www.aujmsr.com

ScientificScholar®
Knowledge is power
Publisher of Scientific Journals

Adesh University Journal of Medical Sciences & Research

Review Article

Interactive teaching in medical education: Experiences and barriers

Anjana Verma[1], Ashish Patyal[2], Jitendra Kumar Meena[3], Medha Mathur[1], Navgeet Mathur[4]

[1]Department of Community Medicine, Geetanjali Medical College, Udaipur, Rajasthan, India, [2]Department of Neuroanaesthesia, Walton Centre, Liverpool, United Kingdom, [3]Department of Preventive Oncology, National Cancer Institute, Jhajjar, Haryana, All India Institute of Medical Sciences, New Delhi, [4]Department of Medicine, Geetanjali Medical College, Udaipur, Rajasthan, India.

***Corresponding author:**
Anjana Verma,
Department of Community Medicine, Geetanjali Medical College, Udaipur, Rajasthan, India.

anjanaverma504@gmail.com

Received: 10 April 2021
Accepted: 27 July 2021
EPub Ahead of Print: 21 August 2021
Published: 29 December 2021

DOI
10.25259/AUJMSR_13_2021

Quick Response Code:

ABSTRACT

An interactive teaching method is a form of learning and communicative activity, which focuses on students' needs and allows them to actively participate in the learning process. With the introduction of competency based medical education (CBME), new teaching methods have been introduced to ensure the attainment of competencies by medical graduates. Research shows that interactive activity in class is an effective teaching learning method. There are many studies which have reported that students prefer interactive lectures based on active learning principles. Despite this, it has been found that many students do not engage with active learning exercise, which is probably due to the reason that among students, there is an already established culture of teaching and learning. The interactive lectures need to be designed after exploring student expectations, feedback, and experiences. Faculty members too have their own skepticism about the use of innovative methods in their teaching. These challenges need to be addressed for successful implementation of CBME based curriculum in medical education. With this review, we present the experiences about the use of interactive teaching methods in the field of medical education and also point out various barriers and challenges on the path of its execution.

Keywords: Interactive teaching, Competency based medical education, Medical education, Barriers, Challenges

INTRODUCTION

Lecture is one of the most commonly used methods of teaching in medical education. However, the one-way communication during lectures does not influence the students' behavior. It leads to loss of interest in the topic among students, who are supposed to be the future competent doctors. Introducing interactive techniques during lecture can promote learner participation and as a result, can lead to a higher level of learning. Interaction between teacher and students is must for improving the traditional teaching methods like lectures. Interactivity can promote active learning, improves motivation as well as attention and can gives feedback to both teacher and student.[1] Interactive learning activities actively engage the listener, and encourage the students for self-directed learning. They will be more attentive and motivated during interactive lectures.[2] Interactive teaching can be done using large group, small groups, pairs, and individuals. Methods used in the study are think-pair-share, buzz sessions, case-based learning, and pass the problem.[3]

For decades, educationalists in India have been working towards the introduction of competency based medical education curriculum in the country. Medical regulatory body has approved the

transition from traditional to new curriculum starting from 2019 academic year. With this reform in medical education, there have been challenges and hurdles in its implementation across all medical colleges in the country. This study highlights the experiences of interactive teaching in medical education and various challenges in its implementation.

EXPERIENCES FROM IMPLEMENTATION OF INTERACTIVE TEACHING IN MEDICAL EDUCATION

Experiences from abroad

Studies around the world have shown that interactive teaching is a reform in medical education toward effective learning. A quasi-experimental study by Ali *et al.* was conducted among university students in Jordan to assess the usefulness of interactive teaching in promoting awareness about reproductive health. Since health education at teaching institutes is a cost-effective and ideal method of developing healthy lifestyles, researchers assessed the effectiveness of interactive teaching method to educate youth about reproductive health in conservative societies like Jordan. The faculty delivering interactive lectures for promoting reproductive health was trained about the teaching methods such as brainstorming, group discussion, debate, educational games, and reflections on real life stories. Interactive teaching sessions were given to students as 60-min session/day, for 4 weeks. This study revealed a significant improvement in students' knowledge and attitudes, when post-test scores were compared with pre test scores. Authors suggested that reproductive health should be integrated into university's curriculum and should be taught with interactive learning approach.[4] This study implies that interactive teaching method is a better way of facilitating higher level of thinking and extending the learning to affective domain as well. The affective domain is one of the vital areas of the learning outcomes of medical students, other than cognitive and psychomotor domains. Studies in education have demonstrated that students who are actively involved in the teaching-learning session learn more than the students who are just passive recipients of knowledge. Interactive lecturing encourages the evaluation of the subject content, application to other types of situations and evaluation of the material presented. It can facilitate problem-solving, decision-making, and communication skills. This is particularly important in medical education where the application of knowledge is as important as the retention and recall of facts.[5] Apart from interaction between teacher and students, when there is interaction within a group of students to define their own learning objectives, it is called problem-based learning (PBL). In PBL, students use "triggers" from the presented problem case or scenario and construct their learning objectives. Afterward, students independently do self-directed study and gather as a group to discuss and refine their acquired knowledge.[6] PBL is an active way of learning but its implementation in developing countries has some hurdles because large number of students have to be managed with minimum resources. Alaaqib *et al.* evaluated and compared the effectiveness of lectures based on problems (LBP) and traditional lectures (TLs) in physiology teaching in a medical college in Sudan. Equal number of lectures was given as LBP and as TL in the course. Post-test assessment of students was taken through quiz sessions and scores were used to compare the effectiveness of the two types of lectures. A structured questionnaire was used to assess students' perceptions and satisfaction about LBP. The results revealed that students had significantly better retention during LBP and more active role than TL ($P < 0.01$). About 64% of students found LBP more interesting and believed that it improved their understanding of physiology concepts. The post-test scores of students in quiz sessions of LBP were significantly better than that of TL ($P < 0.01$).[7]

In today's world, technology is a powerful tool for educators to make their teaching more creative, interactive, and more engaging. Flipped classroom (FC) is a teaching approach in which direct instruction moves from the group learning space to the individual learning space, and the classroom is transformed into a dynamic, interactive learning environment where the teacher guides the students as they apply concepts and engage creatively in the subject matter.[8] Traditional teaching method and FC approaches were compared by Limniou *et al.*, under the perspectives of Higher Order Thinking Skills (HOTS) development among 1st year psychology students in Liverpool, United Kingdom. In this study, it was revealed that there was a significant difference in students' views about the teachers' contribution to teaching learning approach, students' HOTS development, and choice of learning material. This study concluded the importance of the relationship between choice of learning material and the teacher's contribution to the FC session and their attitudes toward technology.[9] A randomized controlled trial by de Jong was conducted to assess the effectiveness of interactive seminars or small group tutorials among undergraduate medical students in Leiden Medical School, the Netherlands. Educational effectiveness was measured by comparing the students' results on the end-of-block test. Students' perceptions and satisfaction data were collected by means of questionnaires. The study revealed that retention of knowledge through active participation was the most frequently cited reason for preferring small group tutorials, a dislike of compulsory course components was mentioned more frequently by students preferring interactive seminars. Small group tutorials led to greater satisfaction.[10] Another research done by McLaughlin *et al.* used the FC as a course redesign to foster learning and engagement in a health professions school. Researchers offloaded all lectures to

self-paced online videos and used the class time to engage students in active learning exercises. This study revealed that after participation in FC, class attendance as well as students' learning improved. The authors concluded that this approach warrants careful consideration as educators aim to enhance learning, improve outcomes, and fully equip students to address present day healthcare needs.[11] A study by Missildine *et al*. aimed to determine the effects of innovative learning activities on academic success and the satisfaction among nursing students. A quasi-experimental design was used to compare three teaching learning methods: TL only (LO), lecture and lecture capture back-up, and FC approach of lecture capture with innovative classroom activities (LCI). The study revealed that examination scores were higher for the FC LCI group (Mean = 81.89 ± SD 5.02) than for both the LLC group (Mean = 80.70 ± SD 4.25), $P = 0.003$, and the LO group (Mean = 79.79 ± SD = 4.51), $P < 0.001$. However, it was found that students were less satisfied with the FC method than with either of the other methods ($P < 0.001$). Authors concluded that combining new teaching approaches with interactive classroom activities can result in improved learning but not necessarily improved the students' satisfaction.[12]

Experiences from India

The Medical Council of India recommended new curriculum for undergraduate medical education emphasizing on competencies, in a move toward competency based medical education. It deals with the application of current educational methodologies to bring about medical educational reforms and prioritizes learner centric methods of instruction. In a resource limited country like India, to bring about reforms in medical education is a difficult process. It has implications for staffing and learning resources and demands a different approach to workload and assessment. Findings of the educational research done in India reinforce the need to implement learner centric and interactive teaching methods in medical curriculum. Begum *et al*. conducted an interventional study to compare the effectiveness of interactive teaching learning (ITL) and traditional teaching learning methods among undergraduate medical students in Andhra Pradesh. This study also assessed the perception of students and faculty toward it. Results showed that there was an increase in performance of students in the intervention group with significantly better scores than the students in traditional teaching group. Students and faculty found interactive teaching better than traditional methods.[13] In another study from Maharashtra, Buch *et al*. used a number of interactive teaching methods such as brain storming, group discussions, question answer sessions, multiple choice questions (MCQs), confusion technique, and summaries. among 150 medical students. A pre validated questionnaire was used to assess the perceptions of students about new methods, using the Likert scale. Most (>70%) of the students liked the sessions. Majority (75%) of the students found MCQs (76% completely agreed) to be the most popular ITL method, followed by brainstorming (64% completely agreed) and confusion technique (53% completely agreed). Most of the students believed that interactive teaching helped in improving attention span, communication skills, better retention of the topic and suggested that such teaching method should be regularly used during lectures.[14] Roopa *et al*. did an evaluation of the type of lectures dental students prefer in a college in Tamil Nadu. The students were exposed to both regular and interactive lectures. Out of the total 12 lectures, alternate lectures were interactive. Students' feedback was obtained at the end of the 12-lecture series. About 92% students found interactive lectures to be more useful. Interactive lectures were found to be more useful than regular lectures by 92% of the students. Majority of the students either agreed or strongly agreed that they were more attentive and motivated during interactive lecture. Students also found interactive teaching to be non-monotonous and well-defined learning method. Out of the different techniques, most liked one was use of video clippings (58.1%).[15] A prospective longitudinal study was conducted in Maharashtra by Datta *et al*., among 192 students to compare the conventional versus interactive teaching with a series of twenty lectures. An independent observer was used to keep record of the number of interactions in each class. After analyzing the results, it was found that pre-test scores from both the groups were similar and post-test scores improved in both groups. However, there was a significant difference in the post-test scores between two groups ($P < 0.05$). The post-test score of interactive lectures was better than conventional post-test score by 9.24% (95% Confidence Interval: 8.2–10.3%) ($P < 0.01$). Furthermore, the retention test score after interactive sessions was better than conventional retention test score ($P < 0.001$) by 15–18.2% (95% Confidence Interval: 15.0–16.64%) ($P < 0.01$). There were 51 participative events in the interactive group as compared to 25 in the conventional group.[16]

Kumar *et al*. conducted a cross-sectional study among VIIth semester medical students to study the effectiveness of tutorials as an interactive method of teaching undergraduate students in Pondicherry. Students were divided into six groups and tutorial session was conducted by trained faculty. Feedback from students was taken through a predesigned pretested questionnaire using Likert scale. Most of students (63.4%) revealed that they understood the topic better in tutorial session. About 69% of students felt time management was better in a tutorial as compared to lecture.[17]

Another study done by Cheema and Arora among 150 medical students of a medical college in Jalandhar, Punjab to evaluate the effectiveness of interactive lectures as teaching

method in Obstetrics and Gynaecology, demonstrated that interactive methods stimulate self-directed learning among students.[18]

A study done in the state of Meghalaya, Panda *et al*. compared three types of interactive teaching methods: Flipped class room; MCQ based interactive teaching; and Confusion technique Kirkpatrick level 1 evaluation. This academic study was conducted for a period of 1 year with medical students. Twelve topics were selected to be included in the study. Out of the total 12 topics, four topics were taught in FC technique, another four were taught with MCQs in the class and remaining four topics were taught using confusion technique. Feedback was obtained from students with the post-test questionnaire using Likert chart. The study revealed that students preferred FC technique of teaching followed by MCQ technique and confusion technique.[19]

In Karnataka, Angadi *et al*. did an interventional study with 98 students, divided into two batches of flipped class and conventional small group teaching. FC involves providing study resource material to students, outside the class so that class time is used for instructional activities. This study was done to assess the effectiveness of FC activity as an interactive teaching-learning method. For the flipped class, an online Google group was created. Brief introduction and pre-recorded videos related to the assigned topic were posted in the Google group, followed by discussion in the form of problem-solving exercises. Study showed that there was a significant difference between the post-test scores of each session and also the mean scores of summative tests between two groups ($P < 0.001$). About 82% of the study participants strongly agreed that FC session was more engaging and interesting in comparison to TL. Majority (76%) strongly agreed that more such classes (FC) should be conducted in the future.[20]

BARRIERS TO INTERACTIVE TEACHING

The role of teacher is changing from keeper of knowledge to coordinator of learning which presents a challenge for educators to dramatically change the way their students learn. Whereas most teachers agree with theoretical benefits of interactive lectures, many might not engage in such lectures for a number of reasons. Most frequently, teachers mention a scepticism of losing control while delivering the lecture.[3] Doubts about not covering all of the material, or of losing time to less important content, is another commonly endured lament. It is a fact that the "number of facts" or "amount of information" need to be reduced to deliver an interactive lecture; another well-known fact is that if we present too much information, students will retain less.[21] Another common reason for hesitancy to deliver an interactive lecture is time constraint. Audience expectations, subject matter and the physical setting may also hinder an attempt to be interactive.

In developing countries, limited resources may pose further challenges in the implementation of interactive teaching. Many teachers are of opinion that the basic sciences cannot be taught interactively, and that it is comparatively easier to teach the clinical sciences using interactive format. Others believe that higher order thinking is required for interactive teaching and undergraduate students, because of their more limited knowledge, cannot participate in an interactive lecture.[3] However, the published literature and teaching experiences do not support this position. The use of educational technology in medical education is consistently expanding. The new curriculum mandates integrating new technology into the teaching methods. However, the exact impact of these methods on educational outcomes is yet to be determined in long run. There are many challenges in the practical use of interactive learning technology despite sufficient research in the field. There is also the possibility of poor integration of new technology with other educational activities. Technology can produce substantial educational benefits when incorporated in the curriculum in a collaborative manner.

WAYS TO IMPROVE INTERACTIVITY IN LECTURES

The lecture still is one of the most widely used teaching methods in classes, and there are strategies teachers can utilize that will help to engage students around the lecture content. One of the methods is to incorporate interactivity into the lecture. Strategies for interactivity can be either technology based or can be implemented in a shared, real-time social setting. Technology based strategies range from using visual cues embedded in PowerPoint to use of social media platform. On the other hand, simple interaction strategies that require no use of technology include stopping for a show of hands or building in time to turn to your neighbor and discuss. These sorts of strategies balance out a lecture listening activity with a discreetly placed lecture responding (interacting) activity. The social dynamics of learning can be used to enhance the learning experience. The social interaction directly controls learner engagement and can be leveraged to enhance learner's efficiency and to find solutions to complex learning problems. The interactivity in teaching can be effective if incorporated with proper assessment. Where possible, a variety of socially interactive learning assessments includes group assignments and peer marking. In socially interactive learning assessments, a self-reflective element should be included that requires students to examine the social dynamics of the assessment, and the impact it has on their learning and thinking.[22]

CONCLUSION

Studying with interactive activities is a great source of learning especially when they are incorporated with specific

educational components and outcomes. It is accepted by almost all teacher communities around the world that interactive teaching methods help in self-directed learning among students and better retention of topic. Interactive teaching methods modify the role of a teacher from provider of information to the facilitator of educational process. Although there are certain challenges and barriers in implementation of interactive teaching in medical curriculum, they can be addressed with proper planning and training of stake holders.

Acknowledgment

The authors are thankful to the scholars, whose articles are cited in the text and faculty members of Medical Education Unit.

Declaration of patient consent

Patient's consent not required as there are no patients in this study.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Nasmith L, Steinert Y. The evaluation of a workshop to promote interactive lecturing. Teach Learn Med 2001;13:43-8.
2. Kaur D, Singh J, Seema MA, Mahajan A, Kaur G. Role of interactive teaching in medical education. Int J Basic Appl Med Sci 2011;1:54-60.
3. Snell YS. Interactive lecturing: Strategies for increasing participation in large group presentations. Med Teach 1999;21:37-42.
4. Ali RA, Alnatour A, Alnuaimi K, Alzoubi F, Almomani M, Othman A. Effects of interactive teaching on university students' knowledge and attitude toward reproductive health: A pilot study in Jordan. J Multidiscip Healthc 2018;11:211-21.
5. Pagatpatan CP Jr., Valdezco JA, Lauron JD. Teaching the affective domain in community-based medical education: A scoping review. Med Teach 2020;42:507-14.
6. Wood DF. Problem based learning. BMJ 2003;326:328-30.
7. Alaagib NA, Musa OA, Saeed AM. Comparison of the effectiveness of lectures based on problems and traditional lectures in physiology teaching in Sudan. BMC Med Educ 2019;19:1-8.
8. Ozdamli F, Asiksoy G. Flipped classroom approach. World J Educ Technol 2016;8:98-105.
9. Limniou M, Schermbrucker I, Lyons M. Traditional and flipped classroom approaches delivered by two different teachers: The student perspective. Educ Inf Technol 2018;23:797-817.
10. de Jong Z, van Nies JA, Peters SW, Vink S, Dekker FW, Scherpbier A. Interactive seminars or small group tutorials in preclinical medical education: Results of a randomized controlled trial. BMC Med Educ 2010;10:79.
11. McLaughlin JE, Roth MT, Glatt DM, Gharkholonarehe N, Davidson CA, Griffin LM, *et al*. The flipped classroom: A course redesign to foster learning and engagement in a health professions school. Acad Med 2014;89:236-43.
12. Missildine K, Fountain R, Summers L, Gosselin K. Flipping the classroom to improve student performance and satisfaction. J Nurs Educ 2013;52:597-9.
13. Begum J, Ali SI, Panda M. Introduction of interactive teaching for undergraduate students in community medicine. Indian J Community Med 2020;45:72-6.
14. Buch AC, Chandanwale SS, Bamnikar SA. Interactive teaching: Understanding perspectives of II MBBS students in pathology. Med J DY Patil Univ 2014;7:693-5.
15. Roopa S, Geetha MB, Rani A, Chacko T. What type of lectures students want?-A reaction evaluation of dental students. J Clin Diagn Res 2013;7:2244-6.
16. Datta R, Datta K, Venkatesh MD. Evaluation of interactive teaching for undergraduate medical students using a classroom interactive response system in India. Med J Armed Forces India 2015;71:239-45.
17. Kumar RP, Kandhasamy K, Chauhan RC, Bazroy J, Purty AJ, Singh Z. Tutorials: An effective and interactive method of teaching undergraduate medical students. Int J Community Med Pub Health 2016;3:2593-5.
18. Cheema HK, Arora R. Effectiveness of interactive lectures as teaching methodology in OBG among final year medical students. J Evol Med Dent Sci 2019;8:1563-72.
19. Panda S, Das A, Baruah SR, Baruah L. Analysis of different interactive teaching methodology. Int J Innov Res Med Sci 2020;5:41-5.
20. Angadi NB, Kavi A, Shetty K, Hashilkar NK. Effectiveness of flipped classroom as a teaching–learning method among undergraduate medical students-an interventional study. J Educ Health Promot 2019;8:211.
21. McKeachie WJ. Teaching Tips: A Guidebook for the Beginning College Teacher. 8th ed. Washington, DC: Lexington; 1986. p. 353.
22. Nugent A, Lodge JM, Carroll A, Bagraith R, MacMahon S, Matthews KE, *et al*. Higher Education Learning Framework: An Evidence Informed Model for University Learning. Brisbane: The University of Queensland; 2019. p. 23-8.

How to cite this article: Verma A, Patyal A, Meena JK, Mathur M, Mathur N. Interactive teaching in medical education: Experiences and barriers. Adesh Univ J Med Sci Res 2021;3:69-73.