



## ACCEPTABILITY AND EFFECTIVENESS OF FLIPPED CLASSROOM TEACHING AMONG PHASE II MBBS STUDENTS.

### Pathology

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### ABSTRACT

**Introduction:** The use of learning technologies, especially multimedia provides good learning facilities for students which are not possible with other media. Flipped classroom is an approach by which activities take place outside the classroom in contrast to the traditional teaching method. It also aims to increase interaction and personalized contact time between students and instructors in the classroom. Electronic learning environments and online courses are used very commonly these days by educational institutions. Blended learning is learning approaches that combine several learning tools such as electronic and web-based courses. The flipped classroom is a learning design that plays an important role in blended learning. **Methodology:** The sample size was 122 MBBS students of Phase 2. Institutional Research Board approval was taken and the study was conducted in the Pathology department of N.C. Medical College and Hospital, Israna. Students and faculty were sensitized. Two competencies were selected from the curriculum and sessions were conducted. Student and faculty questionnaires were distributed and responses were collected back. Analysis was done. **Results & Observations:** The Flipped classroom method was welcomed by most students and the faculty observers. 59% of students strongly agreed and found the flipped classroom learning process enjoyable. 53% of students strongly agreed that Flipped Class Room helped in interactive discussions. 56% of students strongly agreed that Flipped Class Room made the topic interesting. **Conclusion:** The flipped classroom model in pathology is an effective way to engage students and promote active learning in Pathology.

### KEYWORDS

#### INTRODUCTION:

Competency-Based Medical Education (CBME) is an approach to medical education that focuses on the outcomes and abilities that learners should possess rather than the time spent in training. Flipped classroom teaching can align well with new CBME principles by emphasizing active learning, self-directed study, and competency development. By aligning the flipped classroom model with CBME guidelines, you create a learner-centric environment that emphasizes the development of competencies essential for medical practice.

This approach encourages students to take an active role in their education and ensures that they are well-prepared for the complexities of the medical profession. Since the teaching material is shared before the class the students can take their own time to learn. The students become active participants and become more attentive.

The flipped classroom method is a hybrid approach, combining online learning and face-to-face classroom activities. The time in the classroom becomes very interactive. In this students are given time to engage with the teaching material. The students can take their own time to learn which is not possible in traditional teaching methods. In this method, each one can learn at their own pace with the learning material before the class. The class time is utilized for activity and better learning techniques. The classroom time becomes interactive sessions. In this method, the students become the center of learning rather than the teacher.

Hamdan<sup>1</sup> *et al* (2013) demonstrated that the use of a flipped learning model would help in creating a learner-centered classroom environment. They also stated that learning instructions can be delivered by recording and narrating screencasts on computers, creating videos of teachers while teaching, or gathering video lessons from trusted internet sites.

Gilboy, Heinrichs & Pazzaglia<sup>2</sup> 2015 also implemented the flipped classroom model on students of undergraduate courses. They explained student perception of the flipped classroom model. In their study, it was seen that the majority of the 142 students found the flipped method more effective than the traditional classroom model. It also provided the faculty with a design that can be implemented before, during, and after class.

Nouri, J<sup>3</sup>. In 2015 the study indicated that the flipped classroom model is seen to offer promising ways to engage students in more effective,

supportive, motivating, and active learning, especially for low achievers and students who may struggle with traditional lectures.

The aim of this study was to introduce a new way of teaching learning method into Pathology teaching of Phase II undergraduate MBBS students and to get students interested in the subject and to teach better clinical correlation of topics taken.

#### METHODOLOGY

The study was prospective in nature and was conducted on Phase II MBBS students at NCMCH, Israna. The sample size includes a Phase II MBBS batch of 122 students. Approval from the Institutional Ethics Committee was taken. The faculty was sensitized regarding this teaching-learning method. The students were made aware of this and the materials were sent to the students by various teaching aids one week before the sessions.

Two topics were covered over two sessions. The topics selected were PA 25.3(Pathology of Hepatitis) and PA 25.4(Alcohol Liver Disease including Cirrhosis of the Liver). On the day of the session, case cards were presented to the students based on the material shared. Discussions were done.

Students used the information they received to discuss the diagnosis. Two faculty members from the department observed the class. Each session had one faculty observer from Pathology and one faculty observer from another department.

After each session, an online test was given to evaluate the understanding of the topics.

In the last class, feedback was collected with the help of a questionnaire from the 98 students and the faculty observers who attended the session. The questionnaire was prepared with questions based on the Likert scale. Students were asked to write Reflections on their experience with the Flipped classroom method after the second session.

#### Statistical Analysis:

All the data were entered in Microsoft Excel and presented in count (percentage).

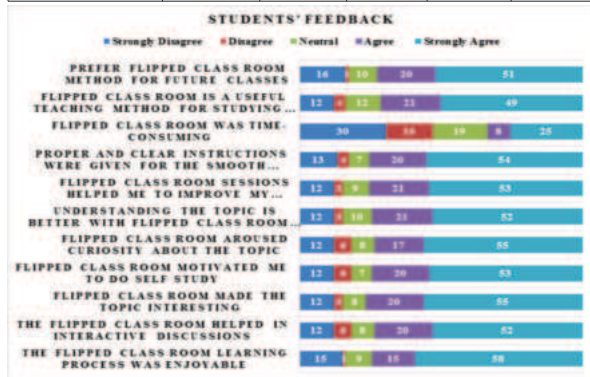
#### OBSERVATIONS AND RESULTS

Out of the total 122 students, 98 were present at the last session and

following responses were recorded from them.

**Table 1: Students' Feedback**

Question	STRONG LY DISAGR EE (1)	DISAGR EE (2)	NEUTR AL (3)	AGREE (4)	STRON GLY AGREE (5)
The Flipped Class Room learning process was enjoyable	15(15%)	1(1%)	9(9%)	15(15%)	58(59%)
The Flipped Class Room helped in interactive discussions	12(12%)	6(6%)	8(8%)	20(20%)	52(53%)
Flipped Class Room made the topic interesting	12(12%)	3(3%)	8(8%)	20(20%)	55(56%)
Flipped Class Room motivated me to do self-study	12(12%)	6(6%)	7(7%)	20(20%)	53(54%)
Flipped Class Room aroused curiosity about the topic	12(12%)	6(6%)	8(8%)	17(17%)	55(56%)
Understanding the topic is better with Flipped Class Room compared to regular lectures	12(12%)	3(3%)	10(10%)	21(21%)	52(53%)
Flipped Class Room sessions helped me to improve my learning skills	12(12%)	3(3%)	9(9%)	21(21%)	53(54%)
Proper and clear instructions were given for the smooth conduction of the Flipped Class Room topics	13(13%)	4(4%)	7(7%)	20(20%)	54(55%)
Flipped Class Room was time-consuming	30(31%)	16(16%)	19(19%)	8(8%)	25(26%)
Flipped Class Room is a useful teaching method for studying Pathology	12(12%)	4(4%)	12(12%)	21(21%)	49(50%)
Prefer Flipped Class Room method for future classes	16(16%)	1(1%)	10(10%)	20(20%)	51(52%)



**Graph 1: Students' Feedback**

As shown in the table and graph we found that 59% of students strongly agreed and found the flipped classroom learning process enjoyable. 15% of them found that it was not enjoyable, 53% of students strongly agree that Flipped Class Room helped in interactive discussions and 12% strongly disagree with this. 56% of students strongly agree that Flipped Class Room made the topic interesting 12% strongly disagree with this.

Some students (54%) also strongly agree with the fact that flipping motivated them to do self-study and very few (12%) strongly disagree with this fact.

56% of students said that the Flipped Class Room method aroused curiosity about the topic and out of them 53% found that understanding the topic is better with Flipped Class Room compared to regular lectures. 54% of the students found these sessions effective in improving learning skills.

It was seen that 55% of students strongly agreed that they were given proper and clear instructions for the smooth conduction of the Flipped classroom topics and 13% of them strongly disagreed with this. 26% of students found this method time-consuming and 52% have shown their preference for flipped classroom-directed learning in the future.

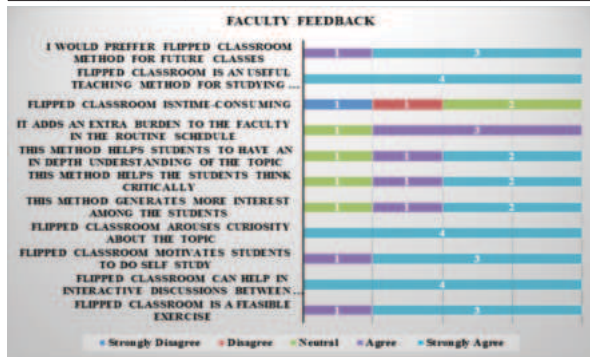
**Table 2: Reflection Question: Explain in your own words your perceptions and feedback about the Flipped Class Room Method of the topics covered- Hepatitis, Alcoholic Liver Disease-**

Favourable comments	<ol style="list-style-type: none"> <li>1. Very enjoyable and interactive</li> <li>2. Better communication between students and teachers.</li> <li>3. Great efforts made by teachers and each student.</li> <li>4. Better regular classes</li> <li>5. Flipped class made the understanding of the topic better.</li> <li>6. We are active during the session.</li> <li>7. The study material that is provided before the lecture will help in revision of the topic.</li> </ol>
Unfavourable comments	<ol style="list-style-type: none"> <li>1. Time consuming.</li> <li>2. The topic gets lengthened.</li> <li>3. Other subjects are disregarded.</li> </ol>

**Table 3: Faculty Feedback**

Q. No.	Question	Strongly Disagree (SD) (1)	Disagree (D) (2)	Neutral (N) (3)	Agree (A) (4)	Strongly Agree (SA) (5)
1	Flipped Class Room is a feasible exercise	0	0	0	1(25%)	3(75%)
2	Flipped Class Room can help in interactive discussions between students and faculty	0	0	0	0	4(100%)
3	Flipped Class Room motivates students to do self-study	0	0	0	1(25%)	3(75%)
4	Flipped Class Room arouses curiosity about the topic	0	0	0	0	4(100%)
5	This method generates more interest among the students	0	0	1(25%)	1(25%)	2(50%)
6	This method helps the students think critically	0	0	1(25%)	1(25%)	2(50%)

7	This method helps students have an in-depth understanding of the topic	0	0	1(25%)	1(25%)	2(50%)
8	It adds an extra burden to the faculty in the routine schedule	0	0	1(25%)	3(75%)	0
9	Flipped Class Room is time-consuming	1(25%)	1(25%)	2(50%)	0	0
10	Flipped Classroom is a useful teaching method for studying Pathology	0	0	0	0	4(100%)
11	I would Prefer Flipped Class Room method for future classes	0	0	0	1(25%)	3(75%)



Graph 2: Faculty Feedback

Faculty members also like students gave a positive response towards the flipped classroom method. 75% of the faculty members strongly agree that the flipped classroom is a feasible exercise. 100% strongly agree and found that flipped classrooms can help in interactive discussions between students and faculty. 75% of faculty members found that students found the classroom technique as motivational to do self-study. A 100% response was seen by faculty members among students about curiosity for the new topic. 50

50% of faculty members strongly agree that the flipped method generates more interest among the students in the topic and helps the students to think critically about the topic. 50% of faculty members strongly agree that the flipped method helps students have an in-depth understanding of the topic. 75% of them agree that adds an extra burden to the faculty in the routine schedule but none of them agree that it was a time-consuming method. 75% of the faculty agree that they would prefer the flipped technique in the future.

Table 4: Suggestions of Faculty about the Flipped Class Room-

1. According to every faculty member, the FCR method promoted more interaction and communication between students and teachers
2. Faculty suggested for more sensitization of faculty members of other departments.
3. Faculty also felt that Flipped Classroom Teaching promoted self-directed learning in students.
4. Implementing such sessions is challenging due to factors such as limited time for preparation, a large number of students, a shortage of faculty, and syllabus constraints.

**DISCUSSION**

The purpose of our study was to sensitize the students & faculty to experience an innovative method of teaching-learning that will help

them to understand the topic better. So that the Flipped Classroom method will be introduced in Pathology teaching and the students can get a better clinical correlation of the subject taught. It was anticipated that these exercises would encourage participants to actively learn, which would improve performance and lead to greater accomplishments.

By encouraging active learning, flipped classes allow teachers to involve their students and support their critical thinking, which leads to a deeper understanding of the material. <sup>4</sup> Overall, students as well as faculty showed a positive attitude towards the Flipped class room method of teaching learning.

In this case, the feedback received following the flipped teaching session is consistent with findings from other studies.<sup>5,6</sup> Notable remarks include how it improved their comprehension, allowed them to actively engage with the material and learn it, and gave them plenty of time and opportunity to ask questions of the facilitator and get their questions answered. Having learned most of the important material ahead of time, this was made possible. Students acknowledged that the instructor consistently encouraged active participation from them and that preparation for the class was essential to making the most use of the allotted time.

Total 98 students & 4 faculty members submitted their responses through the feedback form.

In the present study, 52% students said the Flipped class room helped them in interactive discussions and 55% said that this method made the topic interesting. 52% of them said that understanding of the topic is better compared to the regular lectures.

100% of the faculty thought that the Flipped class room helps in interactive discussions between students and faculty and 75% said this method motivates students to do self-study. 50% of faculty were of the opinion that this helps the students think critically. 75% of them said that they would prefer Flipped Class Room method for future classes.

In contrast to traditional teaching, all of the faculty members involved in this study agreed that active learning occurs when students participate actively in class activities. In order to empower students to reimagine their classrooms and develop higher-order cognitive skills and meaningful learning experiences that will ultimately improve the delivery of healthcare, it is both feasible and necessary to flip the traditional classroom. Research suggests that involving students in active learning improves their motivation and attitudes while also enhancing their learning outcomes, including higher-order thinking, problem-solving, and critical analysis.<sup>7,8</sup>

It is crucial to emphasize that there are other educational options besides the flipped classroom. Seeing patients is still the most important aspect of medicine, and nothing can replace it. Medical practice requires too much human interaction and clinical experience. However, the flipped classroom is a promising modality in medical education because it forces students to acquire fundamental medical knowledge and develop skills and abilities beyond the ability to recall information.

**Limitations**

This study had a time constraint so to evaluate it properly and effectively more sessions of this teaching-learning method need to be conducted across various subjects. Only two sessions were done. This was not enough to get proper statistically significant data. Also, it was conducted in a single Centre.

**CONCLUSION**

The Flipped Class Room method was well accepted by the students and faculty as a good teaching-learning method for Pathology. The implementation of the flipped classroom teaching methodology in the field of pathology demonstrated significant advantages in enhancing student interest in the topic, critical thinking skills, and overall learning outcomes. The pre-recorded lectures and interactive online materials have empowered students to take control of their learning and allowed them to read and learn at their own pace. This method inculcated self-directed learning which will finally lead to the Indian Medical Graduate becoming a lifelong learner.

**Implications**

The success of a flipped classroom depends on effective communication, preparation, and a commitment to creating an engaging and collaborative learning environment. Adjustments may be necessary based on student feedback and evolving educational needs. With this innovative method, the students learn better clinical correlation of the topic taught in Pathology.

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