

Assessment and Evaluation - In Perspective of Medical Education

Abstract

Education is the backbone of the any nation. It decides the economical and social growth of people in that country. Medical education is based on learner skills and practice. Without practice a person cannot work in this field. The aim of this paper is to describe the various assessment uses in medical education. There is huge difference in traditional and modern education. Students of 21st century are technology based so teacher must be equipping himself with technology. Now a day's word teaching is replaced by term learning. Students having already the entire subject related material in their computer or mobile. The work of teacher is to explain about the concept. During assessment of teaching, 2 methods are very familiar, which are formative and summative assessment. Formative assessment is carried out by a teacher to find the knowledge of a learner at the end of each chapter or unit. The teacher can also evaluate his class room or teaching performance after each lecture. Summative assessment is carried out at the end of semester or year to evaluate the overall performance of a candidate. It is also known as term examination or cumulative examination. Now a day's many new methods are available for teaching in medical education like demonstration, simulation.

Conclusion: Clinical simulation and objective structured clinical examination (OSCE) are new methods used for assessment of medical students.

Keywords: Assessment; Evaluation; Concept; Knowledge; Practice; Formative and Summative assessment

Abbreviations: OSCE: Objective structured clinical examination; OSCE: An objective structured clinical examination; OSPE: Objective Structured Practical Examinations.

Introduction

Medical education is quite different from the technical and vocational education. Medical education applies the

theories directly into practice. It is a skill based profession. It is branch of medical science which deals with human body for the prevention and cure of any diseases.

Teaching plays a vital role in the life of human being. It is two way process, where teacher deliver the content and students ready to grasp the concept of the content. In ancient time, the education was given by Guru to their

Comment [AR1]: The abstract does not tell what is to come in the rest of the manuscript. Very short disconnected sentences and there is no flow to the write up. There is confusion between assessment of student vs assessment of teaching

Comment [AR2]: Grammar and sentence formation is incorrect

Comment [AR3]: Improper Use of tenses, connection between concepts and sentences

pupils in Ashram's known as Gurukul. Teaching is a skill based job, so we can say; it is an art and science. Teaching used to reflect the passion and beauty of the delivering content to learner. It is a direct interaction between teacher and learner [1].

Knowledge is the wealth of 21st century. Teaching and learning both are the parallel step to gain the knowledge. Now a day's teaching is the learner centric.

Teaching is a complex, honest and regular activity that involves mastery over the content and concept. Teaching includes many features like classroom control, organization of content, and command of teaching skills. Teaching consists not only of instruction, it also includes thinking process and decision making capability of students [2].

Assessment is derived from Latin word which means "to sit beside and judge". It is used to describe the systematic gathering of information about what the learner should know at the end of each unit or lesson. Some of the people link assessment with intelligence, IQ level, marks or percentages. It also creates badges like excellent, good, average or poor. Assessment itself is very broad term, which includes knowledge, attitude, self learning, commitment etc. [3].

More specifically, classroom assessment refers to the process of gathering, recording, interpreting, using and communicating information about their progress and achievement during the development of knowledge, concepts, skills and attitudes.

Assessment

Assessment is the state or process of understanding the position of student in class. It includes observation, weekly examination and regular progress report.

Types of Assessment

Formative assessment: It is an assessment which is carried out by a teacher to find the knowledge of a learner at the end of each chapter or unit. The frequency of assessment will be weekly, fortnight, monthly or quarterly. A learner can adopt new principles to improve his performance in next examination.

• **Example:** class test, quiz, assignment, viva, oral presentation, case studies, lab report etc.

Summative assessment: It is an assessment which is carried out at the end of semester or year to evaluate the overall performance of a candidate. It is also known as term examination or cumulative examination. It will be in term of percentage, grades or marks. It is also useful for the measurement of course outcome. It is prepared to determine the extent to which the instructional objectives have been achieved. This report is very useful for accreditation, grant and marketing of institute. "Summative" assessment is also known as "evaluation."

Evaluation

Evaluation is the process in which a person observes the performance of someone. It might be direct or indirect evaluation to observe the candidate. It gives an idea about the quality of education and position of learner.

Evaluations should be always valid, reliable, acceptable, feasible and useful. It should create strong impact in the right direction. The goals of evaluation should be clear from the start (Table 1).

Assessment	Evaluation
Is ongoing process	Provides closure of observation
Improves quality of learner	Judges quality of learner
Individualized approach	Applied against standards
It does not mean grade	It is Grade
Provides feedback	Show shortfalls
It is completely Process-oriented	It is Product-oriented
It is the means	It is the end

Table 1: Difference between Assessment and Evaluation.

According to the findings of some research paper, problem-based learning is the most effective assessment method from the student point of view. Thus, to improve the teaching and learning processes, the following items are suggested:

- Enhance student understanding by arranging more problem-based sessions in class. The style of problem-based learning can also be varied by giving students a current topic of interest and initiating debate. Real-world case studies are also encouraged.
- Inviting guest lecturers to give lectures on real-life experience on particular issues in the industry, which is usually lacking in the academic environment?
- Assigning more marks toward other weaker assessment methods such as closed-book and open-book mid-semester tests, to achieve the balance among all assessment methods in the course [4].

Comment [AR7]: Reference????

Comment [AR8]: Evaluation is passing of judgment

Comment [AR4]: Teaching doesn't include students critical thinking. - It is catered to enhance students skills in these essential competencies. There are multiple places where the distinction between students and teaching has not been correctly used in sentences

Comment [AR9]: If this is reference to Vleutens or Norcinis elements of utility criteria then it needs to be corrected

Comment [AR10]: PBL is not an assessment method - where is the evidence to this claim

Comment [AR5]: There is more to assessment than this. It should be properly cited

Comment [AR6]: Classification of assessment based on its purpose is formative /summative. Former is done to identify learning gaps, feeding is an essential mandatory feature of formative assessment. It also factors in the consequences - low stake vs high stakes. None of this is coming across in the description of formative assessment

A study was conducted to find out perception of the medical students of KIMS, Bhubaneswar regarding the prevailing system of teaching methods. The objective of the research was to evaluate the extent to which students are benefited by teaching methods. Another purpose was to obtain the views and suggestions of students about various aspects of the current medical education.

Total 337 participants were selected from 4 semesters for this study. A set of questionnaires were put and directed to choose the appropriate options on a perthelikert scale. The responses were collected and analyzed. 51.83% of the total respondents agreed that topics during normal lectures are interesting, 77.02% stated normal lecture as the most effective method of teaching followed by group discussion 68.02%. 67.07% are of the view that the faculty members are having good communication skill and 62.96% of them found that the faculty members are approachable, 82.83% of the participants agreed that black board teaching as the better mode of teaching, so also 55.87% agreed that audio visual aids as a useful mode of teaching, 56.10% of the participants agreed that the number of practical (clinical) classes should be more than the theory classes. The study concluded that planning for effective faculty development programs is required. These programs are to be tailored to teachers needs about their ability to guide students' learning. The study result will encourage other faculty to work with their students in establishing what the students' preferred and least preferred teaching styles are and the reasons for it [5].

Methods Uses for Medical Student's Evaluation Are

Clinical Simulation

As we all know, medical education is practical and skill based area. Medical education is based on cognitive, psychomotor, and affective domains of learning. Simulation is an important methodology in filling the gap between theory and practical in medical education. Many of reviews indicate that simulation-based medical education can improve knowledge and skills and, increasingly, improve patient outcomes.

Clinical simulation is a systematic process which includes the formation of a case scene and handover to students for further analysis and interpretation.

• **Example:** A 36 years old patient has admitted in the medical ward with the chief complain of abdominal pain,

nausea, lack of appetite, insomnia. The students have to apply his theoretical as well as practical knowledge for the finding of correct diagnosis. The medical student will learn how to communicate with the patient and how to document the information. Some students will undergo with electronic manikin to learn the concept of particular diseases [6].

Simulation is the artificial representation of a complex concept of medical related subjects like anatomy, physiology, medicine, pathology etc. It aims to facilitate learning through observation, reflection, feedback, and practice. It minimize the risk associated with patient. Medical simulation offers numerous potential strategies for comprehensive and practical training, and safer patient care. It is the best way to learn. It promotes experiential and reflective learning. It is also a key strategy to teach crisis resource management skills. Simulation can benefit the individual learner, the multidisciplinary team, and the hospital as a whole [7].

The Simulation and its Uses are Classified Into Five Groups which are

Low-technology: it is not based on technology. It is very low cost dummy. It is useful for the knowledge and to acquire the concept of anatomy, physiology. It impact on psychomotor skills.

Screen-based computer simulators: In this some software are used for training and assessment of clinical symptoms, history taking etc.

Standardized patients: here are some live patients are available in the form of actors. They are trained for particular diseases. It helps to learn students about how to collect history, physical examination, communication skills and attitude of patient.

Complex task trainers: It is computer-based simulators. It is used for complicated procedures like ECG, Ventilator care, CPR, lumbar puncture.

Realistic patient simulators: computer-based mannequins used for high-fidelity replication of complex and high-risk clinical conditions in lifelike settings.

Advantages of Simulation Based Learning

- It relieve the risk of any wrong step.
- Anytime, anywhere students can perform it.
- It enables students to learn the concept of particular procedure.
- Students able to apply skills and knowledge into practice.
- It works as bridge between theory and practical.
- It is expensive.
- It develops interest among students.

Comment [AR11]: There is a lot of confusion between teaching and assessment

Comment [AR12]: These are not the only ones - why have they been selected - any premise?

- Person can develop situation according to her need.
- It eliminates the ethical issues like safety and confidentiality.
- Repeated practice of procedure.

OSCE

An objective structured clinical examination (OSCE) is a modern type of examination and demonstration method often used in medical education courses. It is the multidimensional practical examination of clinical skills, as a tool for assessing clinical competence.

Most medical colleges established the Objective Structured Clinical Examination (OSCE) to evaluate the communication skills of undergraduate medical student. An OSCE consists of several stations with different tasks and aims to simulate real clinical encounters between physician and patient [8].

- **Objective:** Examiners use a checklist for evaluating the students.
- **Structured:** it is well organized plan in which student observe the same problem and perform the same task in the same time.
- **Clinical:** The tasks are representative of those faced in real clinical situation.

OSCE includes various stations like station-1, 2, 3, 4, 5. Each station has some instrument, dummy patient, case file, case study etc. The student has to undergo with each station and perform the procedure as desired by teacher. The time will be fixed for each statement. The key to a successful OSCE/ OSPE is Careful Planning.

The Steps in Planning and Implementing an OSCE/OSPE

- Prepare the clear objective of procedure
 - Identify the Practical aspects like hand washing, weight measuring etc
 - Select the procedure
 - Break into Sub-Tasks
 - Assign marks to each step
 - Setup Stations
 - Conduct after orienting students and examiners
 - Make Notes of the process and review
 - Analyze the results and use the same for student assessment
- **Example:** A client admitted with jaundice in hospital with variety of complaints. Imagine OSCE have 5 stations, Station-1- Do hand washing

Station-2- Interact with patient
 Station-3- Find out instrument help in diagnosis of Jaundice
 Station-4- Perform physical examination for Jaundice
 Station-5- Document the case
 Here a student's has to apply knowledge of anatomy, physiology, pediatric, microbiology etc. It is an effective method of demonstration and examination.

The Basic Steps in Conduction of an OSCE Exam Include

- Identify member of OSCE team
- Find the Skill to be assessed on each station
- Objective marking schemes
- Recruitment and training of the standardized patients.
- Logistics of the examination process (Table 2).

Advantage	Disadvantage
1. Same and common case scenarios for all students	Expensive
2. Availability	Time consuming
3. No harmful and adverse situation happen	Less emotion and verbal comment
4. Ethically approved	Text scenario may not present in real life situation
5. Feedback can be taken from learner	
6. Allows for Recall	
7. Stations can be tailored to level of skill to be assessed	
8. Allows for teaching audit	
9. Allows for demonstration of emergency skills	

Table 2: Advantage and disadvantages of OSCE.

Objective Structured Practical Examinations (OSPE)

It is another method of practical examination and assessment tool.

Conclusion

Assessment and Evaluation are an ongoing process which is the best standard in assessing the overall performance of the student. It helps to achieve the goal of an organization. It helps to determine the lacking point of an institute like poor result, teacher performance etc.

Comment [AR13]: OSPE is a variant of OSCE - Harden

Comment [AR14]: The conclusion does not match the rest of the text

Study concludes that following are the Challenges in 21st Century Education

- How to improve Student Engagement in daily class room
- How to equip students with the 21st-century knowledge, skills and practice
- How to allow continuous improvement in curricula and syllabus
- How to Ensure appropriateness of examinations system
- How to ensure lifelong learning of teacher and students
- How to teach a large class of 100 students in a coaching

References

1. Fitzpatrick JJ (2004) Evaluating teaching effectiveness. *Nursing Education Perspectives* 25(3):109.
2. Owen S (1992) Devising a checklist to evaluate the non-verbal aspects of teaching skills and delivery. *Nurse Education Today* 12(5): 392-395.
3. Gibbs T, Brigden D, Hellenberg D (2014) Assessment and evaluation in medical education, *South African Family Practice* 48(1): 5-7.
4. Le KN, Tam VVY (2007) A survey on effective assessment methods to enhance student learning. *Australasian Journal of Engineering Education* 13(2):13-19.
5. Dash SK, Patro S, Kumar B (2013) Teaching Methods and Its Efficacy An Evaluation by the Students. *Journal of Indian Acad Forensic Med.* 35(4): 321-324.
6. Bland AJ, Topping A, Wood B (2011) A conceptual analysis of simulation as a learning strategy in the education of undergraduate nursing students. *Nurse Educ Today* 31(7): 664-670.
7. Datta R, Upadhyay K, Jaideep C (2012) Simulation and its role in medical education. *Med J Armed Forces India* 68(2): 167-172.
8. Cömert M, Zill J M, Christalle E, Dirmaier J, Härter M, et al. (2016) Assessing Communication Skills of Medical Students in Objective Structured Clinical Examinations (OSCE) - A Systematic Review of Rating Scales. *PLoS ONE* 11(3): e0152717.