practicing more with clinical based questions and more use of diagrams	11
8	Giving extra time to clinical based questions	01
9	Engaging in group study	01
10	Engaging in deep reading of the topics	05
11	Revising the difficult topics repeatedly	09
12	Consulting faculty members	02
13	Short and crisp points told by the teachers, I wrote them and revised them on a regular basis	04

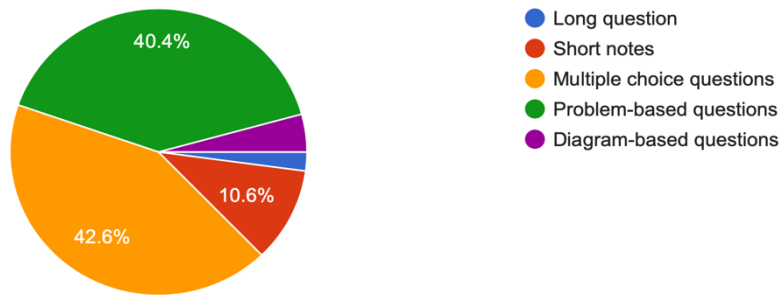
Graph 1.



Graph 2.



Graph 3.



Graph 4.

