

## Introducing e-learning in microbiology: A pilot study

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### Abstract

**Introduction:** E-learning is the use of internet technologies to facilitate self directed learning and enhance knowledge and performance. Therefore e-learning resources can be used to promote active learning among medical students.

### Aims & Objectives:

1. To introduce e-learning in the department of Microbiology
2. To assess the perception of the students about e-learning

**Materials and Methods:** This study was carried out in the Department of Microbiology of our medical college. First all 150 students of 2nd prof. MBBS were sensitized about the concept of e-learning and their perception was taken in the form of a feedback questionnaire. Then 75 volunteers were selected and a Google group was formed. The study material was given in the form of power point presentations, photo quiz and text questions with help of Google document. At the end of two months feedback was taken from the students in the form of semi-structured pre-validated questionnaire and data obtained was analysed statistically. Questionnaire included both closed ended as well as open ended questions

**Results:** Data obtained from feedback questionnaire showed that the programme was beneficial for them. Almost 100% students said that new teaching learning method increased the understanding of the topics covered under it and also that the topics covered were important for them.

**Conclusion:** There was a positive response shown by the students towards new teaching learning method. Students found it interesting, relevant and beneficial. It increased their understanding of the topics covered under it. It also increased interaction between teacher and students. To conclude e-resources can be a useful supplement to conventional lecture-based teaching in the medical curriculum.

**Keywords:** e-learning, Google groups, Internet technologies.

### Introduction

Conventional lecture-based teaching is the most commonly practiced method of teaching in medical schools in India and worldwide. Its major advantage is that it is an efficient way of delivering a considerable amount of information to a large group of students.<sup>1</sup> However, it has a major limitation also and that is: students are usually passive participants in the process and often find it difficult to sustain interest in the subject over the duration of the lecture.<sup>2</sup>

In past few years there has been increase in the number of medical colleges and medical students in India but there is shortage of trained faculty. In such a scenario electronic resources which can reach out across time and space barriers can facilitate accessibility to information. Tools for developing asynchronous and synchronous e-learning courses that build knowledge and skills in academic settings are available.<sup>3</sup> Many universities worldwide have developed e-learning resources for their students. However in India e-learning in medical education is still in a nascent stage. There are few studies on the use of e-learning as an adjunct to conventional lecture-based teaching. In a study *Shanthikumar* (2009) has reported that use of podcasts was effective in enhancing medical students' learning when provided along with conventional lectures.<sup>4</sup> In another study by *Bandhu and Raje* (2014), they used e-learning as an instructional method in oph-

thalmology.<sup>5</sup> The results of their study are clearly shows that e-learning is acceptable to undergraduate medical students as a method of instruction.

The present study was done to assess the perceptions of students about the impact of the e-resources on their learning Microbiology subject and also to obtain feedback and suggestions for improvement of the quality of the e-resources provided.

### Aim

To introduce e-learning in Microbiology as a new teaching learning tool.

### Objectives

1. To introduce e-learning in the department of Microbiology.
2. To assess the perception of the students about e-learning.

### Materials and Methods

**Study Design:** This study was an interventional study.

**Setting:** This study was carried out in the Department of Microbiology of our Institute.

**Time Period:** This was done from June to July 2016 however the sensitization and enrolment of the students was done in month of May 2016.

**Subjects and sample size:** All 150 second professional MBBS were eligible for enrolment in the study but 75 students who volunteered after initial sensitization to the programme were included.

**Ethical approval:** Permission from the Institutional Ethical Committee was taken before starting the project.

**Intervention:** After taking ethical approval preparation of study material (module and selections of the topics to be discussed) was done. Questionnaire and feedback performa for students were prepared.

All 150 students of second professional MBBS were sensitized about the concept of e-learning and their perception was taken in the form of a feedback questionnaire. Anonymity was maintained and only those who were willing to join the programme were asked to write their names and e-mail IDs. 75 students volunteered to participate so they were enrolled for e-learning and a Google group was formed.

The study material on five important topics, decided previously (Tuberculosis, Malaria, Blood culture techniques, staining methods in Microbiology and Culture media) was provided to them in the form of power point presentations, photo quiz and text questions with help of Google document. All the communication was through e mails. At the end of two months programme, feedback on e-learning was taken from the students in the form of semi-structured pre-validated questionnaire

and data obtained was analysed statistically. Feedback questionnaire had both closed ended questions for which a 5 point Likert scale was used (1-Strongly Disagree, 2-disagreeing, 3-Neutral, 4-Agree and 5 -Strongly Agree) it also had open ended questions. Anonymity was maintained and they were asked not to identify themselves by name or roll number

### Statistical Analysis

The data obtained from questionnaire was analysed by using Microsoft Excel 2007.

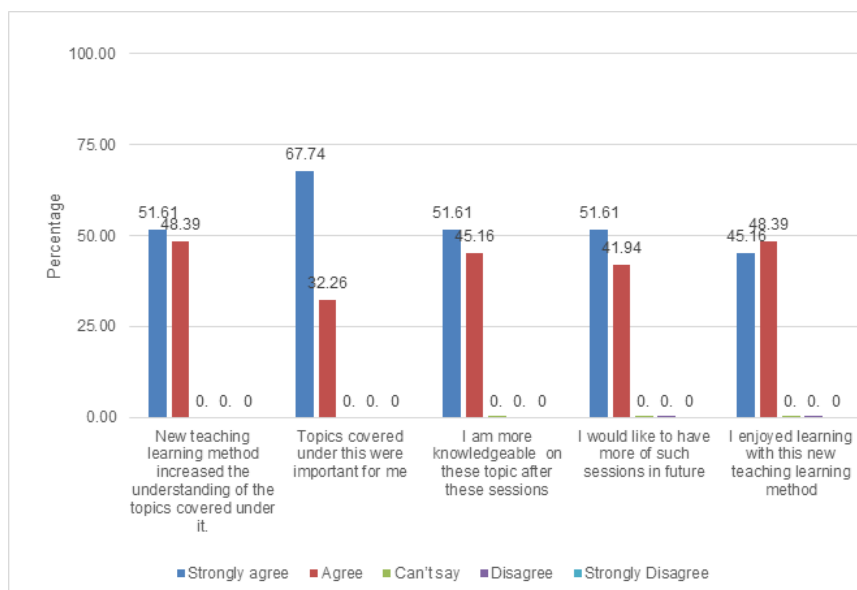
### Observations and Results

A total of 75 (volunteers) MBBS second professional students participated in the current study. Among the participants 50 were female students and 25 males which show females were more inquisitive about new learning method.

Table 1 and Fig 1 shows the results of the closed ended questions that almost 100% students said that new teaching learning method increased their understanding of the topics covered under it. And also that the topics covered were important for them. Almost 94% of the students enjoyed learning with this new teaching learning method and wanted to have more of such sessions in future.

**Table 1 (Results for closed ended questionnaire)**

S.N.	Questions	% of Students who Strongly Agree	% of Students who Agree	% of Students who Can't say	% of Students who Disagree	% of Students who Strongly Disagree
1	New teaching learning method increased the understanding of the topics covered under it.	51.61	48.39	0	0	0
2.	Topics covered under this were important for me	67.74	32.26	0	0	0
3.	I am more knowledgeable on these topic after these sessions	51.61	45.16	0.03	0	0
4.	I would like to have more of such sessions in future	51.61	41.94	0.03	0.03	0
5.	I enjoyed learning with this new teaching learning method	45.16	48.39	0.03	0.03	0



**Fig. 1: Results for closed ended questionnaire**

Table 2 shows the results of open ended questions in which most of the students (49%) liked it because important topics were covered and 26% said that after this exercise the now have better understanding of the topic. 23% liked the interactive group discussions whereas 20% student fond this method as an easy, innovative and a convenient way of learning.

**Table 2 Ques.1: Write two things you liked most about this teaching learning method**

S. N.	Students Response	% of students
1	Important topics were covered	49%
2	Better understanding of the topic	26%
3	Concepts were cleared	23%
4	Interactive group discussions	22.58%
5	Easy and convenient way of learning	19.35%
6	Innovative and interesting way of learning	19.35%
7	Increased knowledge	13%

**Table 3 Ques. 2: Write two things you did not like about this teaching learning method**

S. N.	Students Response	% of students
1	Also include MCQs	84%
2	No face to face communication	58.38%
3	Time limit makes it stressful	9.6%

**Table 4 Ques. 3: What could be improved**

S. N.	Students Response	% of students
1	Should have started early so more topics would have been covered	88.38%
2	Add more MCQs	85.80%
3	Teacher should summarize the topic at the end	22.58%
4	Include two way discussion forum	0.03%

Results of table 3 & 4 suggest that students wanted to include multiple choice questions also which will help them prepare for competitive examination. 88.38% wanted that e-learning programme should have started early so that more topics would have been covered.

Table 4 also suggests that students wanted teacher should summarize the topic at the end.

**Discussion**

E-learning has been used widely to facilitate self directed learning among medical students. This was a

pilot study, intended to know the feasibility of the programme and assess student's perceptions of the impact of e-resources in learning Microbiology. Many tools that are available online which are being used in the field of Microbiology.<sup>6</sup>

The results of the study provided interesting feedback. The students found e-learning as an easy and convenient method of learning. This has been shown by other studies also that advantage of online web-based learning is that it is accessible from nearly any location with internet connectivity at any time of the day (table 2).<sup>7,8</sup>

Many students (49%) wrote that “e-resources helped in quick revision of important questions as all the topics covered were important from examination point of view” (table 1& 2). Some studies have shown that e-learning improved performance of students when compared to traditional teaching methods.<sup>9-11</sup>

However when students were asked about things they didn't like about this learning method, most of them actually suggested that it should also include multiple choice questions which will help them prepare for competitive examination. We have noted down the suggestions for future references. The only suggest disadvantage was that there was no face to face communication.

Overall the study demonstrated that students are very satisfied with e-learning. This has been shown by other studies literature which shows that the learner's satisfaction rates increase with e-learning when compared to traditional learning.<sup>12</sup>

## Conclusion

There was a positive response shown by the students towards new teaching learning method. Students found it interesting, relevant and beneficial. It increased their understanding of the topics covered under it. It also increased interaction between the teacher and students. Its effectiveness can increase if combined with conventional lecture-based teaching and provide a blended-learning educational experience.

## Limitations

In this study we explored only a small aspect of e-learning with the help of Google groups where as the introduction of e-learning in programme for the institute requires development of e-learning material which further requires a large investment in the form faculty, time and money.

## My Reflections

- 1. What was good:** Students liked the e-learning programme and found it to be interesting, innovative and easy way of learning.
- 2. What could have been differently:** As desired by students it should have been started few months early so that more topics would have been covered.

Moreover assessment should have been included to see the impact.

- 3. The road ahead:** It was a pilot study and results are convincing so sensitization of other faculty can be done so that it can become a regular feature in all the departments. This will enhance knowledge and performance of the students.

## Implications

E-learning will facilitate self-directed learning among medical students.

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