Objective Structured Practical Assessment and Feedback (OSPAF) as a Teaching Tool for Learning Pathology for Medical Students: A Control Trial

**Abstract**

Background: There is strong support for the role of teacher feedback in the formative assessment in literature. Objective structured practical examination (OSPE) has been used effectively as a tool of assessment. However, its role has usually been limited to one of the low stakes examination. Thus there is a need to increase the utility of OSPE as teaching tool and to evaluate its effectiveness.

Objectives: 1. To integrate an element of constructive feedback into the existing OSPE, converting it into objective structured practical assessment and feedback 2. To assess the effectiveness of OSPAF as a teaching tool in terms of student performance.

Methods: Randomly selected batches of students were given feedback after the assessment task and the effectiveness of the feedback was assessed by comparing the pre-test and post-test marks of student group who had been given feedback and those who had not been given feedback. Questionnaire and focused group discussions were used to get feedback from the students and faculty.

Results: Though there was a positive response from the students and the faculty regarding the OSPAF, there was no statistically significant improvement in the performance among the students who had been given feedback (p=0.551 and 0.886).

Conclusion: OSPAF was a tool a good teaching tool as seen as response from students and faculty. However the significant change in the performance of the students could not be proved in the present study.

Introduction:

For long assessment has been viewed primarily as a means of measuring student learning for accountability purposes. However, recently, there has been a call for a balanced assessment systems which can be used to advance learning in addition to measuring student learning for accountability decisions.

Feedback is one of the most powerful influences on learning. There is strong support for the role of teacher feedback in the formative assessment in literature. The constructive feedback where in the students are informed about the task at hand and how to perform it more effectively has a higher effect size as compared to feedback given in the form of just grades or marks.

OSCE and OSPE, as described by Harden and group as an innovation, is now one of the tool of assessment which has stood the test of time. It has conventionally been used, most of the medical colleges in India have limited its role as one of the tools for assessment in low stakes examination. Researchers both from India and abroad have modified OSPE/OSCE as teaching tools and have reported positive elements such as efficient use of resources in addition to its educational impact. However not many studies have exactly quantified the change seen after adapting the tool as a teaching tool. Thus, the present study was conducted to integrate an element of feedback into the existing OSPE converting it into OSPAF and study the effectiveness of OSPE as a teaching tool in terms of student performance. The conceptual framework used for the study was Margaret Heritage’s “Formative Assessment Model”.

**Keywords**

OSPE, OSPAF, Learning, Pathology

**Abbreviations**

OSPE: Objective Structured Practical Examination

OSPAF: Objective Structured Practical Assessment and Feedback

OSCE: Objective Structured Clinical Examination

MBBS: Bachelor of Medicine, Bachelor of Surgery

MSc: Master of Science

MD: Doctor of Medicine

MPhil: Master of Philosophy

HOD: Head of Department

IOM: Indian Journal of Medical Sciences

MAM: Master of Medicine

JNMC: Jayanagar Medical College

BIMS: Belgaum Institute of Medical Sciences

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Ten stations for the OSPE were chosen after consultation with all the teaching faculty of the department and were arranged as per the routine evaluation protocol which included two procedure stations and eight response stations. Time allocated for each station was 5 minutes. Checklist was prepared for all the stations and the students were assessed using the checklist. Feedback was given at the end of each station for those students who were included in the “feedback” group after assessing and rating their performance. The raters were trained prior for giving feedback. The students in the “feedback” group were instructed not to disclose any information to the remaining students. The scores in the OSPE was taken as “Pre-test” scores.

Another session OSPE (which was not a part of routine examination protocol) was conducted 3 months after the Pre-test and scores were recorded as post test scores. This was also conducted in the same pattern as the first with the same stations. The students in the “no feedback” were given feedback in this session after the assessment process.

Feedback was taken from the students at the end of the second session from all the students by a focused group discussion and questionnaire with a rating on three point scale. Feedback from the faculty was obtained by a focused group discussion.

The scores obtained in the pretest and post test by both the groups were compared with the scores obtained in the summative practical examination which was conducted after about two months from the post test.

Statistical Analysis:
Student t-test was used to compare the scores between the two groups in the pre-test and post test. Paired t-test was used to see the difference in the scores in pre and post test within the groups. The responses in the feedback questionnaire were presented as rates and percentages. Pearson’s correlation was done to see the correlation between the scores in pretest and post test of both the groups with the summative examination scores.

Results:
Of the total 145 students, 87 were included in the “feedback” group and 58 were included in the “no feedback” group. 19 of the “feedback” group and 13 of the “no feedback” group remained absent for the post test. One student of the “no feedback” group was absent for the pre-test. The students who were absent for either test were not considered for analysis.

The mean scores in the “no feedback” were better than the scores in the “feedback” group in both pre-test and post test (p<0.001 and .005 respectively). (Table1)

There was no significant difference in the post test scores of both the groups. In fact the scores in the post test were less than those in the pre-test. (p=0.551 and 0.886 for “feedback” and “no feedback” group respectively) (Table2)

There was statistically significant difference in the scores obtained in preliminary examinations by both the groups. (Table 3)

There was significant positive correlation between the scores obtained in the pre-test and preliminary examination scores (r = 0.43; p=0.001) by the feedback group. However no significant correlation was of the post test scores and the preliminary examination. (Table 4)

There was no statistically significant correlation of pretest marks of the “no feedback” group with the scores obtained in the preliminary examination. However the post test marks of the “no feedback” showed a significant positive correlation with the preliminary examination scores (r = 0.513; p=0.004). (Table 4)

The feedback form in the form of questionnaire was answered by 108 students. There was an overall positive response towards use of OSPE as a assessment tool as its utility as a teaching tool. Majority of them agreed that OSPAF could be a could be a teaching tool and OSPE could be the ideal setting for giving the feedback. Minority of the students in the focused group discussions expressed that though OSPE was good assessment tool which is more objective, more scoring and unbiased, revisions of all the exercises in the exams could be a more effective for the feedback sessions.

There was an overall positive response of the faculty towards the OSPE. The agreed to the fact that the feedback given in OSPE stations could help for the better performance. They also agreed that the mistakes committed by the students in the OSPE could give reflections in the teaching methodology and improve or stress more on those areas which were deficient. The increased time consumed for the feedback session was one of the issues raised but everybody agreed that OSPE would be an ideal setting for giving the feedback where in the same resources could be used for giving feedback with a marginally increased time consumption.

Discussion:
Various studies in literature have proved that feedback is one of the most powerful influences which makes a difference to student achievement10. It is most effective when it is timely, relevant, meaningful encouraging, and offers suggestions for improvement that are within students grasp11. A meta-analysis of showed variable effect size for different types of feedback with a highest effect size noted for those which involved students receiving feedback about a task and how to do it more effectively and a lower effect size noted for those related to marks, grades, praise, rewards and punishment10. The need for the feedback to be given early in a unit or promptly after assessment cannot be over emphasized. Such a feedback will provide the student sufficient opportunity to use the feedback for improving subsequent performance12,13. In the present study also, the feedback sessions were conducted immediately after the assessment task and in the 2nd term which is the midway of the course so that the students get an opportunity to work on their deficiencies using the feedback for their better performance in the subsequent summative examination.

Various studies show a positive impact of using OSPE as a teaching tool. A study conducted modified the existing OSPE sessions from existing OSCE materials to provide
feedback to students on their doctor–patient relationship skills and history and physical examination skills. The study showed that modified OSPAF is an efficient use of teaching resources in addition to its educational impact. Another study also used OSCE with video-taped feed back and assessment as a teaching tool which had a favorable response from both students and the tutors. An Indian study from NIMHANS -Adapted OSCE for post graduate psychiatry training. They used the term OSCAF (objective structured clinical assessment and feedback) for the modified method. They proposed it to be convenient, cost effective training method in psychiatry. However they have recommended further refinements in rating and feedback methods to enhance its utility. The present study also showed a positive response for the modified OSPF i.e. OSPAF to be a good teaching tool with an efficient use of the existing resources as evidenced in the feedback from students and the focused group discussions with students and faculty. However most of these studies have not quantified the change occurred in the performance of the students after using the modified method. The present study tried to evaluate the change seen in the performance by comparing the pre-test and post-test results of the two groups. However the results did not show any significant difference among the two groups and between the pretest and post- test scores. As the margin for improvement in the post test scores was very less as the scores obtained in the pretest scores were comparatively higher than the conventional practical examinations, the change could have been insignificant. Thus the difficulty index of the task is an important factor which determines the effect size of the feedback. Also as the post-test was not a part of the regular evaluation protocol, the seriousness about performing better could not be communicated to the students effectively. Thus the context of assessment and the seriousness of the assessment session is an important drive for the students for performing better.

Conclusion: OSPAF was a tool a good teaching tool as seen as response from students and faculty. However the significant change in the performance of the students could not be proved in the present study.

Recommendations: The present study recommends to include OSPAF as a part of the formative evaluation protocol. However more studies need to be conducted to evaluate the effectiveness of the OSPAF in different settings with different types of assessment tasks of variable difficulty index, to quantify its exact use and the effect size.

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We also thank Dr SS Goudar, and other faculty of PG-DHPE course, KLE University, for their guidance for the study.

Table 1: Depicting the scores of students in “feedback” and “nofeedback” in pre-test and post-test

<table>
<thead>
<tr>
<th>Feedback group</th>
<th>N=144</th>
<th>Pre-test (Mean±SD)</th>
<th>N=113</th>
<th>Post-test (Mean±SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No feedback</td>
<td>57</td>
<td>38.9±4.08</td>
<td>45</td>
<td>38.9±9.11</td>
</tr>
<tr>
<td>T</td>
<td>3.968</td>
<td></td>
<td>2.878</td>
<td></td>
</tr>
<tr>
<td>p-value</td>
<td>&lt;0.001</td>
<td></td>
<td>0.005</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Depicting the difference in the pretest and post test scores

<table>
<thead>
<tr>
<th></th>
<th>Mean change</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feedback</td>
<td>↓1.8±8.95</td>
<td>t=0.598: p=0.551</td>
</tr>
<tr>
<td>No feedback</td>
<td>↑0.9±5.44</td>
<td>Z=0.143: p=0.886</td>
</tr>
</tbody>
</table>

Table 3: Showing the comparison of marks obtained by both the groups in the summative (preliminary) examination

<table>
<thead>
<tr>
<th></th>
<th>Number of students attending</th>
<th>Preliminary examination scores (Mean score±SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feedback group</td>
<td>49</td>
<td>53.2 ± 8.24</td>
</tr>
<tr>
<td>No feedback group</td>
<td>33</td>
<td>53.9 ± 6.86</td>
</tr>
<tr>
<td>P value</td>
<td>t=0.353; p=0.725</td>
<td></td>
</tr>
</tbody>
</table>

Table 4: Showing the correlation between preliminary examination scores and scores in pretest and post test among both the groups

<table>
<thead>
<tr>
<th></th>
<th>Feedback</th>
<th>No feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation coefficient r</td>
<td>P value</td>
<td>Correlation coefficient r</td>
</tr>
<tr>
<td>Pretest</td>
<td>0.43</td>
<td>0.001</td>
</tr>
<tr>
<td>Post test</td>
<td>0.071 0.674</td>
<td>0.513</td>
</tr>
</tbody>
</table>

Table 5: Showing the feedback of students

<table>
<thead>
<tr>
<th>Questions</th>
<th>Agree (Percentage)</th>
<th>Neutral (Percentage)</th>
<th>Disagree (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The OSPF was conducted in a well organized manner</td>
<td>96.29</td>
<td>3.7</td>
<td>0</td>
</tr>
<tr>
<td>2. The examination conducted covered most of the aspects learnt in pathology during the course time</td>
<td>89.81</td>
<td>10.19</td>
<td>0</td>
</tr>
<tr>
<td>3. Feedback was given for all the stations of OSPF</td>
<td>91.67</td>
<td>7.41</td>
<td>0.92</td>
</tr>
<tr>
<td>4. Feedback given was relevant to the questions asked in the stations</td>
<td>95.37</td>
<td>4.63</td>
<td>0</td>
</tr>
<tr>
<td>5. Feedback given is helpful for improving our learning</td>
<td>91.67</td>
<td>7.41</td>
<td>0.92</td>
</tr>
<tr>
<td>6. Feedback given will improve our performance in the examination</td>
<td>89.81</td>
<td>10.19</td>
<td>0</td>
</tr>
<tr>
<td>7. OSPF is an ideal setting for giving feedback</td>
<td>77.78</td>
<td>12.03</td>
<td>0.92</td>
</tr>
</tbody>
</table>
8. The feedback given was ideal for all the stations  
95.37 4.63 0

9. Giving feedback should be a part of other assessment processes  
79.63 11.11 0

10. OSPAF( Objective structured Practical Assessment and feedback)
can be good teaching tool to learn pathology  
95.37 4.63 0

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