

# Open book examination as an effective tool for reviewing the subject and reinforcement of the concepts in medical education – II<sup>nd</sup> MBBS student's perspective

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## Abstract

**Aim:** The aim of the study is to assess the medical students perspective on Open book examination as an effective tool for reviewing and reinforcing the concepts in medical education. **Method:** Open book examination was conducted to second MBBS students (n=130). 3 sets of pre-validated questions were given to the students. The questions were framed to assess the higher cognitive levels rather than recalling ability. At the end of the exam, a feedback form was given to the students and the results of the feedback were analyzed using Likert scale. **Results:** 56% of the students agreed with the content and relevance of open book examination. The student's perspective on open book examination was agreeable with 60%. 75% gave good rating for the organization of the session. The overall impression of the students was 52% agreed for open book exams and 27% disagreed. **Conclusion:** The student's perspective on open book examination is agreeable and the students felt that open book exams give a better understanding of the subject and motivates the students on self-learning. Open exams enhances the students skills in reinforcing the concepts thereby improving the deep learning.

**Keywords:** Open book examination, Medical student's perspective, student's assessment, Higher cognitive skills.

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Received Date: 18/01/2016 Revised Date: 08/02/2016 Accepted Date: 06/03/2016

Access this article online	
Quick Response Code:	Website: <a href="http://www.statperson.com">www.statperson.com</a>
	DOI: 06 March 2016

## INTRODUCTION

Learning is an active and a continuous process which results in a relatively permanent change in the behavior of the learner. There are many levels of learning with the most primitive being signal learning to the most complex

problem solving learning<sup>1</sup>. Problem solving is the highest form of learning and it involves several rules to solve a practical problem<sup>2</sup>. In a study by Hoffman et al., they have shown superior performance on the students who were taught on problem based learning (PBL) curricula rather than traditional curricula<sup>3</sup>. In order to assess the highest form of learning, the examination pattern should focus more on knowledge application and analysis rather than focusing on recall and understanding. The challenges a medical student face once he graduates is enormous. Hence in addition to the conventional closed book examination which tests the recall, an Open Book Examination enhances the student's ability to understand, apply and analyze the concepts. In Open Book Examination, the students are permitted to refer text books, instructor's hand outs and their own notes. The anxiety level of the students is less in an Open Book

Examination compared to the closed book examination<sup>4</sup>. However there are certain difficulties in Open Book Examination. The examiner preparing the questions must be well aware of the concepts of open book examination and select the questions accordingly. The primary emphasis must be on testing the application and analysis of the concepts rather than simple recall. From the student's perspective, they may treat the exam time as time to learn rather than study it thoroughly in advance. There is also less motivation from the students to prepare in advance as they rely in the reference materials. The purpose of this study is to assess the student's perspective on Open Book Examination through a feedback questionnaire.

## MATERIALS AND METHODS

The participants in the study were second year MBBS students of Tagore Medical College and Hospital (n=130). Ten days prior to the Open book examination (OBE), the students were briefed about the pattern of OBE and the topic (Pathology of Central nervous system) was given. 3 sets of pre validated question papers were prepared. The questions were framed to assess the higher cognitive levels rather than recalling ability. The

questions were problem based questions and assessed by faculty members of Pathology and interns of Tagore Medical College to ensure uniformity in difficulty levels. The students were allowed to carry text books, class notes and print outs. The time given was two hours and total marks were 40. The answer sheets were collected and a feedback was taken at the end of the session. The feedback form consisted of a total of 15 sets of questions with score minimum score of one to maximum score of five (1=strongly disagree to 5=strongly agree). Later the feedback forms were analyzed using 5 point Likert scale and the results were tabulated.

## OBSERVATION AND RESULTS

A total of 130 students participated in the study. All the students filled the feedback questionnaires. There were 15questions assessing the content and relevance of the questions asked, their perspective on Open Book Examination and the organization of the session. The responses were analyzed using 5 point likert scale. The content and relevance were assessed by 5 questions. The student's rating for content and relevance is summarized and tabulated in Table1.

**Table 1:** Feedback summary on content and relevance of the examination

Sr. No	Questions	1 (Strongly Disagree)	2 (Disagree)	3 (Neither agree nor Disagree)	4 (Agree)	5 (Strongly agree)
1	Standard of the questions was adequate	5%	5%	16%	53%	21%
2	Chapter was covered adequately	11%	19%	34%	29%	7%
3	The answers were searchable	8%	12%	24%	38%	18%
4	The questions tested my understanding Of the subject	7%	11%	27%	37%	18%
5	The question pattern was satisfactory	9%	12%	21%	46%	12%

The student's rating about the content and relevance of the questions were very positive. 96 out of 130 (74%) accepted that the questions were standard for an open book examination. The student's felt the distribution of questions covering the entire chapter could have been

better. They also felt that the question pattern was satisfactory (58%) and the answers were searchable (56%). 55% felt the questions tested their understanding of the subject. The student's rating on perspective of Open Book Exam is summarized and tabulated in Table2

**Table 2:** Feedback summary on student's perspective on Open Book Examination

Sr. No	Questions	1 (Strongly Disagree)	2 (Disagree)	3 (Neither agree nor Disagree)	4 (Agree)	5 (Strongly agree)
1	More Open Book Exams are needed	21%	12%	21%	21%	25%
2	Using Books in the exam was helpful	5%	7%	12%	38%	38%
3	Open book exam makes me read consciously during the test	10%	13%	20%	35%	22%
4	The pressure of finding answer acts as a stimulant	7%	7%	14%	44%	28%
5	I wanted to check the answers after the exams	8%	11%	15%	38%	28%
6	Open Book Exam helped me understand the subject	13%	20%	24%	30%	13%

We got mixed response from the students on whether open book exams needed or not. 33% said they did not want open book exam. However 46% strongly voted for more open book exams. However most of the students agreed that using books in the exam was very helpful (76%) and the pressure of finding the answers acts as a

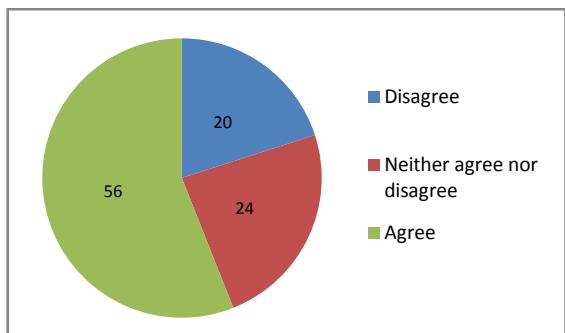
stimulant to prepare well in advance (72%). Most of the students wanted to check the answers after the test (66%). Majority of the students felt that open book exam helped them understand the subject better (43%). The student's rating on organization of Open Book Exam is summarized and tabulated in Table 3

**Table 3:** Feedback summary on organization of the session

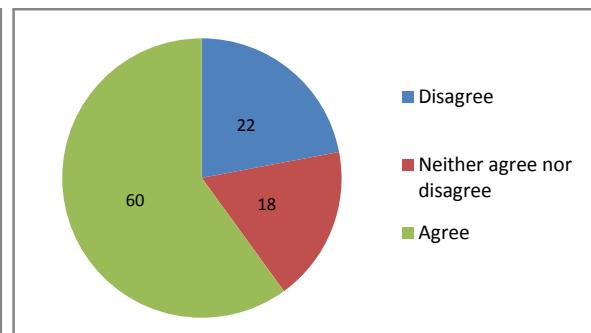
Sr. No.	Questions	1 (Strongly Disagree)	2 (Disagree)	3 (Neither agree nor Disagree)	4 (Agree)	5 (Strongly agree)
1	The exam was properly organized	5%	7%	18%	45%	25%
2	The atmosphere was conducive	5%	8%	15%	48%	24%
3	Time given was adequate	5%	6%	8%	44%	37%

Majority of the students gave maximum scores for the organization of the session including the atmosphere and time. The last question in the feedback form was on the overall impression of the students on open book exam. ,

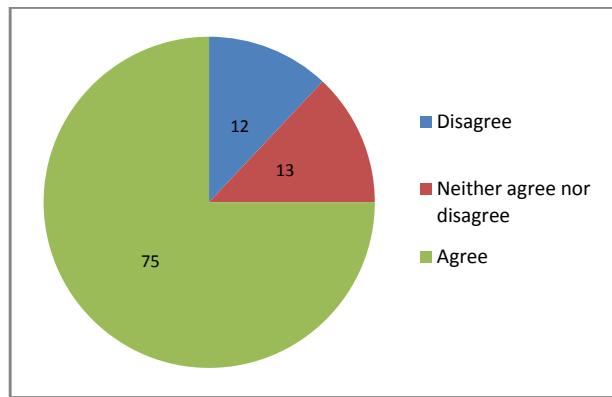
24% strongly agreed with the open book exams, 28% of the students agreed, 21% neither agreed nor disagreed, 18% disagreed and 9% strongly disagreed. Likert scale analysis of results



**Figure 1:** Content and Relevance of the examination



**Figure 2:** Student's perspective on Open Book Examination



**Figure 3:** Organization of the session

## DISCUSSION

Learning and assessment are integral part of medical education. Medical education is a dynamic process. The students should cope up with the evolving and changing concepts in medical field. A medical graduate should acquire both core and backup knowledge. The conventional closed book exams test mainly the core knowledge. Open book exams aim at testing the backup knowledge. OBE helps the students in learning and

developing problem solving skills. Openbook exams does not need memory. It provides a chance for the students to acquire knowledge in the preparation process by gathering suitable learning materials. It also enhances the information retrieval skills of the students by finding answers thereby promoting the comprehension and synthesizing skills of the students. Gharib et al., in their study proved that 53% preferred open book exams than conventional closed book exams<sup>4</sup>. Marjolein Heijne Penninga et al., found that Open book exams helps the

students to handle a large amount of knowledge, but also improve their retention of core knowledge<sup>5</sup>. Open book exams improves the deep information processing<sup>5</sup>. In closed book exams the students tend to postpone their study at the end of the semester. But in Open book exams they tend to consult various resources and interrelate the information acquired<sup>6</sup>. However other studies give contradicting results. According to Marjolein Heijne Penninga and Jan B M Kuks, closed book exams stimulate deep learning approach rather than the open book exams. They concluded in their study that students feel more motivated to study in closed book exams and are more confident compared to open book exams<sup>7</sup>. The content and relevance of the questions in our exam were appropriate as rated by the students. 74% students felt the questions were standard for open book exam. This is very essential for the questions to be appropriate for open book exams. According to Shine S et al., open book exam demands more thought and skill from the test constructors<sup>8</sup>. The students also agreed that the chapter was covered adequately and the answers were searchable. The questions tested the understanding of the subject was agreeable to 55% of students. This clearly points out that the questions were not the tests of recall. They tested the higher cognitive abilities such as knowledge application and analysis. Gupta MS., in their study suggests that open book exams are ideal for framing questions to higher cognitive skills<sup>9</sup>. 20% of students did not agree with the question pattern. They found that problem based questions were difficult. Marjolein Heijne Penninga in their study suggested that students with high need for cognition can utilize open book examination and perform better<sup>5</sup>. When medical students are exposed to problem solving skills in MBBS classes, they can perform better in real life scenarios. In our study majority of the students wanted more open book exams. But 33% disagreed with the open book exam pattern. This could be due to the fact that these students underestimated the concept of open book exams and did not prepare in advance as shown by other studies as well<sup>10,11</sup>. 76% of the students agreed that using books in the exam was helpful and it makes them read more consciously during the test. This clearly reflects that the students tend to use deep learning approach rather than surface learning. But another study suggests that closed book exams stimulate deep learning more compared to open book exams<sup>5</sup>. 66% of the students accepted that they want to check the answers after the exam. Hence open book exam really motivated the students on self learning<sup>6,12</sup>. Most of the students felt open book exam helped them understand the subject better. This again reinforces deep learning approach. Most of the students gave good ratings for organization of the session including the atmosphere and time duration.

Generally open book exams need more time than closed book exams. This clearly reflected in our study and study by Durning SJ<sup>13</sup>. 11% students could not complete the test in the stipulated time. This may be due to the fact that these students did not prepare in advance or used surface learning and hence used the exam time to search for answers. This is further proven by the fact that 11% of the students felt using books in the exam was not useful to them. But Heijne and Kuks in their study pointed out that reducing the test time might force the students to prepare longer and deeper for open book examinations<sup>14</sup>. The overall impression of the students was 52% agreed for open book exams and 27% disagreed. The disadvantage of the present study is that we assessed only the feedback of the students. We did not take into account the scores of the students in the present study. Another disadvantage is that most of the students were taking open book exam for the first time. Hence they may not be aware of the strategies in an open book exam.

## CONCLUSION

Open books exams improves backup knowledge of the students with the better understanding of the subject. The students feel more confident in the subject in an open book exam. With the growing body of knowledge in medical education, in addition to the conventional closed book exams, open book exams are very much needed. In the current scenario, open book exams can be utilized as a tool for effective learning and reinforcing the concepts. Further research must be done to evaluate the combined efficacy of open and closed book exams in medical education.

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Source of Support: None Declared  
 Conflict of Interest: None Declared