

Didactic Versus Interactive Lectures: A Comparative Study to Assess the Perception and Learning among Second Year Medical Undergraduate Students

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Abstract

Introduction: It is common knowledge that instruction in the form of didactic lectures can prove monotonous, unidirectional and less interest evoking for students. The subject of Pharmacology is no exception to this. The incorporation of interactive elements within a didactic teaching setting has been shown to positively impact the learning and comprehension of the students. A didactic teaching session may also hamper the instructor’s efforts to cater to student populations of varying capabilities and needs. Thus, this study was undertaken to evaluate the comparative effects of didactic versus interactive teaching sessions on learning outcomes of students and the acceptability of the same in a given setup.

Objectives

1. To compare the perception of students about the active and passive methods of teaching.
2. Impact of the active and passive methods on student cognitive learning outcomes.

Methodology: Students of the second year MBBS were exposed to two teaching methods i.e. classical didactic lecture and interactive lecture in small groups in succession. The perception of the students about the was obtained at the end of the session by a prevalidated 10 item questionnaire. They were tested at the end of both the sessions to assess the immediate understanding and comprehension of the students by both the methods. The same test was repeated after a month to check the impact of both the methods on retention or long-term memory.

Results: More than 75% students in this study opined that, the interactive lecture caused them to be more attentive, interested and stimulated and resulted in better understanding of the topic covered. They also believed this led to greater and more fruitful interaction with both the teacher and other students and were desirous of more such interactive sessions in the successive classes. In the short term, the interactive sessions were observed to produce a statistically significant enhancement in comprehension of the topic as compared to the didactic lecture. Assessment of students in the long term i.e. after a month, also showed enhanced comprehension; however it was not statistically significant.

Discussion: Besides an actual comparison of two teaching methods, this study helped to understand the feasibility and acceptability of the newer teaching learning method in our established set up. The support and encouragement obtained from the faculty members as well as students in this study would facilitate the introduction of such newer and more interactive strategies in medical education. This study demonstrates an enhanced effectiveness of interactive teaching methods versus didactic sessions on the learning outcomes of the students and this is in line with findings of other such studies. As this study could not prove a significant improvement in the intermediate level cognitive outcome; it needs a further evaluation for the factors and methods to produce the desired impact on the intermediate as well as long term learning patterns of medical undergraduates.

Conclusion: The interactive teaching learning methods are well accepted and effective compared to simple didactic lectures. Though the advantages of didactic lectures like teaching multiple subtopics simultaneously to large group of students which is convenient and

economical to the institute cannot be overlooked, teaching methods can be devised to optimise the maximal benefits of both the approaches.

Keywords: Perception, active and passive learning, Learning outcomes.

Introduction

The medical field and treatment of the various ailments has revolutionised over the past few years. With changing times, a lot of new discoveries are taking place every now and then. It has affected and changed the attitude with which medical information and subject knowledge is being imparted to the students. The evolution and acceptance of newer teaching-learning methods has created numerous opportunities for the contemporary medical educator.

Didactic lectures for a large group of students are still considered as an important and convenient method of knowledge transfer.¹ It has its own advantages, in the form of covering a large group of students, in a limited time period. In countries like India with limited resources, it is a very convenient and resource-effective teaching method. The attention span of students usually lasts for 20-25 minutes, after which the one-way didactic lecture fails to engage their attention any further. To further clarify the concepts taught in the didactic lecture and to stimulate self-learning in the students, tutorials are an important teaching learning tool. But the availability of staff, time constraints and preparedness of students are some of the obstacles in the successful implementation of the tutorials.

Active participation of the students during the lecture is assumed to keep them more attentive throughout the session and help in creation of long-term memory.²

It is paramount for a teacher to address the intellectual diversity of the students in any class during the lectures.

Students imbibe imparted knowledge at varying paces. It is the slow learners who require more attention. Also, based upon their inherent nature, an extroverted pupil will not hesitate to seek clarifications whereas their introverted counterparts may shy away from the same. Hence, one of the biggest challenges for medical educator is to make the session equally effective and engaging for all student subgroups.

The policy makers in the field of medical education are now laying greater emphasis on smaller groups and more interactive teaching. This is a welcome and necessary change especially in a profession of this nature.

As a result of this, the approach now is more student centred, where it is desired that the students will actively participate in the learning process and the role of teacher becomes more of a facilitator than an instructor.³ If students are actively involved in the teaching learning process, it may probably increase their attention span, arouse greater interest in the topic, enhance retention of the concepts, all of which should ultimately translate into improved grades of the students in the formative and summative assessments.^{4, 5}

Smaller group interaction can be an effective way to draw the more silent / hesitant students into the main discussion. Such groups of students can be made more interactive with discussions, quizzes, games and other activities, which will help students think, reason, listen to others and work as a team.⁶

This study was planned to primarily assess the perception of second year medical students with respect to existing and newer experimental teaching methods. The comparative impact of both such methods on understanding and retention of the said students will also be assessed.

Materials and Methods

Approval from the Institutional Ethics Committee was sought and obtained prior to commencement of the study. Second year medical undergraduate students from our institution were the subjects. They were briefed that their participation was entirely voluntary and a written informed consent was obtained from students before initiating the study. The students were assured that their non participation would have no bearing either on their access to learning resources or assessments and that the scores obtained by them in the tests during study would be used only for the research purpose and that would not affect their internal assessment marks. A sample size estimation was done at the initiation of the study. With the assumption of loss to follow-up of about 10%, a sample size of 50 was calculated.

Two topics of comparable difficulty and equivalent assessment weightage were identified. Each topic was prepared as a didactic session as well as one with interactive elements. The two topics chosen were namely, Insulins and Oral antidiabetic medications. (OAD).

Although the ideal method of randomization of the study groups is the use of a random number table but purely for feasibility purposes, the entire batch was divided into first and second half, assuming there will be random distribution of students with varying intelligence.

Group A: Roll No. 1-25

Group B: Roll No. 26-50

- On Day 1, both the batches A and B received a didactic session by faculties 1 and 2.
- On Day 2, faculty members delivered a session on the same topic to the other student group in the interactive manner.

Table 1: Flowchart of activity

	Group	Topic	Teacher	Method of teaching
First contact	A	Insulin	1	Didactic lecture
	B	Oral antidiabetic medications (OAD)	2	Didactic lecture
Second contact	B	Insulin	1	Interactive lecture
	A	Oral antidiabetic medications (OAD)	2	Interactive lecture

Hence, the students were subjected to two sessions delivered in a different manner. The use of the same topic could not be made as it would have interfered with accurate assessment due to a possible reinforcement phenomenon happening in the second session. In order to ensure uniformity, the faculty member for one topic remained the same for both the didactic and interactive sessions.

The time allotted for the didactic lecture and interactive lecture was the same i.e. 50 minutes. For the interactive lecture, each batch of 25 was divided in to 5 groups of 5 students each and different students were asked to perform different activities in every group. The activities used for interactive sessions included multiple choice questions, Case scenarios, Concept test, Think-Pair-Share, Brainstorming.

At the end of Interactive as well as the Didactic lecture, students' perceptions and comprehension were recorded using qualitative and quantitative methods.

The perception of the students was recorded using a prevalidated anonymous questionnaire about the acceptability, adequacy and effectiveness of both the methods as teaching tools. Students were guided to choose an option from a Likert-type scale of 1–5 (where 1 = “Strongly disagree”, 2 = “Disagree” 3 = “Equivocal”, 4 = “Agree” and 5 = “Strongly Agree”). At the end of the questionnaire there was a provision to write additional comments about the teaching method, the responses to which were analysed separately.

To assess the effectiveness of the teaching method a quantitative test was conducted at the end of both didactic as well as interactive sessions. The test administered was of twenty minutes duration and comprised of ten multiple choice questions and two short answer questions evaluating the knowledge and problem-solving ability of the students based on the topic. To check the effect of the teaching methods on retention of the concepts, the same tests were repeated after a month without prior intimation to avoid any kind of bias or interference in the results.

Interactive sessions needed a lot of preparation in terms of manpower, time and logistics. Thus, it was important to take feedback from the faculty members who were actively involved in the conduct of this study.

Statistical Analysis

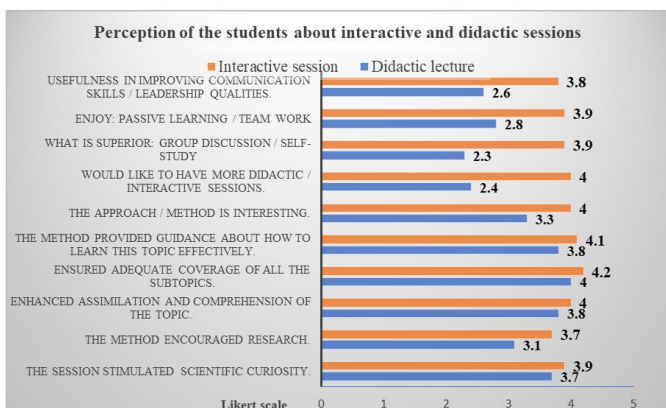
The responses of the students were recorded in the MS office and analysed. In this study each group was exposed to both the methods of instructions, hence the outcomes were compared within the group using Wilcoxon matched-pairs signed-ranks test. GraphPad Quickcals programme was used for the statistical analysis.

Results

Out of 50 second year MBBS students who consented for the participation in the study, 45 students were present for both the interventions as well as a repeat test after a month. Hence perceptions and results of only these students were considered for analysis.

There was a significant difference in the perception of students regarding the teaching learning methods used in the study as shown in Figure 1. More than 75% students in this study opined that, as compared to a didactic lecture, an interactive session caused them to be more attentive, interested and stimulated and led to a better understanding of the chapter. Around 72% students opined that there should be more interactive sessions.

Figure 1: Perception of the students about interactive and didactic sessions



Majority of students (60%) liked working in a small group as it permitted more interaction with teachers, colleagues and led to better exchange of ideas. The smaller group size encouraged the usually quiet and introverted students also to open up and participate enthusiastically.

Table 2: Mean scores of the students in the post intervention test and retention test after one month

Tests	N	Mean Score (Out of 20)	SD	SEM	p value
Didactic	45	11.31	3.33	0.50	0.01

(D-1)					
Interactive (I-1)	45	12.99	3.01	0.45	0.78
Didactic (one month later) (D-2)	45	6.36	3.89	0.58	
Interactive (one month later) (I-2)	45	6.58	3.82	0.57	

Table 2 shows the mean scores obtained by the students in the quantitative assessment of the teaching learning tools. The difference between the scores obtained in the tests conducted at the end of didactic lecture and the interactive lecture (D1 and I1 respectively) was statistically significant (p value - 0.01). It shows that there was better understanding of the topic through the interactive session.

Table 3: Difference in the intermediate outcome by two methods

Tests	N	Mean Score	SD	SEM	p value
Retention by Didactic (D1-D2)	45	4.95	3.75	0.55	0.05
Retention by Interactive (I1-I2)	45	6.41	3.43	0.51	

The retention of the knowledge by both the methods was also tested of the same topics after a period of one month. The scores obtained in the interactive topic were little higher than didactic topic after a month and the difference was statistically significant (p value 0.05). (Table 3)

The feedback from the faculty was quite positive and supportive to interactive teaching. Although there were time and manpower constraints, as shown in table 3.

Table 4: Feedback from the faculty regarding interactive sessions

Advantages	Limitations
Generates more interest in topic	More preparation intensive
Enhanced participation of students	Difficult to complete the topic in given time while incorporating additional activities
Triggered greater logical thinking, stimulated research attitude	Active student participation required
Inclusive attitude, encouraged interaction and healthy competition between various groups	Infrastructural constraints

Discussion

The present study was conducted to evaluate the perception, effectiveness, feasibility and acceptability of interactive teaching methods in our institution. The assessment of effectiveness of these interactive teaching methods on the learning outcomes of the students showed that there was significant improvement in the immediate understanding as well as retention of the knowledge of the students which is well documented in the literature. Many researchers like Sukhlecha Anupama¹, Costa ML⁷ and Nieminen J⁸ obtained similar findings and opine that knowledge retention improves with interactive teaching-learning. Certain other studies showed that students were in favour of interactive sessions, however the outcomes as compared to didactic sessions were not statistically different.⁹

In the present study, the students had a very favourable opinion about interactive teaching methods. More than 75% students commented that didactic lectures can be, at least in part, replaced by interactive sessions, which was similar to the study done by Yvonne Steinert¹⁰ But, in some studies like Mahinda K.¹¹ students preferred traditional methods over student activity especially for tutorials. In our study though the interactive sessions had active student participation, the discussion was mainly driven by the teacher, unlike in some studies of student led learning approach, the teachers only played the role of facilitator or moderator.¹

The faculty members also displayed a favourable opinion about interactive teaching, considering the improved interest and attention of students during the class. Teachers have to invest considerable time in preparation of such activities. Also, introduction of such activities takes a toll on covering the allotted portion of the lecture.⁵ Considering the pros and cons, during departmental meetings it was opined that some classes on important topics can be introduced as interactive sessions during the annual curriculum.

As per the opinion of the students, team work, inclusive attitude, improved presentation skills and acquiring leadership qualities are certain perceived advantages of interactive sessions. Many other studies involving student interaction had resulted in similar findings^{1,11}

The advantages of didactic lectures like covering multiple subtopics simultaneously to a large group of students which is convenient and economical to the institute can not be overlooked. Thus, the better approach would be incorporation of interactivity into regular didactic lectures, thus optimizing the outcomes.

Conclusion

Interactive teaching learning methods aroused interest and curiosity among learners leading to better understanding of the subject. It reflected as the improvement in the short term learning outcomes of the undergraduate medical students. In order to draw further conclusions and assess the impact on long term learning outcomes, more research must be undertaken including more topics, multiple subjects analysing variable interactivity tools on a larger scale.

Limitations

Limited human resources and time constraints are the important limitations in introducing multiple interactivity sessions during the academic year.

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