

## Assessment of Undergraduate Medical Students' Perceptions of Novel Teaching Techniques Used in Pharmacology Involving Their Active Participation

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### Abstract

**Introduction:** The choice of teaching technique is one of the most important factors in the successful implementation of medical education. There is a need to try out novel teaching techniques that can involve the active participation of students to overcome the challenges of passive techniques like didactic lectures.

**Methods:** The study involved a total of 180 second MBBS students who were divided into two groups of 90 students each to carry out one of the two activities, i.e. Students' Corner or Symposium. The first group of students was told to submit one article each on the pharmacology topics in the form of short essays, crosswords, mnemonics, case studies, diagrams, flow charts, MCQs, etc. The second group was told to prepare and present a symposium in front of their peers. The pharmacology topics were allotted by the faculty. At the end of the academic year, feedback from all the participants was taken using a pre-validated questionnaire.

**Results:** The perception of students was extremely positive for these new teaching techniques. Majority of them agreed that both activities helped them in a better understanding of the topic. Students' Corner encouraged interest & creativity and helped in revising topics while the symposium helped in learning teamwork and public speaking. However, more than half of the students who contributed to the students' corner thought that the activity was monotonous and about 2/5th of students thought that these activities were unnecessary.

**Conclusion:** Novel teaching activities involving the active participation of students are effective and helpful in learning, they can be used as a supplement to the traditional methods.

**Keywords:** Symposium, Students' Corner, Teaching learning method, Innovative.

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### Introduction

Medical education has undergone a massive change in the last few decades, with more focus now on interactive learning techniques that are centered on students.[1-3] Accomplishment of medical education depends on various factors like the medical teachers, students, study hours, and the style of teaching to name a few.[4,5] Medical education doesn't only deal with keeping the learning techniques up to date, but also inculcating self-discipline in the students during the process of learning.[6] One of the most important factors that define the successful implementation of medical education is the choice of teaching technique.[7] Didactic lectures mostly comprise an authoritative teacher speaking in front of a passive audience. This technique has a few disadvantages which include

burdening teachers with the whole teaching responsibility, teaching flow being one-way, and limited opportunities for students to solve their doubts as well as to provide feedback.[8] Hence, there is a need to try out novel teaching techniques which can involve the students actively.

Pharmacology is one of the most important subjects in the MBBS curriculum as it forms the basis of understanding drugs, which is the foundation of medical graduation. It is important to teach the students about the drugs in the correct and best way so that they learn to prescribe them in the most rational way possible.[9,10] Didactic lectures may get boring many times considering the factual nature of the drugs and hence, the subject of Pharmacology

provides great scope for trying out new promising teaching and learning techniques.

Two such new techniques that can be considered for potential implementation in teaching are students' corner and symposium. Students' Corner involves the active participation of undergraduate students wherein they are told to provide multiple choice questions (MCQs), puzzles, or fun facts related to the subject of Pharmacology. The articles were printed and displayed on the notice board in the department specially reserved for this activity so that the other students can see, read, and discuss these articles. Symposia involves the making of multiple sub-groups who will be given a Pharmacological topic, on which they have to coordinate with the facilitator and make a PowerPoint presentation, which they are told to present in front of the other students of their batch. We couldn't find any study that has evaluated the attitude and perception of undergraduate students for these novel teaching techniques. Hence, we decided to conduct a questionnaire-based study to assess and compare students' perceptions of Students' Corners and symposia as a teaching tool among second-year undergraduate MBBS students in a medical college.

#### Methods:

The study was conducted at the Department of Pharmacology and Therapeutics, Seth GS Medical College, Mumbai, after obtaining the institutional ethics committee approval. The study was conducted between August 2016 to December 2017. At the beginning of the academic year, the students. The concepts of Students' Corner and Symposium were introduced at the beginning of the academic year and 180 undergraduate students studying in the 2<sup>nd</sup> MBBS were divided into the following two groups of 90 students each according to their roll numbers.

##### i) Students' Corner (n=90):

The students were told to submit one article each as per their roll numbers on the pharmacology topics already covered in their lectures in the form of short articles, crosswords, mnemonics, case studies, diagrams, flow charts, match the following, MCQs, fill in the blanks, word search, true or false, poem, cartoons or any other innovative ways. The students were given the guidelines on formatting like font type, font size, spacing, margins, etc. They were free to approach the teachers in case of any difficulty. The articles were printed and displayed on the notice board after the teacher's approval for 15 days so that other students could read them in their free time.

##### ii) Symposium (n=90):

Students were assorted into 9 sub-groups containing 10 students each. Each sub-group was then assigned one topic in pharmacology and was told to prepare and present a symposium of approximately 60

minutes in front of their peers. Two faculty members from the Department of Pharmacology were allotted as facilitators to each group; however, no direct input was provided by them. Thus, there were 9 different symposia conducted on different topics in Pharmacology over one year. After their presentation, the facilitators provided their input on the topic and concluded the session.

At the end of the academic year, all the participant students were given a feedback form to assess their perception regarding the adequacy and relevance of one of the teaching techniques in which they participated actively using a pre-validated questionnaire anonymously. These questionnaires used mainly 3-point Likert items for the assessment (Disagree, Neutral, and Agree) and open-ended questions, which invited their suggestions for further improvement.

**Statistical Analysis:** The results were presented using descriptive statistics. The responses to various questions were represented as percentages. The inferences over questions were drawn based on these responses.

#### Results:

In this study, 180 students were divided into two groups of 90 students each, one group who had contributed to the Students' Corner and the other group who had conducted the symposia, out of which 82 & 78 students responded to the feedback questionnaire respectively. The responses to each question are presented in Table 1.

We found that 77.4% of students who conducted the symposium agreed that their understanding was improved by the teaching technique, as compared to 67.46% of students who contributed to students' corners. 74.58% of students who presented symposia were satisfied with the technique, as compared to 63.91% who contributed to students' corners. 70% of students' corner contributors thought that the contents were clear and easy to understand, as compared to 64.97% of symposia participants who agreed the same. 69.41% of students agreed that students' corner topics were relevant, as compared to 49.15% agreement for the same in the symposium group. However, 54.44% of students who contributed to students' corners found the topics monotonous but 67.06% of them found the allocation of topics proper. 63.84% from the symposia group and 56.47% from the students' corner group agreed that discussions were held before or after the activity. 57% of students in both the students' corner group and the symposia group agreed that the time allocated for the discussions was adequate. 75% of students in the symposia group agreed that these discussions helped in understanding the subject better, as compared to 64% in the students' corner group. 55% of students in both groups agreed that there was appropriate

interaction with the teachers. 66.86% of the symposia group and 62.28% of the students' corner contributors agreed that they were given an opportunity to get their doubts cleared. 80% of the symposia group students agreed that teachers provided explanations that helped increase their clarity, as compared to 68.26% in the students' corner group who agreed on the same. 62.87% of the Students' corner contributors and 54.91% from the symposia group expected to score better in topics covered by the activity. Students agreed that these activities covered clinical applications (70.45% in the symposia group vs. 63.25% in the students' corner group) and that the knowledge they acquired will help them in clinical practice (73.14% in the symposia group vs. 59.28% in students' corner group). Students also agreed that the technique encouraged their intellectual curiosity (70.86% in the symposia group vs. 68.86% in the students'

corner group) and that the explanations were clear enough to understand the topics covered (65.25% in the students' corner group vs. 58.52% in symposia group). The students also agreed that the facilitators and the student speakers or contributors collaborated well (74.43% in the symposia group vs. 70.66% in the students' corner group) while the facility provided was used effectively (75.57% in the symposia group vs. 68.26% in students' corner group). The students also agreed that enough attention was given to individual students (58.54% in the students' corner group vs. 54.55% in symposia group) and that the particular pattern of teaching should be continued in the future (65.03% in students' corner group vs. 61.93% in symposia group). However, some students also agreed that the activity was unnecessary, and lectures or tutorials were enough (45.14% in the symposia group vs. 44.72% in the students' corner group).

**Table 1: Comparison of feedback regarding Students' Corner and Symposium**

Questions	Students' Corner (n=82) (%)			Symposium (n=78) (%)		
	Disagree	Neutral	Agree	Disagree	Neutral	Agree
1. Good understanding is achieved by this teaching technique.	10.65	21.89	67.46	9.04	13.56	<b>77.40</b>
2. As a student I was satisfied with this teaching technique.	10.06	26.04	63.91	7.34	18.08	<b>74.58</b>
3. The contents were clear and easy to understand.	7.65	22.35	70.00	10.73	24.29	64.97
4. The topics allocated were relevant to this teaching technique.	7.65	22.94	<b>69.41</b>	21.47	29.38	49.15
5. The activity was monotonous.	18.93	26.63	<b>54.44</b>	23.73	33.33	42.94
6. Allocation of topics was proper.	7.06	25.88	<b>67.06</b>	22.60	23.73	53.67
7. Discussions were held before/ after the activity.	20.00	23.53	56.47	14.12	22.03	63.84
8. The time allocated for discussion was adequate.	9.41	32.94	57.65	18.64	24.29	57.06
9. Discussions helped in understanding the subject better.	8.38	27.54	64.07	9.09	15.91	<b>75.00</b>
10. There was appropriate interaction with teachers.	15.57	28.74	55.69	19.89	24.43	55.68
11. Students were given an opportunity to clear their doubts.	10.78	26.95	62.28	14.86	18.29	66.86
12. Teachers provided explanations which increased the clarity	7.78	23.95	68.26	5.14	14.86	<b>80.00</b>
13. I expect to score better on topics covered in this activity.	7.19	29.94	62.87	18.50	26.59	54.91
14. The clinical applications of the topic were covered.	5.42	31.33	63.25	7.95	21.59	70.45
15. The knowledge acquired via this activity will help me in clinical practice.	8.38	32.34	59.28	6.86	20.00	<b>73.14</b>
16. This teaching technique encouraged my intellectual curiosity.	7.78	23.35	68.86	4.00	25.14	70.86
17. The explanations given were very clear to understand the topic.	4.79	29.34	65.87	11.36	30.11	58.52
18. For this teaching technique, the facilitators & student speakers made collaborative efforts.	4.19	25.15	70.66	4.55	21.02	74.43
19. The facility provided was effectively utilized.	4.19	27.54	68.26	5.68	18.75	75.57
20. References were provided whenever necessary.	14.02	29.27	56.71	13.07	23.86	63.07
21. Enough attention was given to the individual students involved.	10.37	31.10	58.54	15.91	29.55	54.55
22. This pattern of teaching should be continued in the future.	7.98	26.99	65.03	10.80	27.27	61.93
23. This activity is unnecessary. Routine lectures and tutorials are sufficient.	21.12	34.16	44.72	34.86	20.00	45.14

\* If the difference between the two techniques in the column 'Agree' is more than 10 % then the higher figure is made bold & underlined to highlight

The students' opinions regarding positive and negative aspects of Students' Corner & Symposium have been summarized in Table 2 & Table 3 respectively.

**Table 2: Feedback and Comments of Students on Students' Corner (n=82)**

Positive points	No of responders	Negative points	No of responders
Understanding Concepts, Information with knowledge	15	Less space and awareness	2
Self-study and self-learning possible	5	Monotonous and repetitive	2
Encourages interest and thinking creativity	3	Long articles	1
Novel concept	3	Inadequate time	1
Attractive presentation	3	No discussion	1
Revision of Topic	2	Time-consuming	1
Interactive sessions	1	Wrong information provided	1
Different - not monotonous	1	Allotment improper	1
Teamwork	1	Paper instead of PowerPoint presentation	1
Efforts taken by Teachers	1		
Regularity	1		

**Table 3: Feedback and Comments of Students on Symposium (n=78)**

Positive points	No of responders	Negative points	No of responders
Interactive sessions (with students, teachers as well as experts)	43	Fast, unclear, or low volume speech, reading from notes incoherent, not all were good	21
Explained well and Improved understanding/knowledge	31	Monotonous and Long	14
Confidence in public speaking and communication	22	No interaction with a lack of doubt-solving time	8
Presentations were good, concise, and quality of matter	20	Clear explanation lacking	6
Teamwork	8	Irrelevant or unwanted pharmacological topics expanding clinically	6
Hard work in preparation	7	Poor PowerPoint Presentation	4
Interest generation	4	Insufficient time	4
Use of Technology	4	Speakers seemed fearful nervous	3
Student participation	3	Wrong information	2
Depth in topic	4	Dressing of the Speakers	1
		Opinions of Teachers lacking	1

## Discussion

A German professor named Jean-Pol Martin proposed a model to allow students to prepare lessons and teach their peers.[11] It is a well-known fact that preparing to teach someone else helps the students to actually process the concepts in one's own thoughts.[12] Students' Corner and symposia are two such opportunities for students wherein they are given a chance to prepare and help their peers understand the topics.

In the present study, we divided a batch of 180 undergraduate second-year MBBS students into groups of two (90 students each) at the beginning of their academic year. Students of one group were given a task to submit an article in the students' corner activity, while the other group was told to give a presentation in the form of symposia on pharmacology topics. The perception of students regarding these novel teaching methods was assessed.

According to the undergraduate students, the Students' Corner helped in understanding concepts and gain knowledge. It also gave a chance for self-

study as well as self-learning. Other positive points regarding the students' corner in the opinion of students included encouragement of interest and creativity, novel nature, the attractiveness of presentation, and the possibility of revising topics amongst others. The negative points highlighted by the students regarding students' corners were the presence of less space or awareness, the monotonous nature of contributions, repetitive and long articles, wrong information provided, lack of time, and improper allotment amongst others.

The majority of the students who had conducted the symposium found the interactive nature of the sessions as the best quality. The nature of the explanation dispensed by symposia as well as presentations were the other positive qualities highlighted by the students. Public speaking opportunities as well as teamwork were other positive points highlighted. The negative points which were highlighted by the students were mainly the lack of clear speech by presenters and the long or monotonous nature of sessions. Lack of interaction, poor explanation, covering of irrelevant topics, and poor PowerPoint presentations were

other negative points about the symposia, in the opinion of the students.

We compared our results with similar studies and found similar findings. In a study by Sarkate et al., a student-conducted symposium as a teaching-learning tool was evaluated in the subject of Pharmacology. They found that students gave positive feedback on these sessions, and the majority opined that it should be continued in the future.[8] A study by Fiorella et al. also asked the students and study a topic and some of them were asked to teach the same to their peers. This study found that the comprehension of the topic was better in students who taught it to their peers.[13]

When students study with the intention of teaching, they put more effort into learning and have more interest in the same. Techniques like symposia in addition help the students gain confidence and overcome stage fear as well. Students' Corner is a great tool for introverted students to express their thoughts to their peers via the display board. These tools also help in providing the students various opportunities to interact well with the teachers, as well as collaborate and learn the art of teamwork.[14]

The incorporation of these novel teaching tools in the Indian Medical curriculum is not an easy task. Students and teachers may not be universally ready to go away from the traditional didactic lectures. Therefore, serious thought must be given to incorporate such novel teaching tools so that the students are given new opportunities to learn, to gain confidence as well as to collaborate and learn the art of teamwork.

The study had a few limitations. We did not compare these tools with the normally available tools of lectures and tutorials. As this was a single-center study, pharmacology & other subject departments in other medical colleges may be included in the future to assess the effectiveness of such novel techniques.

### Conclusion

Teaching by learning seems to be a promising new mantra for students, and students' corners or symposia are two such tools that adopt this new-age teaching module. Students in our study found the novel teaching tools acceptable and effective. Medical schools in India should try to inculcate these new teaching techniques for the betterment of the students but they should be used as a supplement to the traditional methods.

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