

# Technological Advancements Of Online Teaching Methods In The Subject Of Pathology In Second Year Medical Students: A Study At A Tertiary Care Teaching Hospital.

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## Abstract:

**Background:** Online interactive lectures are a newer concept in the competency based medical education developed by the NMC. It takes a lot of effort by the teachers in developing & executing these lectures. The use of technologically enhanced educational activities has not been fully studied. Thus, studies are essential to evaluate the appropriate educational tool to achieve high demands on better and interactive educational activities. Online lectures are more beneficial when used in conjunction with various interactive strategies.

**Materials & Methodology:** 250 MBBS students of second year batch were included. Informed verbal consent was taken. **Topic 1** was taught as Online interactive to group A students (77 Students) on Zoom platform using OBS interface software with audio mixture while online recorded lecture was shared to group B (77 students) on college You tube channel for MBBS students. In the **Topic 2** cross over was done.

**Results:** Data was collected through Google forms for Post-test MCQs scores & mean, SD, Z score & p-value was calculated using SPSS software. Post test score increased by a mean of 3.93 in interactive lecture group with significant p value (<0.05). Feedback Questionnaire on perception of Students & faculties on interactive teaching was collected by validated Google form.

**Conclusion:** Online Interactivity greatly improved the learning & performance of the second year MBBS students in the subject of Pathology. Technical advancement in teaching methods helped both teachers & students a lot. Most students & faculties considered interactive teaching as better.

**Keywords:** Online lectures, Interactive teaching, Recorded lecture, Second year MBBS students, Feedback Questionnaire.

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## I. Introduction

Faculty roles & skills for online learning are different compared to traditional teaching learning. Faculty needs to be updated in educational delivery by incorporating digital technology for which they not only have to be skilled for the subject specialty but also be well versed with technology usage and implementation.<sup>(1)</sup>

With the emergence of online lectures understanding the application of best practice in online lecture design is of significant and immediate relevance.<sup>(2)</sup> The basic concept of online learning is more than 170 years old. Actual online learning began as intranet in 1960, where linked computer terminals were used to provide academic material to students.<sup>(3)</sup>

With the advent of internet in 1994; digital literacy spread its wings in academics paving way for formal, accredited online courses and modules for personalized learning experiences.<sup>(4)</sup> Online learning has advantages of transcending time and geographical boundaries. It also encourages teamwork and cooperation among students.<sup>(5)</sup>

Using video conferencing tools one can connect and communicate with students across the globe to deliver lessons. Incorporating an online whiteboard, one can make the classes even more engaging.<sup>(6)</sup> Instructors who teach in this space are also very much aware of the need for establishing a teaching presence that facilitates and directs the learning process in ways that engage students in active and authentic, measurable and customized learning experiences.<sup>(7)</sup>

Successful application, experiences and rising educational needs based on learning theories provide practical and insightful guidance. <sup>(8)</sup> Thus, studies are essential to evaluate the appropriate educational tool to achieve high demands on better and interactive educational activities.

## II. Materials & Methodology:

- **Study Design:** Longitudinal educational interventional study.
- **Sample size and target population:** 250 medical Students of second year M.B.B.S.
- **Inclusion criteria:** Second year medical students who were willing (154 students)
- **Exclusion Criteria:** Pilot study students (50) & others who were not willing due to lack of internet facilities in the remote areas & poor connectivity( 46 students)
- Total of 154 students participated in this study.
- **Informed verbal consent** was taken from all the students.
- Random group formation A & B was done of 77 students each.
- Each major group A & B was further divided into 3 groups of 26 students each for 1<sup>st</sup> two batches & 3<sup>rd</sup> batch had 25 students for interactive teaching.
- Recorded lectures were shared the link on college you tube channel.

### Pre-session preparation

4-5 selected faculties & all the students were sensitized about online interactive teaching.

- Two topics were selected from the same level of competency. ( TOPIC 1 Peptic ulcer & TOPIC 2 Stomach cancer →both having Cognitive Domain & level- Knows, Knows How )
- All the post-test MCQ Google form & validated feedback questionnaire for students & faculties were prepared beforehand.
- Content validity Ratio (CVR) of the questionnaire was calculated using **Lawshe's Content Validity Index**.

### Implementation

- **Topic 1** was taught as online interactive lecture to **Group A** on Zoom platform using **OBS interface with audio recording**. Interactivity such as Case based scenario, Question answer sessions as well as brainstorming were done during the session to enhance the attentiveness of the students & to make the topic more receptive. Online presence was ensured by the online attendance system (log register) on zoom platform.

**Group B**-Online Recorded lecture link was shared in college YOU TUBE channel (mpsgmmedicosedu)

### Cross over:

- **Topic 2** online Recorded lectures via YOUTUBE link to group A while online interactive to group B on ZOOM platform.
- Post-test comprising of MCQs was conducted at the end of both the TOPICS (1 & 2)
- Google forms for validated feedback questionnaire on students & teacher's perception of online interactive teaching was shared using 5 point likert scale & data was collected & processed.

### Statistical tests used:

Mean score, SD value, Z score, P- value (SPSS software version 21.)

Feedback questionnaire was collected for students & faculties through online Google forms.

## III. Results:

This study was carried out in the department of Pathology in a tertiary care teaching hospital for a period of 6 months.

Data collected for Post-test MCQs was processed & mean & S.D as well as Z score & p-value was calculated.

**Table 1: Mean of post test scores of Recorded & interactive lectures  
TOPIC 1 & TOPIC 2 (n=77+77=154)**

S. No	Teaching learning methods	Post-test marks (25) Mean+- SD	Z score	p- value
1	Recorded lectures (Topic 1)	11.81+- 2.94	9.26	<0.05 ( significant)
2	Interactive lectures (Topic 1)	15.74+-2.30		
3	Recorded lectures (Topic 2)	11.44+- 3.58	13.68	<0.05 ( significant)
4	Interactive lectures (Topic 2)	15.41+- 3.16		

Above table shows that post test score increased by a mean of 3.93 in interactive lecture group with significant p value for topic 1 while for topic 2 post test score increased by a mean of 3.97 in interactive lecture group with significant p value.

**Table 2: Comparison of difference in proportion for High, medium & low scores in Recorded & interactive lectures in both group A & B (n=154)**

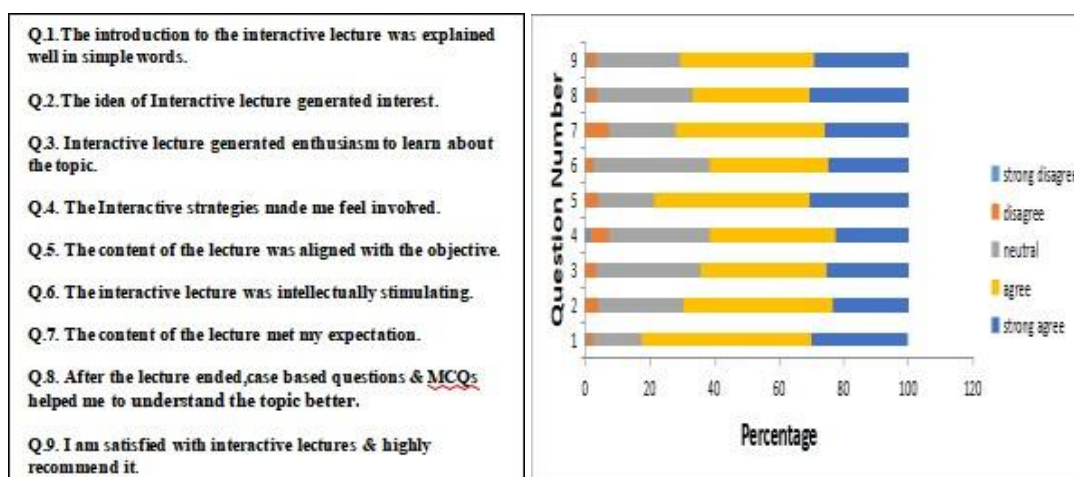
S.no	Marks (25)	Recorded lectures		Interactive lecture	
		No of students	%	No of students	%
1	< 8	9	5.85	Nil	0
2	8 to 16	134	87.01	110	71.43
3	>16	<b>11</b>	7.14	<b>44</b>	28.57
4	Total	154	100	154	100

Above table shows that there was 5.85% low scorers in the recorded lecture group but none of them in interactive lecture group. Further percentage of high scorers significantly increased from 7.14% to 28.57%. Student's & faculties perception on online interactive teaching was recorded through Google forms.

**Table 3: Showing Students perception on Interactive teaching (n=154)**

Question No	Strongly Disagree (1)	Disagree (2)	Neutral(3)	Agree(4)	Strongly agree(5)	Total (%)
1	0.6	1.9	14.9	52.7	29.9	100
2	0	3.9	26.6	46.1	23.4	100
3	0	3.2	32.5	39	25.3	100
4	1.3	5.8	31.2	39	22.7	100
5	0	3.9	17.5	48.1	30.5	100
6	0	2.6	35.7	37	24.7	100
7	0	7.1	20.8	46.1	26	100
8	0.6	2.6	29.9	36.4	30.5	100
9	0.6	2.6	26	41.6	29.2	100

Above table shows that in almost all the 9 questions percentage of students who agreed & strongly agreed were far more than those who disagreed.



**Table 4: For Qualitative analysis & suggestions by students ( n=154)**

S no	Remark/ suggestions	No of students	Percentage%
1	Online Interactive lecture was better	122	79.23
2	Online Recorded lecture was better	21	13.64
3	Offline is always better	04	2.58
4	No suggestions	07	4.55
	TOTAL	154	100%

Above table shows that 79.23 % (122) of students suggested that interactive lectures were better, While 13.64 % (21) felt that recorded lectures were better.

**Faculties perception on interactive teaching (n=5)**

Most of the faculties agreed & strongly agreed to the questions about interactive teaching on feedback form.

Regarding suggestions all the faculties were of the opinion that Interactive teaching using OBS interface has a good prospective in undergraduate teaching.

**IV. Discussion**

With the introduction of competency based medical education (CBME), new teaching methods have been introduced to ensure the attainment of competencies by medical graduates.

**Anjana Verma, et al** <sup>(9)</sup> studied “Interactive teaching in medical education”. She concluded “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.

Methods used in the study are think-pair-share, buzz sessions, case-based learning, and pass the prob  
**Cheema and Arora** <sup>(10)</sup> studied 150 medical students in Jalandhar to evaluate the “Effectiveness of interactive lectures as teaching method “demonstrated that interactive methods stimulate self-directed learning among students with improvement in academic performance.

**Panda et al.** <sup>(11)</sup> compared three types of interactive teaching methods: Flipped class room; MCQ based interactive teaching and Confusion technique. Their study revealed that students preferred FC technique of teaching followed by MCQ technique and confusion technique.

**Angadi et al.** <sup>(12)</sup> did an interventional study with 98 students, divided into two batches of Flipped class and conventional small group teaching showed that there was a significant difference between the post-test scores of each session.

**Kumar et al** <sup>(13)</sup> conducted a cross-sectional study among VIIth semester medical students to study the effectiveness of tutorials as an interactive method of teaching undergraduate students. Most of students (63.4%) revealed that they understood the topic better in tutorial session.

**Majda Sebbani et al** <sup>(14)</sup> Conducted a study on “Implementation of Online Teaching in Medical Education: it appeared that students were generally satisfied (52.3% satisfied and 20.7% very satisfied).

**Table 5: Comparison of Traditional versus interactive lectures amongst various authors.**

S.No	Author	No of Students participated	Traditional method Post- test (mean score + S.D)	Interactive teaching Post-test ( mean score + S.D)	Z score	p value
1	Cheema and Arora <sup>(10)</sup>	150	11.09 +- 1.416	13.59+- 1.388	----	<0.001
2	Panda et al. <sup>(11)</sup>	50	-----	----	9.055	<0.01
3	Angadi et al. <sup>(12)</sup>	98	9.61 ± 3.90	15.53 ± 3.76	-----	< 0.0001
4	Majda Sebbani et al <sup>(14)</sup>	111	-----	----	-----	<0.0001
5	Present Study (2022)	154	11.81+- 2.94	15.74+-2.30	Topic 1: 9.26 Topic 2: 13.68	<0.05

Above table shows in other authors study also mean score & SD have improved in interactive teaching with significant p value.

**V. Conclusion**

Innovation in medical teaching in the new Competency Based Medical Education is highly beneficial to both the teachers & the students & recommended as much as possible.

Student’s perception on interactivity was good, 79.23% of students suggested that interactive lectures were better with improvement in their post test scores by a good margin.

It also helped in inculcating lifelong learning skills in MBBS students such as Self-motivation, Attentiveness, Communication skills, Self-monitoring & Sharing knowledge with their peers which is very much needed in today’s hospital scenario.

In Faculties point of view also Interactive teaching greatly helps in better outcome in students with many students sending appreciation remarks for their interactive sessions.

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