

**NURSING STUDENTS' AND LECTURERS' PERSPECTIVES OF OSCE,
INCORPORATING SIMULATION**

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ABSTRACT

Objective Structured Clinical Examination (OSCE) has been widely and increasingly used since it was developed. Research has shown that it is an effective evaluation tool to assess practical skills (Sloan et al. 1995). In many instances the OSCE process has been adapted to test trainees from different health care related disciplines. In nursing education, as presented in this paper, principles of OSCE can also be used in a formative way to enhance skill acquisition through simulation. The aim of this approach to teaching is safely to help students gain more confidence when confronted by technical instruments present in the hospital environment, and to encourage them to reflect on a range of skills and competences they need to acquire. The OSCE stations can be designed in the form of small scenarios where students have to set-up or interact with technical instruments, or communicate with patients. This type of simulation exercise can be varied as a whole and specifically within each station at the same time. The use of this hybrid formative OSCE is being assessed by nursing students and lecturers. The feedback received regarding this teaching method and the results of this study are useful and show that OSCE are favourably perceived.

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INTRODUCTION

A review from Miller (1990) on the assessment of clinical skills, competence and performance, raises an interesting point concerning the performance and action components of future graduates. According to Miller, examinations

should be designed so as to test students in conditions closely related to their future professional function. The pyramid, or triangle (Figure 1) Miller used for illustrative purposes shows the different skills stages that trainees should be able to demonstrate. “Faculties should seek both instructional methods and evaluation procedure that fall in the upper reaches of this triangle” (Miller 1990, p.63). It would have for an outcome that students are better prepared for their future role. The Objective Structured Clinical Examination (OSCE) was originally developed in Dundee in the mid-seventies (Harden & Gleeson 1979). Harden and Gleeson had the idea of creating this test to assess clinical competences of trainee doctors by making them individually rotate through a number of “stations” where they are assessed individually using precise sets of criteria in the form of a checklist. Since then, many publications have greeted its use as a means of objectively assessing students’ skills across healthcare disciplines such as physiotherapy, radiography and dentistry (Hulett & Gilder 1986, Marshall & Harris 2000, Mossey et al. 2001). This type of session requires careful organisation and planning for the event to be successful (Harden 1990). Yet the aim of this paper is to promote the value and use of OSCEs in nursing and other disciplines as a formative teaching tool by presenting the results of a study that was conducted at the University of Hertfordshire.

Figure 1

DEFINITION OF AN OSCE

Normally an Objective Structured Clinical Examination is composed of fifteen to twenty short exercises or stations through which students rotate individually. The number of candidates taking part in the session is determined by the number of stations. Several sessions are often required to examine large groups of students. Each OSCE station is normally allocated the same amount of time. The assessment period usually last between 3 to 10 minutes and can be alternated with short rotation intervals so students have time to move to the following exercise. Each station relates to one or more particular skill associated with the subject area. Stations can either be practical and invigilated by an examiner, or theoretical, in the form of an unsupervised pen and paper exercise. In either case, students have to wait for a signal marking the end of the period before rotating to the next station and starting a new task. By the end of the OSCE all the students will have gone through each station and been marked according to a checklist, which makes the overall examination based on objective judgements. Theoretical stations are marked in a similar way after the session.

Those few points oblige us to acknowledge that designing effective OSCE sessions and appropriate stations can be complex and resource intensive. Yet it still needs to be considered as a valuable and beneficial experience for the students. Kowlowitz et al. (1991) mentioned that OSCE has had a positive effect on their curriculum. One has to keep in mind that the assessment

method directs the students' learning behaviour, so it is expected that OSCE increases student learning. Because the stations can be diversified, it can help students to improve different skills as well as their confidence.

BACKGROUND OF THE STUDY

The Hertfordshire Intensive Care & Emergency Simulation Centre (HICESC), a specialised teaching laboratory at the University of Hertfordshire, has been using a 15-station OSCE in the context of a research project funded by the British Heart Foundation (Project number: Edcomm/Oct98/9d) to determine the usefulness of intermediate fidelity simulation in undergraduate nursing education. This assessment is being used to test nursing students' skills at two different stages in their course curriculum. They are initially tested toward the middle of their second year, then at the start of their third year of their diploma course. The session relies on voluntary participation of the students and operates in a formative way under examination conditions (See paragraph: *Implementing OSCE in different ways* and Table 3: Mixed mode). Students are encouraged to go to the sessions for the educational experience and by being rewarded with a certificate of attendance to enhance their professional development portfolio.

To gather more information about how people view the session, two questionnaires have been designed. The first questionnaire was aimed at collecting information from the students (n = 86) from two nursing cohorts who

took part in the sessions. One of the cohorts was doing the OSCE for the first time (30 volunteer students) whereas the other cohort was repeating the Objective Structured Clinical Examination for the second time (56 volunteer students) after a six-month gap. The second questionnaire was distributed to the lecturers (n = 39) who have assessed student skills during the OSCE sessions.

THE STUDENT AND LECTURERS PERSPECTIVE OF OSCE

So as not to influence the candidates' response the two types of questionnaire were anonymous. The students' questionnaires were distributed and collected at the end of the session, whereas the staff questionnaires were sent and received through the University internal mail. The results obtained from the 86 students and 39 lecturers are respectively presented in Table 1 and Table 2. The statistical analysis of the feedback collected was performed using SPSS, a powerful and comprehensive statistical software package. The results proved more positive than expected from both parts. According to the information collected the "mixed mode" OSCE sessions were generally appreciated by students and examiners, who rated them respectively with means of 1.58 and 1.82 on a five point Likert scale (1= very useful, 5= not useful at all). A similar positive feedback was reported by Khattab & Rawlings (2001) concerning the perception of students and examiners of the educational benefits of OSCE as a formative and

summative assessment. In agreement with a study by Hill et al. (1994) which showed that formative assessment should be incorporated into the teaching process, in the present study 96.5% of the students and 94.9% of the examiners also think that those sessions should be incorporated in the nursing curriculum. Students think that the OSCE sessions should take place 3 to 4 times per year (Mean= 3.39), which is slightly more regularly than staff would be willing to support (Mean= 3.03). This difference is due to the time constraints exerted on the assessors and the high student to staff ratio (less than 1.5 to 1) required during the OSCE. Lecturers find the session very informative and useful. It brings together teaching staff from different departments, and who may not be used to work together. The overall session takes place in an unusual educational atmosphere caused by the interactivity of the OSCE and the number of teaching staff and students involved.

Table 1

Table 2

THE NEED FOR MORE PRACTICAL SKILLS TRAINING

Oral comments made by students are very convincing about the importance of giving them more opportunities to get hands-on practice within their

university curriculum. When used in a formative way, most students (93.0%) think the OSCE was beneficial and should be repeated more regularly.

The usefulness in repeating the same OSCE lies in the fact that it enables students to have had time to reflect on their performance and solve any problems they might have with some of the stations. Reflection will engage the students to think about their performance and help them in the future occurrence of a similar experience. "Some benefits of reflection may be lost if they are not linked to action" (Boud et al. 1985). When students do an OSCE for the second time they usually perform to a higher standard.

Students feel they do not have enough practical experience when they qualify, and further research would probably show that they are not fully confident about their own competence and skills. 86.0% of the candidates think the session helped them developing their confidence. As shown in table 1, a comparative analysis of the results from the students of the two individual cohorts does not highlight any significant difference in opinion.

The tasks set in the OSCE and undertaken by the students were very revealing about their current knowledge and familiarity to tackle the different exercises. OSCE examiners also realised the students' lack of skills and confidence in some of the areas assessed. This type of session has been a revelation to many lecturers and has lead most of them (82.1%) to think that students should get more practical skills training sessions. 92.3% of the lecturers who have taken part in the OSCE believe that it can be considered as a practical session.

The overall feeling gathered from the questionnaires was that this type of session should be arranged more regularly but that special dispositions should be taken to make it less staff intensive. Results obtained from the questionnaires seem to verify a comment made by Nicol & Freeth (1998, p.608): "OSCE has the advantage of being viewed as a very worthwhile and highly relevant experience for the students". The role of teaching institutions is to prepare students for their future professional activity. Teaching is about providing students with opportunities to learn so they can gain knowledge and skills (Brown & Atkins 1988). To achieve this educators should endeavour to use the best and most appropriate teaching methods.

OSCE, SIMULATION AND KEY SKILLS

The stations can be designed to address different skills such as problem solving, communication, use of information technology (IT), application of numbers, working with others (Teamwork), and improving own learning and performance in a minimum amount of time. Although those key skills are common across many disciplines, they are often used under different circumstances and this needs to be reflected in the way the stations are prepared. OSCE can include problem-based scenarios asking students to demonstrate their critical thinking abilities. If such stations are included in the session, students should be warned in advance that they are not expected to be familiar with all the exercises they have to go through as it could have an

adverse effect on their confidence. Such a negative feeling could form a major barrier toward learning (Boud et al.1985) and their future participation in another OSCE.

Since the early days of OSCE, simulation was to some extent integrated and used within the examination with standardised patients for example, which uses people who have been trained to act like real patients (Vu & Barrows 1994). A station can often include a short scenario during which students are facing a standardised patient with whom they have to communicate to obtain an accurate patient history or perform a physical examination. OSCE enables students to put evidence-based medicine, which combines knowledge and communication skills, into practice (Bradley & Humphris 1999). It is a very useful process that enables educators to test trainees in the upper reaches of Miller's pyramid (Figure 1) as it places them in a situation that they might encounter in the future. In addition, the use of simulation in this context enables the examiner to identify students' learning and skills deficiencies (Kowlowitz et al. 1991). It also helps students to identify and consider their own learning needs (Townsend et al. 2001). It is a safe way for trainees to practice without putting patients at risk. To improve their skills and confidence, students should be encouraged to reflect on their performance after a session and be given the opportunity to repeat the OSCE after a period of time so the benefits of their reflection can be put into practice.

IMPLEMENTING OSCE IN DIFFERENT WAYS

Despite a few restrictions such as the number of students involved, which usually correspond to the number of stations, the rigidity of the time so that the session runs in a coordinated way, and the large number of qualified people required to observe and assess the students, an OSCE can be viewed as a very adaptable session. There are many ways to incorporate Objective Structured Clinical Examinations in an undergraduate curriculum. OSCE is a tool for teaching as well as for assessment (Kowlowitz et al. 1991). It can be modelled to fit the individuals' needs regardless of the field of study. Their use could be extended beyond the training or assessment of healthcare professionals to areas such as law, chemistry, and engineering. The OSCE could simply be named with the general term OSE (Objective Structured Examination) or according to the area in which they are being applied, for example OSBE for "Objective Structured Business Examination".

Similarly, those sessions can be administered in what I would define as formative, summative or "mixed mode" (Table 3).

Running the session in a formative way with interaction from the assessors helps students getting more familiar with procedures, pieces of equipment, or skills they are performing at the stations. This helps them building their confidence and competence, and will eventually enable them to become more skilful professionals. Students can ask questions to the examiner present at the station at any time if they are not confident about the task to perform. The

examiner, more of a helper in this instance, may or not take notes on what the students are doing to provide an overall feedback at the end of the session.

The summative mode is the original mode of operation of an OSCE as defined by Harden and Gleeson (1979). The role of the examiner is to observe and record the performance of the students on a particular station without helping them.

What is meant by “mixed mode” is to run the session as a summative OSCE, but to save some time before the end of each assessment period to give individual feedback to students and answer their questions. This OSCE mode is very useful to monitor the abilities of individual students as well as to help them improving their skills.

In whatever way the Objective Structured Clinical Examination is used, students should be clearly briefed and informed about the aims and objectives of the session, and whether or not they are expected to be familiar with what they are being tested on (i.e. problem based exercises or practice of skills they should already know). The end of the mixed mode or formative OSCEs should include a discussion and debriefing with the students. It gives them the opportunity to address stations where they did not receive individual feedback from an examiner.

Table 3

DEVELOPING OSCE STATIONS REQUIRES INNOVATION AND CREATIVITY

The greatest advantage of using OSCEs is the flexibility of their individual components: the stations. They can take the form of small scenarios, simulations, case studies, multiple choice questionnaires, short theoretical questions, or even rest stations to help the students relax from time to time. The imagination of the persons developing the OSCE is the only limitation. However, stations need to be fairly focused so that the tasks can be completed within the time frame. Instructions including the points on which students are being assessed or expected to do their best need to be defined clearly for each station. Similarly, assessors need to be precisely briefed about their role and informed of their possible interaction with the students. Depending on the skills assessed, stations can require the use of computer software, specialist pieces of equipment, material or actors (i.e. standardised patients or customers). OSCEs can be used to introduce new materials or concepts to students so they can explore them on their own in the first place. The OSCE would in that case be very similar to a series of problem-based exercises, and in which case students need to be informed of the difficulties they might face. Using OSCE encourages students to improve their own learning and reflection in a safe environment. The sessions need to take place in an appropriate room that can easily accommodate the OSCE. One will have to take into account the number of stations and people involved, the

equipment that needs to be set up, the labelling of the station numbers, instructions and timing system.

CONCLUSION

Although there are a few drawbacks in using OSCEs they should not be neglected. The running cost of the OSCE is outweighed by the educational benefits (Khattab & Rawlings 2001) as well as the students' satisfaction to have learned something useful. The potential of OSCE as a flexible teaching method has been recognised by many lecturers from the University of Hertfordshire and might be used more regularly in several nursing curricula. This provides opportunities for students to use a number of medical pieces of equipment in a safe environment and to become more familiar with them. Using problem-based learning scenarios, students have to employ critical thinking skills related to both the practice and theory of the task they are expected to perform. OSCE can be set up to integrate IT, communication, and critical thinking using simulation. From this it can be suggested that OSCE provide an integrated way of measuring learning outcomes in skills based learning. This has implications for work-based learning. OSCEs encourage a deep approach to learning because higher cognitive functions are tested.

The OSCE sessions not only help students determining their own weaknesses (Sloan et al. 1995), but also enable examiners or lecturers to realise what are the current students' abilities (Kowlowitz et al. 1991). If required additional teaching sessions can be organised to address skills that caused problems to the students during the OSCE. The use of such sessions may well be a key element to the training of better-prepared healthcare professionals. The widespread of hybrid OSCE to other disciplines to teach and assess students on basic skills specific to the different subject of study may well occur in the near future.

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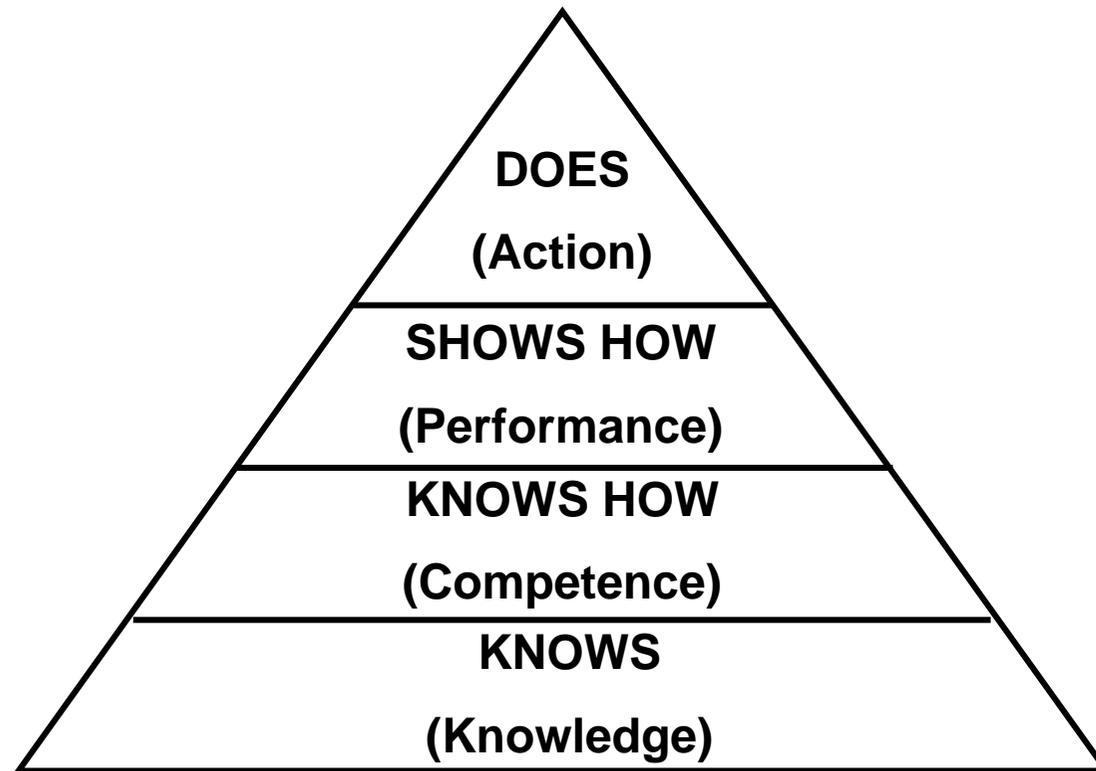


Figure 1: Framework for assessment proposed by Miller, 1990.

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Table 1: Students view of the OSCE sessions.

Questions & Answers	Results obtained from students who have done one OSCE (30)			Results obtained from students who have done two OSCEs (56)			Results from the two student groups (86)		
	Yes	No	Not Valid	Yes	No	Not Valid	Yes	No	Not Valid
Should the OSCE be part of your curriculum?	93.3% (28)	6.7% (2)	0% (0)	98.2% (55)	1.8% (1)	0% (0)	96.5 % (83)	3.5% (3)	0% (0)
Has the OSCE been a beneficial session?	100% (30)	0% (0)	0% (0)	89.3% (50)	10.7% (6)	0% (0)	93.0 % (80)	7.0% (6)	0% (0)
Has the OSCE helped you developing your confidence?	80.0% (24)	16.7% (5)	3.3% (1)	89.3% (50)	10.7% (6)	0% (0)	86.0% (74)	12.8% (11)	1.2% (1)
Would you like to repeat OSCE sessions more regularly?	93.3% (28)	6.7% (2)	0% (0)	92.9% (52)	5.4% (3)	1.8% (1)	93.0 % (80)	5.8% (5)	1.2% (1)
How many times per year would it be useful to repeat the OSCE?	Quartiles 3.21 (2-4[1-6])** Standard deviation 1.52 (29 valid)			Quartiles 3.48 (2-4 [0-6])** Standard deviation 1.51 (55 valid)			Quartiles 3.39 (2-4 [0-6])** Standard deviation 1.51 (84 valid)		
How would you rate the OSCE session? *	Quartiles 1.59 (1-2[1-3])** Standard deviation 0.57 (29 valid)			Quartiles 1.57 (1-2 [1-4])** Standard deviation 0.76 (56 valid)			Quartiles 1.58 (1-2 [1-4])** Standard deviation 0.70 (85 valid)		

* Rating with a Likert scale (1= very useful, 5= not useful at all)

** Mean (lower quartile-upper quartile [lowest-highest])

Table 2: Assessors view of the OSCE sessions.

Questions & Answers	Yes	No	Not Valid
Should the OSCE be part of the nursing curriculum?	94.9% (37)	2.6% (1)	2.6% (1)
Is the OSCE a beneficial session for the students?	94.9% (37)	0% (0)	5.1% (2)
Does the OSCE help the students developing their confidence?	94.9% (37)	5.1% (2)	0% (0)
Could the OSCE be considered as a practical session for the students?	92.3% (36)	2.6% (1)	5.1% (2)
Would you like the students to be able to take part to those sessions more regularly?	94.9% (37)	2.6% (1)	2.6% (1)
Students should get more practical skills training sessions at the university?	82.1% (32)	12.8% (5)	5.1% (2)
Could the OSCE be considered as a practical skills training session?	92.3% (36)	2.6% (1)	5.1% (2)
How many times per year would it be useful to repeat the OSCE?	Quartiles : 3.03 (2-4 [1-6])** Standard deviation: 1.45 (34 valid)		
How would you rate the OSCE session? *	Quartiles: 1.82(1-2 [1-4])** Standard deviation: 0.82 (39 valid)		

* Rating with a Likert scale (1= very useful, 5= not useful at all)

** Mean (lower quartile-upper quartile [lowest-highest])

Table 3: Different OSCE delivery modes: summative assessment, “mixed mode” and formative assessment

OSCE: Summative Assessment

	Station 1	Rotation Gap 1 min	Station 2	Rotation Gap 1 min	Station X
Examiners	👁️ 👂 ✍️		None		...
Time	5 min		5 min		...
Information	↑ (↕)		↑		...
Students	👋 👁️ 👂 👄 🗣️	✍️ 👁️	...		

OSCE: Mixed Mode

	Station 1		Rotation Gap 1 min	Station 2	Rotation Gap 1 min	Station X
Examiners	👁️ 👂 ✍️	👄 🗣️		None		...
Time	4 min	1 min		5 min		...
Information	↑	↕		↑		...
Students	👋 👁️ 👂 👄 🗣️		✍️ 👁️	...		

Overall feedback at the end of the session, including about theoretical stations

OSCE: Formative Assessment

	Station 1	Rotation Gap 1 min	Station 2	Rotation Gap 1 min	Station X
Examiners	👁️ 👂 👄 🗣️ (✍️)		None		...
Time	5 min		5 min		...
Information	↑ and ↕		↑		...
Students	👋 👁️ 👂 👄 🗣️	✍️ 👁️	...		

- 👋 : Doing
- 👁️ : Observing
- 👂 : Listening
- 👄 🗣️ : Answering questions, explaining or commenting
- ✍️ : Marking, taking notes, or writing answers
- ↑ : One-way communication between student and examiner (Oral or written)
- ↕ : Two-way communication between student and examiner
- () : Only if required by exercise undertaken.

Example illustrating two stations of an OSCE with a 5-minute assessment period followed by a 1-minute rotation gap to give time for the examiner to reset the station and for students to get to the following one. Students would need to demonstrate a specific skill on station 1, whereas station 2 would correspond to a theoretical station, related or not to the previous station, where students would have to answer one or several questions.