

Suggesting Objective Structured Practical Exam Format for Structuring the Embryology and Genetics Practical Exam of the M Phil Anatomy Course

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Abstract

Objective: To suggest an objective structured practical exam (OSPE) format to be followed by the examiners in the practical exam of the 'Embryology & Genetics' paper.

Study design: The study was a descriptive one, having both qualitative and quantitative elements.

Place & Period of Study: The study was carried out in the Department of Anatomy, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, from January 2004 to June 2005.

Method: It was based on analyses of data from questionnaire based study and from focus group discussion (FGD). The questionnaire was distributed to all the postgraduate anatomists (sixty) all over the country excepting eleven who were participated in focus group discussion. Data were analyzed both qualitatively and quantitatively.

Result: Most anatomists of Bangladesh approve the suggesting OSPE format for the improvement of structuring of the practical exam.

Conclusion: Incorporation of the findings of the present study with the modern ideas in the practical exam, the suggesting OSPE format would be helpful for the examiners and if it is used in the practical exam, it will be more reliable and valid than the traditional method.

Key words: Practical exam, Embryology and Genetics

Introduction:

Proper implementation of the assessment exams based on organized documents can make the course meaningful. From 2001, the Anatomy department of Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka has been conducting the oral and practical exams through a semi-structured system. There is a card (format) for the

oral and practical exams that guides the examiners in running the exam in terms of course contents in groups, in terms of topics and exam materials (tools like viscera, skeleton, models etc.). However, no objective structured practical examination (OSPE) is in practice. Therefore, a 'spotting' exam is in practice in which mostly biased short answer questions are asked in relation to materials like specimens of viscera and bones as well as figures and models. It is also observed that no organized OSPE format is available as a guide.

It is expected, therefore, that the M Phil practical exam would be properly 'structured', and the document related to the practical exam be updated according to the modern understanding of the science of assessment in medical education. This would mean that the basic plan and detailed

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organization of the practical exam would be as perfect as feasible in terms of:

- Reflection of the objectives of the course and of the paper
- Validity, reliability and objectivity of the test.
- Functional and clinical relevance
- Logic of the use of different exam materials
- Practicability of time allocation

Traditional practical examination: In traditional practical examination, a student performs experiments or some other practical procedures in the absence of an examiner and towards the end of the prescribed time the examiner appears to examine the candidate by carrying out a bench viva-voce examination. In most of the cases questions on theoretical knowledge dominate the scene. Such situations are not uncommon in M Phil exams of institutions where structuring has not been tried. Sometimes, 'spotting' – type exams end up in simplest identification followed by theoretical questions.

Paul¹ has identified the following problems associated with the traditional practical assessment system:

- a) Insufficient sampling of course content
- b) Inadequate emphasis on practical skills (which decreases validity)
- c) Undue emphasis on recall of facts, rather than higher domains such as problem solving
- d) Inadequately linked objectives of training, and learning experiences offered to students
- e) Poor reliability and objectivity
- f) Inadequate emphasis on attitudes and communication skills

Objective structured practical examination (OSPE)

The structured practical examination is essentially an administrative structure into which a variety of test methods can be incorporated. The aim is to test a wide range of skills in an objective fashion². OSPE is designed in such a way as to get a reasonable idea of the achievement of the student in every objective of practical exercises. Due weightage is given to each objective, and due representation is given to every aspect of the course.

Every student spends 3-5 minutes at each station.

Generally, OSPE stations are of two types:

1. **Procedure stations-** As the name implies, at a procedure station, the student has to perform a procedure and is observed by an observer on the basis of a checklist with specified marking scheme.
2. **Question stations-** In a question station of an OSPE, the student has to answer to questions related to the practical aspects of a subject. The question may be based on a figure, a viscus, a model, skeleton, some data, X-ray, an image (like X-ray film) an instrument etc. The questions should preferably be of the multiple-choice variety. If that is not possible, they may be very specific short answer questions. Specific answer checklist with marking scheme works as the guideline for the examiner. No observer is required.

If there is an organized OSPE format is available in the institute then the examiner can decide in advance what is to be tested and can then design the examination to test these competencies. This study was carried out with objective of formulating an objective structured practical examination (OSPE) format that would increase the validity, reliability and objectivity of the practical exam of 'Embryology & Genetics' paper of the M Phil Anatomy course at BSMMU.

Method:

The present study was a descriptive type of study having some qualitative and quantitative elements. In the study, focus group discussion (FGD) and questionnaire based feedbacks were taken into consideration.

For the focus group discussion the names of all postgraduate anatomists of the country were collected from the souvenir of the latest general meeting on the Anatomical society of Bangladesh. From the list the names of the Dhaka-based anatomists who usually deal or have dealt with 'Embryology and Genetics' were selected and their names were arranged in the alphabetical order. Then, they were contacted through telephone serially to take their consent about the participation in the

focus group discussion. In this way eleven anatomists were selected according to the character of FGD.

All the teachers of the Department of Anatomy, BSMMU were participants as because it is the course of BSMMU. All the participants were invited by the Chairman, Department of Anatomy, BSMMU through an official letter. The agenda of the FGD and some supporting papers were also sent to their respective address.

Most questions of the questionnaire invited direct specific close-ended answers using 5-point Likert scale. Open-ended questions were asked for getting explanations or comments, as well as any further suggestions/comments regarding the improvement of the OSPE format.

The eight-page questionnaire were distributed to all the anatomists all over the country excepting those who participated in focus group discussion in addressed and stamped envelopes through courier service or by hand. Light green paper was used in printing the questionnaire because, Fox et al. cited by Bernard⁶ stated that light green paper produces a higher response rate than white paper. The responses were kept anonymous to avoid any bias.

The data gathered from the focus group discussion were analysed qualitatively, looking for the main

'themes' that emerged from the focus group discussion. Quantitative analyses of the data were done from the close-ended questions and qualitative analyses were done from the open-ended questions of the questionnaire.

Result:

Figure-1 shows the suggested OSPE format.

Table-I shows feedbacks from anatomists on the various aspects of the OSPE format of the 'Embryology & Genetics' paper. It shows that all of such respondents (100%) agreed that the distribution of marks in the OSPE format is acceptable and if the suggested OSPE format is used in the assessment, it will be more reliable than the existing method. The table also shows that most of the respondents (about 95%) agreed that the number of question and procedure stations and time allocation were practicable. The table also shows that the mean score for each answer was more than 3 (i.e. favorable).

Table-II shows comments/suggestions from anatomists on the OSPE format received through the questionnaire-based feedback.

Table-III shows themes that have emerged from the focus group discussion on the OSPE format.

Fig.-1

The suggested OSPE format of the 'Embryology & Genetics' paper

Type of station	Station	Sub station	Type of material or procedure to be used	Material/ procedure selected*	Marks allotted	Time allotted (min)
Question station	Station:1	A	Figure: Drawings/photographs/ micrographs/projectionslides/computer images/radiological images	...	5	5
		B	Model
	Station:2	A	Cadaver/Skeletal component	...	5	5
		B	Slides of chick embryo
	Station:3	A	Viscus/Anomalous specimen	...	5	5
		B	Pedigree chart
Procedure station	Station:4	-	Procedure chosen from a supplied list for Embryology			5
	Station:5	-	Procedure chosen from a supplied list for Genetics			5
Total marks and time				25	25	

*There will be question(s) on each selected material in a Question station.

Table-II

*Comments/suggestions from anatomists on the OSPE format received through the questionnaire-based feedback**

Number	Comments/suggestions
1	“Regarding time allocation until and unless it is practiced, it is very difficult to predict. After few trials it can be readjusted”.
2	“OSPE become very much specific and considering the time of the course, it will be very difficult for students to achieve these skills by themselves. Every teacher of the department should be involved to provide proper guidance to the students and students should be provided with a proper and appropriate booklist.”
3	“A teacher should be proficient not only in knowledge and skill aspect he should be adequately skilful in expression appropriate attitude towards his/her students. But I feel this aspect has not been adequately dealt with in this OSPE format.”

*All the comments are compiled here as they were (i.e., without any change or correction)

Table-III

Themes that have emerged from the focus group discussion on the OSPE format

Agenda	Theme*
Justification of inclusion and distribution of different tools	a. The inclusion and distribution of different tools are justified
Procedure and question station	a. There are mixed feelings about the procedure and question stations

* Derived from the transcriptions of audio-taped discussions and translated from Bangla to English

Discussion

OSPE format has been formulated through the present study for structuring the practical exam. There is no Objective Structured Practical Examination (OSPE) format for the ‘existing’ practical exam system of the ‘Embryology and Genetics’ paper in the Department of Anatomy, BSMMU. OSPE is an assessment tool in which the components of practical competence such as history taking of a simulated case of a genetic disorder, simple procedures, interpretation of lab results, communication, attitude etc, are tested using agreed checklists⁷. The assessment of skills is more difficult than that of knowledge because each skill consists of complex physical manoeuvres performed in a prescribed sequence⁸. For assessing multiple psychomotor skills the ‘suggested’ OSPE format has been formulated through the present

study and students’ knowledge and skills may be assessed objectively. Since scoring is independent of the examiner’s opinions, the method is ‘objective’ and since it has a predetermined structure, the examination may also be called ‘structured’. Thus Deepak⁸ realised that the name ‘OSPE’ itself is self explanatory regarding the nature of the examination procedure. He also stated that OSPE makes the practical exam more reliable, valid, relevant and practicable. Psychomotor skills to varying degrees of competency should be assessed at all levels. Therefore, OSPE should be tried for the assessment of psychomotor skills at all levels. OSPE is basically modelled on the lines of OSCE⁸. OSCE is regarded as a reliable and valid examination not only for medical students but also for residents in a variety of disciplines⁹. These experiences can be used to motivate people in

developing improved OSPE system covering embryological and genetic topics in a feasible way.

Although any examination instrument has some limitations¹⁰, OSPE undoubtedly is an important examination method and its use is becoming more widespread in most of the countries all over the world¹¹.

Nayar¹² pointed out that OSPE has some disadvantages for the examiner in a sense that (s)he has to be prepared for:

- Hard work
- Advance planning
- Organization
- Staff co-operation and
- Co-ordination.

Yet, once an OSPE is set - Organisation is easy

- Question bank can be made
- Checklist can be reused
- Large number of students can be examined in a short time

Some problems are anticipated regarding construction of the procedure stations. However, hard work may solve the problem, and for proper running of the OSPE, especially the procedure stations, proper checklists would be essential.

It is interesting to note that 90% of the anatomists responding to the questionnaire of the present study either agreed or tended to agree that the present trend in practical examination is more theoretical because of inadequate assessment of practical skills. Nayar¹² observed that "very little attention is paid by individual departments to ensure that the skills which are expected out of the students at the end of the course are actually developed". This is the trend in institutions of Bangladesh as well. If the objectives of the practical exercises are clearly defined, then the practical exams should also be designed to assess the fulfillment of those objectives. It is essential for the validity of a practical exam that it tests the attainment of the particular practical skill rather than just gather the knowledge of the skill.

Without prior planning, it is always difficult to distribute the contents in the practical exam according to their weightage, and there is always a risk of repetitions. A planned OSPE format is expected to cope up with this problem.

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