Asynchronous versus Traditional Teaching for MBBS Undergraduate Students-Effectiveness and Students Perspectives - A Pilot Study

Abstract

Background: Traditional lectures continue to be one of the common ways of teaching practiced in medical schools across India. However, there are many other effective ways of teaching in large groups and lately e-learning modules, which can be synchronous, asynchronous, or blended, have been used to complement face-to-face interactions. E-assignments have been effectively used to engage students into meaningful learning. Aim: The aim of the study is to compare asynchronous teaching with traditional teaching in terms of student perspectives and learning. Materials and Methods: After taking ethical clearance from the Institutional Ethics Committee, the study was conducted involving 66 student volunteers from MBBS 2nd year. All the students were subjected to a pretest on the topic – “low backache” prior to the intervention. The students were then divided into two groups: Group A and Group B of 33 students each. Group A was taught by traditional lecture method, while Group B was given an e-assignment on the topic for which no face-to-face interaction was done earlier. The students from both the groups were then subjected to a posttest followed by feedback. Results: Analysis of covariance, considering the pretest score as a covariate, revealed that the two groups were comparable to begin with \( P = 0.632 \). After the intervention, posttest mean scores improved significantly \( (P < 0.001) \) within each group, for both the groups, but there was no significant difference in posttest scores on intergroup comparison \( (P = 0.507) \). Student feedback brought to light that 85% of the students felt that the traditional lecture method followed by e-learning would be of a great benefit to them. Conclusion: Although no single method emerged as superior over the other, student feedback revealed that 90% of the students graded e-module as either satisfactory to good. Most felt that lecture followed by e-modules will help them to learn better.

Keywords: Asynchronous teaching, e-learning, traditional lecture

Introduction

Teaching has evolved over the years.\(^1,2\) The traditional teaching, which involves face-to-face interactions between the students and the teacher, has numerous advantages. One of the very clear advantages is the reinforcement of the learning environment through vital personal interactions between learners and instructors. The supportive learning environment in face-to-face interactions affects the psyche in a positive manner, inspiring even the least motivated learner to get involved.\(^3\) However, with the advent of electronic media and its increasing use in our daily lives, e-modules are being used for synchronous as well as for asynchronous teaching or to complement traditional teaching. The distinct advantage of asynchronous e-modules is that it permits each student to study at his or her own pace, thus offering a flexible mode of learning. Some studies report that the flexibility inherent in asynchronous e-learning modules has yielded higher satisfaction rates among learners,\(^4\) while on the other end, we have found that even very high-quality online lectures, when used as teaching-learning tools, have not yielded superiority over conventional methods with no significant changes in the test scores.\(^5\) Hence, the purpose of this study was to carry out a pilot study in order to understand student perspectives as well as to compare the effectiveness of the traditional face-to-face teaching with an asynchronous e-learning module among 2nd-year MBBS undergraduate students in our setup.

Materials and Methods

After due ethical clearance from the Institutional Ethics Committee, the study...
was conducted by involving 66 willing 2nd-year MBBS students from a batch of 100 students, as 23 students were absent on the day of enrollment, while 11 students refused to participate in the study. Thus, a total of 66 undergraduate medical students participated in the study.

All students were subjected to a multiple-choice question-based pretest on the topic – “low backache.” After the pretest, they were randomly divided into two groups: Group A and Group B, comprising 33 students in each group. Group A was subjected to an interactive lecture on “low backache” in a traditional manner, while Group B was mailed an e-module on “low backache.” The e-module comprised videos and PowerPoint slides on “low backache” for self-study. Both the groups were then subjected to posttest, 3 days later. Posttest was followed by feedback from both Groups A and B. At the end of the study, a lecture on “low backache” was taken for Group B and the e-module was shared with Group A. The pre- and posttest questionnaire and the feedback forms were validated for content and construct validity by subject experts and residents from the department of orthopedics.

**Statistical analysis**

The collected data were analyzed using statistical software SPSS version 22 (IBM). Quantitative data were expressed in terms of mean ± standard deviation. For feedback analysis, we converted the 5-point Likert scale into three categories, namely good (Likert scale “4 and 5”), satisfactory (Likert scale “3”), and poor (Likert scale “1 and 2”). Paired t-test, independent t-test, and analysis of covariance (ANCOVA) were used to check the effectiveness of the intervention.

**Results**

A total of 66 undergraduate 2nd-year medical students participated in the study, of which 19 were males and 47 were females. The mean age of the study participants was 20.4 years. The two groups were comparable in terms of baseline knowledge on the topic of “low backache” as shown in Tables 1 and 2. ANCOVA considering the pretest score as a covariate was used to rule out any differences at the pretest level. The corrected model value is 3.82, which was not significant ($P = 0.632$), as shown in Table 2.

The pretest scores were compared with posttest scores within individual groups, using paired t-test. The mean scores of the lecture method (Group A) increased from $6.12 \pm 1.65$ to $8.21 \pm 1.55$, while the mean score of e-learning teaching method increased from $5.87 \pm 1.65$ to $7.87 \pm 2.41$.

The scores improved significantly ($P < 0.001$) in both the groups as shown in Table 3.

Independent t-test was used for comparing posttest scores of Group A with Group B (lecture method vs. e-learning method). This method helped us assess the effectiveness of intervention in terms of difference in knowledge gained when the same topic was taught by two different methods. We found no significant difference ($P = 0.507$) between Groups A and B, as shown in Table 4.

**Discussion**

Groups A and B were comparable in terms of their baseline knowledge on the topic of “low backache” as shown in Tables 1 and 2. The intervention led to some interesting findings such as a significant improvement ($P < 0.001$) in the posttest scores, when compared with pretest scores in the same group [Table 3]. This is much in concordance with student feedback where >90% of the students in either group acknowledged an improvement in the knowledge [Table 5].

In our study, none of the methods appeared to be superior ($P > 0.05$) to others in terms of gain in knowledge.
Jordan et al. have earlier reported that the gain in knowledge from asynchronous teaching was not equivalent to traditional teaching for acute care topics among the beginners, but >90% of the students enjoyed the flexibility that asynchronous teaching offered. However, the student feedback in our study revealed that even though students perceived both methods as equivalent, the experience was slightly skewed in preference for the lecture method with >90% of the students rating the experience as either good or satisfactory against the e-module where 72.73% of the students rated the experience as good or satisfactory. The content delivery, expert facilitation, and face-to-face interaction with the teacher could have contributed to the difference. However, the assumption that students are more accustomed to the conventional lecture method cannot be denied. Another study by Warnecke and Pearson reports that 92% of the students felt e-learning is enjoyable and that it helped to increase their existing knowledge. The reason of this behavior could have been the difference in learning styles and personal preferences of students.

Majority of the students (85%) in our study felt that the traditional lecture method followed by e-learning would be of a great benefit to them and shall help them to grasp the subject details better. Earlier studies have also inferred that online curriculums and sharing of computer-based modules can be utilized along with traditional teaching to enhance the learning experience. This brings to light that e-learning modules can be complementary to the lectures and can also help fulfill the knowledge gaps, if practiced routinely. They can help the teacher to take the students to higher order learning. Although a lot will depend on the process of facilitation, the student’s acceptance of e-module as an

| Table 5: Student feedback analysis based on Likert scale: 1-5 (n=66) |
|---------------------------------------------------------------|
| **Student response based on feedback questionnaire** | **Group A (n=33)** | **Group B (n=33)** |
|---------------------------------------------------------------|---------------------------------------------------------------|
| (rating 3 or >3 on Likert scale)                               | (traditional lecture) (%) | (e-module) (%) |
| Learning experience                                           | 90.91                                                          | 72.73 |
| Content was organized                                         | 96.97                                                          | 90.90 |
| Improvement in knowledge                                      | 99.5                                                          | 94 |
| Content met its learning objectives                           | 100                                                            | 93.93 |
| Student satisfaction to faculty’s response to their queries   | 100                                                            | 99.99 |
| Likert scale: 1 and 2=Poor; 3=Satisfactory and 4 and 5=Good    |                                                                 |     |

**Table 6: Students feedback and their opinions “verbatim”**

“Traditional teaching should preferably be followed by sharing of e-material”

“Blackboard and white board teaching are very good. However, the concept gets stronger when we explore the subjects beyond the class, see more of pictures and videos, and get the resource material so carefully prepared by our teachers. Hence, if traditional teaching is followed by sharing of e-learning material, teaching may become even more effective.”

Though I like to explore the topic on internet and often find good videos and study material but if I were searching material on low backache all by myself, I would have been lost. I would have missed most things my teacher emphasized in the class

“E-Learning method is good but we are not able to understand the material sent on e-mail without the help of teacher. Overall the traditional teaching method is interesting and effective.”

“Wish we had a combination of the two methods for some of our tough chapters. It will help us understand them better.”
add-on modality of teaching gives us an insight to think of moving toward the desirable change. Blended learning may be a good future option.\[14-16\]

One of the limitations of our study was that it focused on a single topic like several earlier studies.\[5,6\] However, we could have carried out our study on more than one topic as has been tried earlier in the past.\[4\] Hence, more studies need to be done before we can come to clear derivations because the way in which teaching instructions are delivered may have to be structured not only on the basis of student preferences but also as per the requirement of a given topic. It is important that we tailor our instructions based on several factors such as student baseline knowledge whether they are novices such as undergraduate students or postgraduate students and the difficulty level of the topic being taught.

**Conclusion**

Although superiority of one method over the other was not established, up to 90% of the students graded e-module as either satisfactory to good. Most felt that lecture followed by sharing of an e-module will help them to learn better. Hence, a blended learning module can be a good option, worth exploring in near future.

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**Conflicts of interest**

There are no conflicts of interest.

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