

Original Research Article

# A Comparative Study of Outcome of Flipped Class Room Assisted Lecture Classes and Traditional Lecture Classes among First MBBS Students in a Medical College of West Bengal

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## ABSTRACT

**Background:** The Medical Council of India has laid the basic framework for the revised undergraduate medical curriculum. Flipped class room teaching, self-directed learning and lecture classes combined may be more effective in implementing the new competency based medical education. Overtly the above facts may sound ideal for transforming the current curricula as envisaged by the MCI.

**Aims:** The present study was conducted in a Medical College of West Bengal to compare outcome of Flipped class room assisted classes and lecture classes among first MBBS students.

**Materials and methods:** The present study was conducted in the Department of Physiology in a Government Medical College of West Bengal, under West Bengal University of Health Sciences. Institutional ethical clearance was taken before conduction of the study. This pilot project was conducted in time span of 6 months. Ten lecture classes assisted by FC and ten traditional lecture classes were compared in the present study.

**Statistical analysis:** SPSS version 16 was used to analyze the data and T test was done to compare outcome of the two teaching methods. Results: One hundred fifty students were in the first MBBS batch. But one hundred twenty students came regularly to all these classes, so they were only included in the present study. Ten flipped class assisted lectures were compared with traditional classes and evaluated with MCQs. There was no significant difference in outcome of the two teaching learning methods. Marks of Flipped classroom assisted lecture  $53.63333 \pm 8.519238$  vs. Traditional lecture  $53.55 \pm 8.575238$ ; P value: 0.94036. According to the students they had no time to go through the extra study material provided to them as part of flipped classes. They were new to the MBBS course and with the huge syllabus of Anatomy, Physiology, Biochemistry they lacked time for flipped classes. They were more comfortable with the traditional lectures.

**Conclusions:** In the present study Flipped classroom assisted lectures and traditional lectures were equally effective for first MBBS students. Lack of interest of students in study materials provided to them for the flipped classroom study was the main cause of this outcome and according to the students' deficiency of time was the key factor for their particular behaviour.

**Keywords:** Flipped classroom, traditional lecture class, MBBS students.

## INTRODUCTION

Nearly over a decade, medical education has been on the lookout for transformation. The current healthcare environment requires competent physicians to coordinate with an inter professional team to deliver safer, quality, and more cost-effective patient care. These factors are responsible for the growing trend in medical education reforms. [1-4]

The Medical Council of India in 2019 has implemented learner-centered models as well as competency-based curriculum. Competency based Medical Education provides an effective outcome-based strategy where various domains of teaching including teaching learning methods and assessment form the framework of competencies. The Medical Council of India has laid the basic framework for the revised undergraduate medical curriculum. [5]

The flipped classroom (FC) represents an essential component in curricular reform. Technological advances enabling asynchronous and distributed learning are facilitating the movement to a competency-based paradigm in healthcare education. Flipping the classroom is a practice of assigning the students with didactic material before the class, which are traditionally covered in lectures. In the class face-to-face time for more engaging and active learning strategies is further used. As medical educators are able to successfully flip a lecture, they can gain new teaching perspectives, and this is very essential to effectively engage in curricular reform. [6-9]

A flipped classroom focuses instructors to think more critically about what to present and how to present. The following are the positive outcomes of a flipped class room. [6-9]

1. It is a more interactive classroom. Students may go through interactive cases together in small groups. They may come up with diagnoses based on the patient's chief complaints.
2. It helps the students to learn at their own pace, which is a very important

component of competency based medical education. Students can get time to read additional materials required, and may slow down or speed up at certain areas, as and when necessary.

3. Students can review study materials in a stepwise fashion. This may help to better recall of different aspects of knowledge later on.

During active learning students should to have ownership of their learning for meaningful outcome of learning experiences. The FC provides opportunity and time for face-to-face engagement. This aligns prior knowledge obtained with experiences and helps to prepare the learners for better practice. These experiences collectively help to build confidence of the learner and provide opportunities to support development of self-efficacy. It also creates an environment of inquiry and open questioning. Various teaching tactics and strategies are in practices that support this approach. Tactics require less coordination than the strategies. They can also be used by individual faculty to engage learners in an FC.

Effectively implementing the model of FC requires being cognizant of overall curricular goals; the underlying theories of education; the active learning strategies; development of new education technologies. Significant changes in management strategies are required to fully realize the potential of the FC. They include conducting rigorous medical education research in new teaching methods and also competency-based educational outcomes. [4-8]

Lectures are still a very necessary part of medical education. This is especially for content that requires more interaction – working through patient cases in a dynamic way. Here students can ask questions about the history; formulate a differential diagnosis in real time and further change it in according to the new information gained. Lecturers who put the effort into implementing the flipped classroom model simply can make better lectures. As a result,

students do not have to relearn the contents. [8-9]

The present study was conducted in a medical college of West Bengal to compare outcome of Flipped class room assisted lecture classes and traditional classes among first MBBS students in the Department of Physiology. The aim of the study is to promote the role of lifelong learner among undergraduate medical students.

## MATERIALS AND METHODS

The present study was conducted in the Department of Physiology in a Government Medical College of West Bengal, under West Bengal University of Health Sciences. Institutional ethical clearance was taken before conduction of the study. The project was conducted in time span of 6 months.

**Inclusion criteria:** All students enrolled in the first MBBS programme were included in the study.

Ten lecture classes assisted by FC and ten traditional lecture classes were compared in the present study. FC is the result of assigning didactic material to learners before class time while using face-to-face time for more active learning strategies such as reflection, group projects, or discussions. Core elements of an FC include assigned pre-class content, formative assessment, working on learning gaps, developing competency, and the teachers' role as guide on the side. Each offers multiple educational advantages.

The following strategies were considered prior to each class:

1. The learners' cognitive load including all their assessments and assignments.
2. Accurate estimation and communication of the amount of time expected of students to spend on didactic materials outside of class.
3. Providing an online schedule and making learning materials easy to find and easy to use.

4. Ensuring assessment methods are competency-based and match the goals.
5. Formative assessment and feedback to be used identify learning gaps and develop competency during "richly interactive, compelling, and engaging" sessions.

The students were informed about the classes ahead of time regarding the topics and the mode of teaching, learning and assessment.

**A. Lecture session supplemented with FC:** Each lecture class lasted for 45 mins and there were brain storming sessions in the class as the students were already be provided with all study material well ahead of time. The FC provides time for face-to-face engagement, which aligns prior knowledge with experiences and prepares learners for practice. These experiences collectively build learner confidence, provide opportunities to support development of self-efficacy, and create an environment of inquiry and open questioning, all these aspects were taken care of in the lecture sessions.

**Assessment of session:** The students were given a MCQ test immediately after the session. The test involved 10 MCQs (to be answered in 10 minutes) for a maximum of 10 marks covering the same content areas as the lecture session. The MCQ papers were collected and evaluated manually with no negative marking. The results were tabulated.

Traditional Lecture session: Each lecture class lasted for 45 mins.

**B. Assessment of session:** The students were given a MCQ test immediately after the session. The test involved 10 MCQs (to be answered in 10 minutes) for a maximum of 10 marks covering the same content areas as the lecture session. The MCQ papers was be collected and evaluated manually with

no negative marking. The results were tabulated.

**Statistical analysis:** SPSS version 16 was used to analyze the data and T test was done to compare the two teaching methods.

## RESULTS

One hundred fifty students were in the first MBBS batch. But one hundred twenty students came regularly to all these classes, so they were only included in the present study. Ten flipped class assisted lectures were compared with traditional classes and evaluated with MCQs. There was no significant difference in outcome of the two teaching learning methods. Marks of Flipped classroom assisted lecture  $53.63333 \pm 8.519238$  vs. Traditional lecture  $53.55 \pm 8.575238$ ; P value: 0.940362 (Table 1; Figure 1).

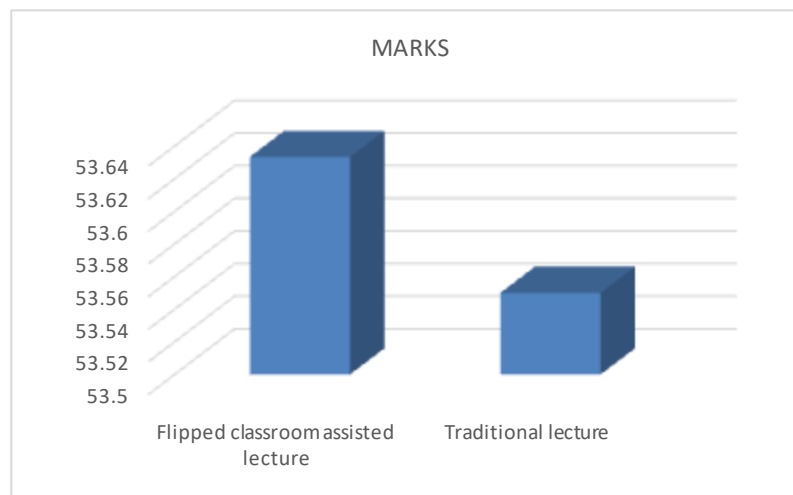
The Study materials were provided to students in form of video lecture, power point presentations and reading material. This was for the non-face to face sitting.

Most of the students (98%) did not pay attention to the study materials provided to them prior to their classes. So everything had to be taught in form of traditional lecture classes. The sessions could not be interactive and doubt clearing and brainstorming. So face to face time was not spent on activities such as case solving, group discussions, quizzes to consolidate learning. Pre- and post-class quizzes, work sheets and blog posts were used to ensure better learning for each session, but as the students did not follow the study materials provided to them all these methods were not at all fruitful.

According to the students they had no time for these extra study material provided to them. They were new to the MBBS course and with the huge syllabus of Anatomy, Physiology, Biochemistry they lacked time for flipped classes. They were more comfortable with the traditional lectures.

**Table 1: Comparison of the two teaching methods.**

CLASS	Flipped classroom assisted lecture N= 10	Traditional lecture N=10	P value
Marks	$53.63333 \pm 8.519238$	$53.55 \pm 8.575238$	0.940362



**Figure 1: Comparison of the two teaching methods.**

## DISCUSSION

Successful accomplishment of a new pedagogy or teaching technique or instructional tool requires three steps:

A. The first is the seed idea.

B. Second, the seed idea has to be converted into an implementable format or framework.

C. Third, the outcome which results from the execution of innovation should also be measured.

The first two steps usually raise the expectation level, and once the framework is put in the public forum and subsequently, the downward slope begins thereafter. As such, reactions to disruptive innovations can range from acceptance/ support in the positive end of spectrum to neutrality to rejection/resistance in the negative end of the spectrum. <sup>[10]</sup>

In the present study we did not observe any positive outcome of flipped classroom assisted lecture classes over traditional lecture classes. Our students were not willing to accept this innovative idea of flipped classroom assisted lecture classes. So they did not follow the home assignments given to them prior to the classes.

For curriculum reform flipped classroom represents an essential component. <sup>[7]</sup> Technological advances have enabled asynchronous and distributed learning. These are facilitating the movement to a competency-based paradigm in health education. Flipping the classroom is the basic practice of assigning students with didactic material, which are traditionally covered in lectures. These are to be learned before class. The class time is used for face-to-face time for more engaging and active learning strategies. The development of more complex learning and new innovative systems is creating new opportunities for learning across the continuum of medical education. As medical educators are engaged in the process of successfully flipping a lecture, they are able to gain new teaching perspectives. <sup>[7]</sup>

In a study Fatima SS et al <sup>[6]</sup> implemented the “flipped classroom” model. The study was conducted to enhance active learning among medical students with neurosciences module at Aga Khan University in Karachi. Ninety-eight undergraduate medical students were enrolled in the study. The Study materials were provided to students in form of video lecture and reading material. This was for the non-face to face sitting; while face to

face time was spent on activities such as case solving, group discussions, quizzes to consolidate learning. Pre- and post-class quizzes, work sheets and blog posts were used to ensure better learning for each session. Eighty-four percent students gave positive feedback towards utility of flipped classroom. Students also reported that their queries and misconceptions were cleared in a much better way in the face-to-face session following FC as compared to the traditional setting.

But we could not observe any positive effects of flipped classrooms in the present study.

To study the effect of peer assisted learning on academic performance and perceived stress scores among first MBBS students in a college of West Bengal we had conducted a study. <sup>[11]</sup> Eighty-four students participated in the study. We concluded that PAL may alleviate stress levels among new medical students and improve their academic performance especially in the initial academic years. <sup>[11]</sup> In the present study the students had to study on their own for flipped classes with the aid of study materials provided to them.

Coaching classes have become the unorganized sector of education. They attract students aspiring to join professional courses. The limited number of institutions of higher learning in this country makes the rat race an act of desperation. By the time they enter medical school, the students are tired and bored lot having undergone the extreme stress of coaching and competition. The undergraduate period provides some respite till they gear up for the next round of second-hand learning in the form of coaching classes for getting a postgraduate seat. Many take it easy during this period. <sup>[12]</sup> This may also be a cause of their behaviour regarding flipped classes.

To study the effects of telemedicine assisted teaching methods among post graduate residents in a rural medical college of West Bengal we had conducted a pilot project. <sup>[13]</sup> It was observed that telemedicine assisted teaching significantly



improved knowledge in fields of research work among postgraduate residents of the department of Physiology. Learner satisfaction was high in telemedicine assisted learning with an overall score of 4.84 on a 5-point Likert scale. But in the present study the learners were not satisfied with the flipped classes. In the present study first MBBS students were included, while in the previous study Post graduate residents were included. These young, new students are not well acquainted with the concept of self-directed learning, which may be a cause of non-cooperation on behalf of these students.

**Limitations and future scope:** This pilot project was conducted within the first six months of first MBBS course. The students were new to the medical curriculum and they were not acquainted with the concept of flipped classroom assisted lectures. So their response may have been so negative regarding flipped class room study. Only ten classes were compared in the present study. All these factors may be responsible for the outcome of the study. We are planning to conduct future studies on students of second and third MBBS to observe the effects of flipped classroom study in our institution.

## CONCLUSIONS

In the present study Flipped classroom assisted lectures and traditional lectures were equally effective for first MBBS students. Lack of interest of students in study materials provided to them for the flipped classroom study was the main cause of this outcome and according to the students' deficiency of time was the key factor for their particular behaviour.

**Conflict of interest:** Declared None.

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