REVIEW ARTICLE

OBJECTIVELY STRUCTURED PERFORMANCE EVALUATION – A LEARNING TOOL

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ABSTRACT
The teaching and learning of medical students has always been a complicated process. Even the best of teachers at time may struggle in communicating knowledge and assessing its uptake. Simulated clinical and practical tools have recently gained popularity across the globe. They provide information regarding all the three aspects of assessment namely knowledge, skills and attitude. OSCE was first introduced by Harden in 1975. It encourages deep learning by testing higher cognitive functions. University of Health Sciences Lahore (UHS) modified the OSCE and introduced Objectively Structured Performance Evaluation (OSPE) in 2008. In Pakistan, it is a relatively new assessment method. The aim of OSPE is to make practical examinations fair, objective and standardized in line with Best Evidence Medical Education (BEME) and the local needs. Assessment techniques appear to have an impact on students' study strategies' and influence their performance, that is, "Assessment Drives Learning." Therefore in order to cope with assessments, students adapt different learning styles, viz., Deep Approach (DA), Surface Apathetic Approach (SAA) and Strategic Approach (SA). OSPE assesses students' knowledge, different skills and attitude at the same time, therefore, leads the students to read the subject widely and to practice clinical skills extensively. It helps students not to just remember theory but also helps them to critically reflect on their learning course and its outcomes, therefore covering not only the cognitive but also effective domains. The aim of this paper is to review the impact of OSPE on students learning i.e. OSPE as a learning tool. Literature has been reviewed extensively using Pubmed Medline, Paknet, Mediscape and Google Socratic. Review of literature has shown OSPE is a valuable learning tool.

Key words: Assessment, OSPE, OSCE, learning approaches.

INTRODUCTION

The teaching and learning of medical students has always been a complicated process, At times even the best of teachers may struggle in communicating knowledge and assessing its uptake. Assessment of gained knowledge is probably more difficult than delivering it. Assessment of clinical skills is far more important and complex as it directly link with patients care. The aim of this paper is to review the impact of OSPE on students learning i.e. OSPE as a learning tool. Literature has been reviewed extensively using Pubmed Medline, Paknet, Mediscape and Google Socratic.

What is assessment?

Students' assessment, either formative or summative has always been of great interest to medical teachers, both at undergraduate and postgraduate level. It is considered as a part and parcel of their regular on-going teaching and learning activities. The assessment was first introduced during the times of Hippocrates; they used to assess cognitive, affective and psychomotor domains of students (Newble, 1998).

Standardized test was first time introduced by Ancient China in 605 AD by Sui Dynasty, with the aim to select the candidates for Government jobs (Earl, Lorna, 2003). A standardized test is a type of examination which is well – organized and scored in a persistent way to confirm reliability and validity. (Black and Wiliam, 1998) Later on this examination system was adopted by England in 1806 to select particular candidates for posts in Her Majesty's Civil Service. Afterwards this examination system was introduced and applied to different fields of education and spread worldwide and become a benchmark of providing standardized tests (Wikipedia, 2014).

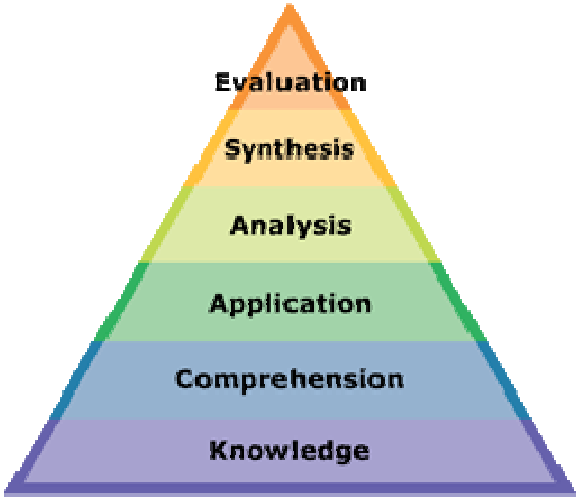
Later in 1956 Bloom gave the scientific explanation of assessment. During the three eras from 1965 to 1995 a tremendous work had been carried out in field of education to introduce new and innovative methods of students' assessment with major emphasis on acquisition of skills (John, Turner, Marry, Dankoski 2008). During these eras Miller introduced pyramid of educational objective (Miller,1990), which in conjunction with Bloom's taxonomy for cognition (Bloom, 1956) provided the basic frame work for scaffolding the new educational system in field of medicine in 1990s. This

revolutionized the medical education to competency and skill based education.

The assessment is the procedure through which teachers analyse whether the educational outcomes of any particular course are achieved or not.

The main objective of the assessment is:

- To increase students' learning.



Bloom's Taxonomy

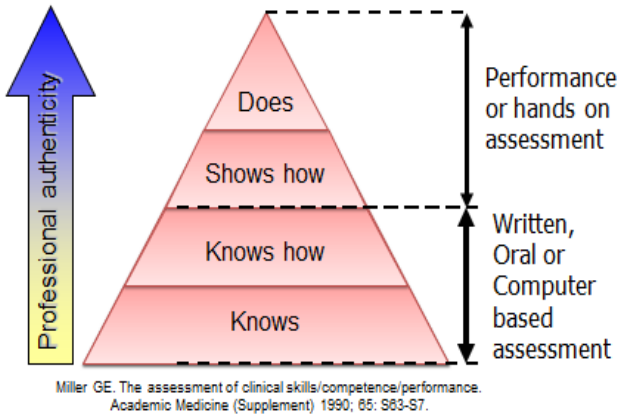
- To certify and evaluate students' level of competency and to produce knowledgeable physicians who can deliver superior quality care.
- To guide medical educationists to find weaknesses and shortcomings in students' education, learning strategies, course content, teaching methodologies, curriculum analysis and assessment outcomes in term of students and professional, so that they can reflect over it and propose ways to overcome these deficiencies. (Amin, 2007).

Medical educationists' are trying to find the new and more reliable means of assessing students' knowledge, clinical skills and competencies.

Knowledge, skills and attitude are three main pillars of Medical education. The assessment methods should be able to assessall the three elements, rather than limited to only one ofthese components. So far the different methods of assessment have been tried to assess the effectiveness and comprehensiveness of the educational as well as clinical training provided to the students.

An ideal assessment method is reliable, valid, cost effective, feasible / practical and acceptable to students, teachers and has good educational impact. No single method of assessment is ideal; every method of assessment has some strengths and weaknesses. Especially conventional practical and clinical examination method is associated with a number of problems in terms of validity and reliability. In conventional method the students' scores are likely to be affected by the type of patient and examiner (Mondal, Sarkar, Nandi, Hazra, 2012). As in long cases; some patients are bad in giving history or are uncooperative, while some examiners like to ask tricky or rare questions in oral viva. Moreover, marks given by the examiner show the overall performance of student and are not a true representative of student's attitude and clinical competence, for example clinical skills are best assessed by asking students to perform them, while in conventional method the examiners give more importance to final score or result and do not concentrate on performance of skill or procedure by the students. Therefore no significant feedback regarding their performance can be given to them (Ananthakrishnan, 1993). Moreover in conventional method variability of patients and variability of examiners for group of students' or class studying the same subject make such assessment invalid.

The valid assessment should be straightforward, should focus on the 'must know' and 'must be able to do' (Miller, 1990).



(Wass, 2010)

What is Objective Structured Clinical Examination (OSCE)?

On the basis of these problems associated with practical and clinical examination especially in terms of their outcome (Azeem, 2007), medical educationists have been trying to cultivate a method which should be objective, reliable, valid, with little or no examiner bias, accepted by students and stakeholders and is able to measure outcome competencies and skills in a better way. Therefore a need for the development of an assessment method that can improve students' learning, performance and competences has arisen (Pertusa et al, 1987, Newble, Entwistle, 1986). This has led to the development of Objective Structured Clinical Examination (OSCE). It was first started in 1975 by Harden (Newble, 2004). Harden and his group in 1979

from Dundee described the OSCE examination system in detail. Initially it was adopted by North American medical schools, then by the 90s it was widely adopted in the UK as well. In 1985 in Ottawa worldwide views regarding OSCE was shared in international conference (Hart, Honden, Walton, 1985). Now it is extensively used as a clinical skill assessment tool in different medical schools of different countries (Singh, 2008, Sloan, Donelly, Scwartz, Strodel, 1995).

In 1988 Harden introduced the OSCE as "a structured approach to assess the clinical competence of the students, in which the different elements of competence are evaluated in an organized or planned way". The OSCE helps to remove the bias and subjectivity that may be there in other forms of assessment.

The OSCE as an assessment tool is quite flexible (Harden 1975); therefore it could be adopted according to the competencies that are needed to be assessed in the candidates (Epstein, 2007). The OSCE permits range of diversity which helps effective judgement of candidates' abilities. Therefore, there is no doubt that the OSCE is a very valuable and useful assessment method and should be used intelligently.

Since the introduction of OSCE, it has been extensively used worldwide for formative as well as summative assessment of students for different clinical and basic disciplines of medicine (Carroccio, Englander, 2000, Harden, 1980). OSCE is an integrated way of measuring skills based learning outcomes. It encourages deep learning by testing higher cognitive functions (Alinier, 2003).

What is TOACS?

In many countries the OSCE is modified and has given different names like OSPE, TOACS etc. In Pakistan, in 1990, the College of Physicians and Surgeons Pakistan (CPSP) introduced the "Task Oriented Assessment of Clinical Skills (TOACS)" a modified version of OSCE in its postgraduate examinations (Siddique, 2012), in order to address the above said problems associated with conventional methods of assessment.CPSP included structured Viva in OSCE and converted it to TOACS. It was first introduced by a medical educationist from Australia. TOACS assess application of knowledge, communication skills, clinical reasoning skills, procedural skills and attitudes.

TOACS is objective, valid, reliable, and feasible and has better educational impact (Hassan, 2012). It consists of ten to fifteen stations with structured clinical tasks, eight interactive stations and seven static stations. The students spend five to six minutes at each station with a minute provided for changeover time. At the interactive stations, there are patients or the clinical material on which competences are tested. On static stations candidates are given some laboratory data, imaging results or some clinical patient problem.

What is OSPE?

Later on, University of Health Sciences Lahore (UHS) modified the OSCE and introduced Objective Structured Performance Evaluation (OSPE) in 2008, in almost all the subject of MBBS and BDS including Obstetrics and Gynaecology for under-graduate medical examination (News by admin, 2008). UHS is a well-known Medical University established in 2002. UHS is responsible for looking after medical education in the Punjab province of Pakistan, according to the charter of the university. It is one of the first universities of its kind in government sector of Pakistan for medical and allied subjects and it has a licence to affiliate all private and public sectors, dental, medical and Allied Health Sciences Institutes (Khan, Biggs, Mubbashar, 2011). UHS is responsible for designing curriculum, to define syllabus, to determine course content, to hold examinations and to award degrees to the graduates. The curriculum proposed by the university is uniform in all institutes however they can make some changes according to their local requirements. Therefore affiliated colleges are responsible for preparing the students according to the defined parameters of the university and are held accountable to maintain the standards as prescribed by the university. This helps to maintain the quality of medical education in medical, dental and other institutes affiliated with university.The university is making innovative changes in teaching and learning practices as well as striving hard to upgrade assessment tools, which can benefit the society by producing competent, skilful, patient and community oriented doctors (Mukhopadhyay, Smith, 2010, Frankel, Eddins-Folensbee, Inui, 2011). Therefore OSPE has been introduced by the university first time in the province of Punjab (Khan, Biggs, Mubbashar, 2011).

OSPE replaced the table viva in the oral and clinical examinations. OSPE, as an assessment tool is not implemented in all medical institutions in Pakistan. It is conducted only in UHS affiliated medical colleges and not even in all subjects. However, UHS is gradually introducing it in other specialities as well.

Following the introduction of OSPE it has become the major part of the practical examinations in each class, from first year to final year undergraduate and post graduate.

The aim of OSPE is to make practical examinations fair, objective and standardized in line with Best Evidence Medical Education (BEME) and the local needs.

Objectives of OSPE

- To test factual knowledge.
- To assess clinical competence.
- To demonstrate common sense.
- To asses analytical thinking and communication skills.

Features of OSPE

OSPE comprises of numerous short duration stations where the students are tested for various clinical skills, (such as history taking, clinical examination of a system, counselling or communication skills, problem – solving skills related to patients scenarios, carrying out a procedure, laboratory report / data analysis, interpretation of X-rays, imaging material concerned with the patients), knowledge and attitude in an objective fashion. In this way almost all areas of the syllabus are covered. This format of assessment leads to the organised and structured experience of the students to a wide range of different clinical skills in a relatively shorter time period. It is designed to expose the candidates to a greater number of examiners and topics and also to reduce the effect that any one examiner has on the candidate's score, thus making the system more structured and organised. It gives them a clear idea of their strengths and weaknesses in various aspects of the subject.

OSPE stations are both static (unobserved) and interactive (observed). Station is of five minutes duration with a minute for station change.

OSPE has made the exam more homogenous by:

- Having the same questions for all students on the same day leading to standardization.
- Removal of the examiner's bias.
- Ability to face different examiners.
- It tests an extensive range of clinical skills and therefore helps in decreasing the sampling error.
- It greatly helps to improve the consistency and reliability in the assessment system.

A standardised predesigned marking check list is used to assess student's performance.

As an example the OSPE structure in subject of Obstetrics and Gynaecology is tabulated below.

Format of the OSPE in subject of Obstetrics and Gynaecology

- Total stations are 20 (05 rest stations).
- 05 min at each station.
- 05 marks for each station.

Types of station

I. Unobserved / static stations.
II. Observed / interactive stations.

Description of type of stations

- Unobserved / Static station.
- Observed / Interactive with examiner.
- Rest station.

Unobserved / Static Stations

These are the stations where the candidate has to read the instructions and answer accordingly on the response sheet. On these stations a scenario with question, some instrument for identification with relevant questions, a photograph, a partogram, CTG, Lab report or a drug with questions can be given.

Observed Station / Interactive with examiner

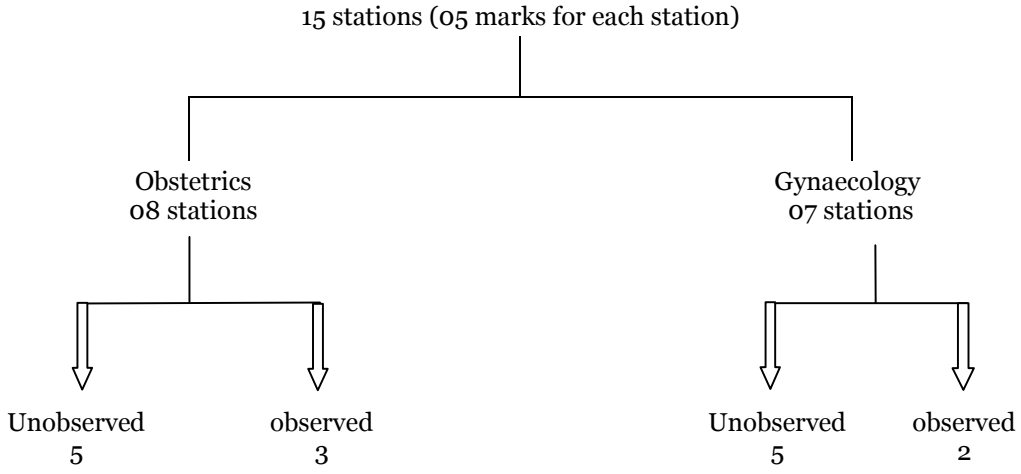
These are the stations where the candidate has to give the answer to the questions asked by the examiner and rarely role play as well. The examiner marks the candidate according to the award sheet. There may be a scenario and examiner will ask the questions regarding that or the candidate may be asked to perform some task like general physical examination / abdominal examination, IUCD insertion, demonstration of breech delivery, normal vaginal delivery or counselling e.g. regarding intrauterine foetal death, some disease or breaking some bad news, etc.

Rest Station

At these stations candidate are not assessed, they sit and organize themselves for further stations.

Preparation of OSPE

In UHS, OSPE is carefully structured to cover the whole syllabus. It is designed by trained examiners. UHS



Differences in conventional practical examination and OSPE.

OSPE Assessment System		*Conventional Methods of VIVA and Practical*	
1.	Cover a 90% topic content studied in whole year	1.	Only 30 to 47% of content covered through this test
2.	Questions are highly structured (same questions for every one)	2.	Questions are not structured (different students get different questions)
3.	Total 15 stations for rotation, each station is of five minute duration, some are static need written answer, some have examiner asking structured questions. The answers are documented and marked according to predesigned checklist	3.	Only two sets of examiner, sometime maximum four, , questioning unstructured questions according to their own wish and will, no limitation of time and depending upon their perception fail or pass the candidate, moreover no documentation of candidate answer
4.	In minimum time maximum number of students cover major topics in a transparent way	4.	More time to examine students, without any transparency and only cover topics of examiners choice
5.	The students' needs to prepare the entire subject therefore, become more knowledgeable	5.	The students prepare selected topic of every subject therefore, less knowledgeable
6.	It is students friendly, not making them nervous	6.	It is not student friendly putting them in stress.

provides the OSPE station in a sealed envelope with a checklist for observed stations for objective rating of the candidate. For any particular day of examination the same set of OSPE is sent to all centres and the examination started at the same time to maintain standardization.

Problems of OSPE

There are certain set of problems that can be encountered while conducting OSPEs:

- OSPE in Pakistan is usually carried out in wards both for formative and summative assessment for which wide space is required to arrange stations at a reasonable distance. Moreover, extra chairs, tables and other logistics are needed to arrange the OSPE circuit.
- The OSPE needs a number of examiners at different stations, while there are a limited number of consultants in each unit, so some institutions need to involve senior postgraduate trainees as examiner for formative assessments. In addition, the OSPE needs simulated patients or role players which are not available in Pakistan so some units engage house officers or junior doctors for this purpose. Therefore, on the day of OSPE most of the ward doctors become busy with conducting OSPE, which in turn may compromise ward work on that particular day.
- Creating an OSPE station with candidate's instructions, examiner's instructions and a marking key needs extra time and hard work. Therefore, doctors of various postgraduate years can be trained and involved for making OSPE stations to generate a pool of stations.

Turner and Dankoski (2008) also pointed out similar set of problems regarding implementation of OSPE. There is a high cost in terms of resources, personnels, facilities, time and finances for examiners, simulated patients, and examinees. Moreover, the resource requirement includes recruitment and training of Simulated Patients, training of faculty and more space to administer the test.

Impact of OSPE on students learning approaches

The learning of students revolves around the triad of learning objectives, teaching or instruction methods used and assessment taken (Shafique A 2013). Various techniques of assessment appear to have a considerable influence on the students' learning approaches / styles, which shows "Assessment Drives Learning" (Fowel, Bligh, 1998). It means students try to learn in a way, they are liable to be assessed on. An assessment that is responsible for providing energy and motivation provides meaning and direction to learning as well as teaching; defines teaching strategies / practices that help in changing perception and attitudes towards medical education and influence students' approach to learning. Therefore in order to cope with assessments students adapt different learning approaches.

The aim of teaching is to promote learning and to motivate the students to learn more efficiently. The knowledge regarding students' approaches to learning can be helpful to both students and teachers. The knowledge regarding students approaches to learning help teachers to find the ways through which they can make students enthusiastic about the subject, to give due importance to it and being able to cope with it. It helps teachers to tailor their teaching according to the different learning approaches of the students (Samarakoon

2013).

Similarly, those students who have knowledge about their approaches to learning will be able to find and use those techniquesthat suites best to their personal styles, leading to greater satisfaction in terms of teaching and learning.

OSPE as an assessment tool also influences the students approach to learning. OSPE covers a wide range of knowledge and subject therefore with the induction of OSPE, students need to study the subject more thoroughly and in depth in order to pass through this examination.

According to Ozuah, Curtis and Dinkevich (2001); "Teaching to the test" is a common phenomenon and as in OSCE students are tested for their clinical skills, therefore OSCE / OSPE, leads to enhanced clinical skills training, better students' performance and improved teaching methodologies following faculty feedback by students. Moreover OSPE increases student's confidence and allays anxiety about the upcoming annual examination.

Approaches to learning

Approaches regarding learning are different from learning styles. Learning approaches cannot beconsidered as personality traits that are inherited rather they are inculcated in the students through their interaction with particular learning tasks (Laurillard, 1979). Depending upon the nature of a particular task student can use different approach for learning (Biggs, 1999).

Students are not considered as a homogenous group of individuals. Rather they achieve their learning targets by using different approaches. In addition to this, how and what make them to learn does not merely depend upon their personal preferences, skills or aptitudes. Nonetheless learning environment alsoplays an important role (Fabry et al, 2012).

Students' approaches to learning are not commonly stable traits. An approach varies according to the content and context. For example, a student may take a surface approach to learning for anatomy course, or a deep approach in physiology. Therefore students may have different approaches to learning.

The three diverse approaches to learning that have been provided below:

- Deep approach to learning (DA).
- Surface approach to learning (SAA).
- Strategic approach to learning (SA). (Leite, Svinicki, 2010).

In 1976 Marton and Saljo carried out innovative work on learning approaches. Then in 1999 Biggs defined that students learning approaches have two constituents.

- How and what is the underlying strategy of the students to approach the task?
- Why and what motivated the students to approach it?

Some students learn things only after understanding the subject, some learn through rote learning or memorization and regurgitating remembered information, or by an amalgamation of these different methods to variable degrees (Marton, Saljo, 1976).

Depending upon learning approaches, students can be categorized as unimodal if their learning approach is predominantly of single type and multimodal if they are found to have mixture of two or more than two learning approaches (Tait, Entwistle, 1998).

Characteristics of deep approach:

- Deep approach is an organized approach where students try to understand concepts and relating ideas.
- They examine new ideas and facts critically, associate them with prevailing knowledge.
- They attempt to develop meaningful link between different ideas, therefore interacting actively with full mental engagement while doing academic work.
- They are looking for relationship between ideas
- Students attempt to make usage of evidence, analysis and evaluation.
- Students not only take interest in the subject but actually try to study and read beyond the actual requirements of the course.
- Students spend lot of time to understand key concept.
- Content of the course linked to real life.
- Students needs to be engaged in active learning.

Superficial apathetic approach characteristics:

- In superficial approach students try to cover syllabus by superficial learning with emphasis on rote memorization.
- Students receive information passively.
- They seldom engage in reflection.
- They try to cover the syllabus at the expense of in depth understanding of subject.
- They rush to cover large amount of the material.
- They are less likely to make connections between ideas.
- They fail to distinguish principles from examples.
- They are unable to correlate new knowledge with previous one.
- They take contents of course merely as something to be knowledgeable to pass the assessment and are not much interested in the subject.
- They focus less on academic achievements, but concentrate on others things like sports etc.

Characteristics of strategic approach

- While in strategic approach, students aim for achieving highest possible grades, either by using superficial or deep approach in accordance to any

particular topic.
- This sort of learning leads to patchy understanding of substance matter which results in poor integration of topics as well as lack of knowledge.
- Strategic approach is characterized by alertness to monitoring as well as assessment (Leite, Svinicki, 2010). That is students try to prepare subject according to the requirements of the exam and they wisely use the material to get through the exam.
- They use previous examination papers to predict questions.
- They organize their time and distribute their efforts to attain maximum scores.
- May use both deep and surface approaches.
- When this approach is used along with deep approach it may give an intelligent engagement to get through exam.

Factors influencing students' approaches to learning (lubin, 2003)
A number of factors which influence students' approaches to learning are provided below:
- Workload.
- Learning objectives.
- Teaching.
- Choice.
- Student's support.
- Assessment.

Workload
Increase in workload such as excessive reading material, increased working hours, part-time jobs and extensive teaching by teachers pushes the students to adopt surface learning approach to overcome time constraints and to meet deadlines. Therefore in order to avoid workload, facilitation of student learning can be done by teachers in such a that they can restrict their content of lecture to those topics that are essential, and leave remaining on disposal of students. So that they can explore the subject matter themselves to track the content of lecture and to get through it, thus encouraging them to be accountable and responsible for their own learning independently. The intention is to encourage them to develop deep approach to learning.

Learning objectives
Students are encouraged to adopt a deep approach in the subject when they are subjected to higher order objectives for example learning objectives that include verbs like analyse, solve, justify, apply, reflect etc. need in depth understanding of subject.

Teaching
Teaching methodologies are likely to have a strong influence on students approaches to learning, e.g. if students are involved in problem based learning, collaborative / group learning or project based learning, this will encourage deep approach to learningin that particular subject. So deep approach to learning in the subject is likely to be encouraged by the type of teaching that involves students in independent and active learning. So teachers should be trained to teach in such a way that helps students to be engaged in depth learning of the subject. Which in turn leads to better doctors of tomorrow?

Choice
When students adopt the subject of their own choice, they are more interested to read it. Interest leads to motivation and involvement, which facilitates deep approach to learning.

Student support
Students who have better support during academic years either from their teachers or seniors tend to have better in-depth understanding of subject as compared to those who lack such support.

Assessments
Assessments have powerful impact on students approaches to learning, therefore if an assessment is regarding just recall of information students will be likely to adopt superficial approach, but if assessment is regarding application of knowledge or regarding assessment of higher order cognitive skills, then it will lead the students to study the subject in depth. Similarly if there are too frequent assessments it will lead the students to be involved in superficial learning as the main focus of the students will be to clear the examinations by memorization of facts. But if the assessments are fewer and engage students in problem solving, will lead to deep approach to learning.

Same is the case with OSPE. OSPE assesses students' knowledge, different skills and attitude at the same time, so in order to cope with this, students need to read the subject wisely as well as they need to practice clinical skills on patients and in skill lab which in turn foster their learning. This in turn has significant effect on students' approaches to learning.
- OSPE has had a positive effect on curriculum moreover this assessment method has a direct impact on students' learning behaviour by increasing students' learning. The stations are diversified; therefore a vast knowledge is tested in shorter time that leads students to study subjects in depth.
- It not only helps students to remember theory but also give them the confidence to critically evaluate novel information and encourage them to recognize their own shortcomings in knowledge, skills and attitudes. It also helps them to critically reflect on their learning course and its outcomes, therefore covering not only the cognitive but also effec-

tive domains (Kowlowitz et al, 1991).

- Moreover it helps students to develop skill to remain consistent, analytical, motivated and methodical; in addition it helps to attain problem solving approach. This leads learners to construct their new knowledge and skills on their previous one, facilitating them to make judgment regarding how and when to modify construction of knowledge, thus leading to in-depth study of the subject.

CONCLUSION

The evidence suggests that OSPE is a valuable assessment tool with a significant educational impact. It not only helps to assess the cognitive basis of Blooms taxonomy but also evaluate the attitude of skills of the students in an organized way.

However, successful OSPE is usually the result of planning and coordination of multiple resources, commitment to large scale and thoughtful use and practice of assessment data in order to achieve the maximum intended benefits of OSPE as educational assessment tool.

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