

Exploring Blended Flipped Classroom for Syllabus Coverage

Azeem Unissa¹, Aishwarya Gopakumar², Vaishnavi Rao³

¹Assistant professor

²³rd year B.Tech, Electronics and Communication Engineering Department,

Hyderabad Institute of Technology and Management (HITAM), Gowdavelly (V), Medchal (M), Hyderabad -500048, India.

¹azeemunnisa.ece@hitam.org

²aishwarya31121997@gmail.com

³vaishnavirao27@gmail.com

Abstract: Enhancing the regular mode of teaching can bring about a change in the conventional pattern of teaching and learning, in accordance to this statement research was carried out to compare the effectiveness of flipped classroom (A classroom enhancement activity) in contrast to the conventional teaching methods Kuntineemaneratna, et al, [1] [2016] . Syllabus coverage in an effective manner is a challenge that a lecturer faces while delivering the subject within the classroom, especially when the subject is vast. This pedagogy of blended flipped classroom was implemented on students pursuing their second year of under graduation for the course EM TL (electromagnetic theory and transmission lines). The idea of this pedagogy was to cover the syllabus in an effective manner by making students solve more numerical problems within the classroom. The paper discussed here is a case study on how a classroom enhancement activity like flipped classroom had helped in the syllabus coverage. It was found that blended flipped classroom was successfully implemented, and syllabus coverage took place but, the end exam results were low. However, further research can be carried out to determine the link between syllabus coverage and the end exam result.

Keywords: Syllabus coverage, blended flipped classroom, end exam result, marks, classroom enhancement activity, low results.

1. Introduction

There is a general tendency for a student to experience boredom when there are no student engagement activities and it is quite difficult for the lecturer to make a vast subject effective without wastage of time while conducting activities. It is also seen that in conventional teaching practices students usually fail to solve more number of problems. Flipped classroom models generally eliminate this problem of the lecturer as students are made to solve numerical problems within the classroom and take away theoretical concepts as home work by which both the student and lecturer are benefitted. Ang Swee. Blended et.al [2], [2016], flipped classroom models are like flipped classroom models but are more flexible as the classroom can be converted to the regular conventional class whenever it is necessary. This flexibility of the blended flipped classroom model makes it easy for implementation as well.

2. Background

There have been several researches conducted on flipped classroom where there were discussions on how flipped classroom was helping students enhance their ICT skills (Ang sweewen, et al, 2016). ICT stands for information and communication technology which is a skill that the industry demands

Azeem Unissa

Assistant professor,

Electronics and Communication Engineering Department,
Hyderabad Institute of Technology and Management (HITAM),
Gowdavelly (V), Medchal (M), Hyderabad-500048, India.

azeemunnisa.ece@hitam.org

in this competitive world. There was another research done to compare the effectiveness of flipped classroom in comparison to the conventional teaching methods Kuntineemaneratna, et al,[1] 2016), where it was found that flipped classroom set a benchmark to active learning. Similar researches have been carried out to study how student engagement activities like flipped classroom can be implemented to enhance the classroom. Targeted flipped classroom technique applied to a challenging topic was another method that was implemented by applying different concepts irrespective of results Joseph ranalli& Jacob moore[3], [2016], in this method a topic from the syllabus was chosen based on the level of difficulty and flipped classroom was implemented only for a topic that was voted to be very difficult by the students themselves. A design and application of flipped classroom teaching model to improve practical operation and technical innovation ability of engineering students was another research carried out to enable students to become practically sound and improve their technical knowledge jiang jin-gang, et al, [4], [2016]. Lessons from a failed flipped classroom teaching model to improve the interactivity in a computer science class was a research presented Dave Towey, [5], [2015]. A detailed study on how evaluating flipped classroom with respect to threshold concepts learning in engineering to analyze how lecture material and video based learning benefit students was carried out ElanieKhoo, et al [6],[2015].

This paper delves into how blended flipped classroom played a role in syllabus coverage for a vast subject like EMTL.

3. Method

A. Participants

This study was conducted on students completing the course “Electromagnetic theory and transmission lines” of second year Electronics and Communication Engineering (ECE) at (institution name). Two classes

having EMTL in their curriculum with a total strength of N=110 were subjected to this mode of teaching. Total number of students that participated actively, (N=110, Males=44, females=66).

B. Instrumentation

Like any other pedagogy, blended flipped classroom method also utilises few resources. Here whatsapp, which is the most accessible source of communication these days, was providing an interface between the lecturer and the student as the topics for the next class were posted in groups on a daily basis by the lecturer. All the updates were regularly put up in the group for student's convenience. In addition to this lecture materials were

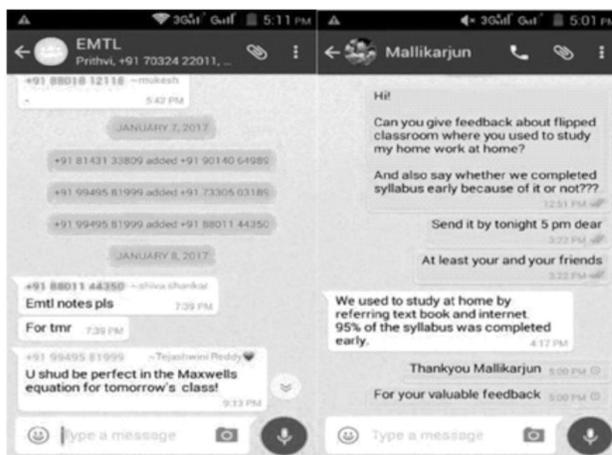


Fig. 1 Updates posted in the whatsapp groups



Fig. 1.1 lecture material

Table1: In-class details of study

NO OF STUDENTS	110
SUBJECT	EMTL
TEACHER IN CHARGE	Teacher name
CO-FACULTY	Co faculty name
YEAR OF STUDY	SECOND YEAR

also posted in the respective group for student's reference.

The co faculty played a vital role in analyzing the students' performance, evaluation sheets were regularly updated. Demonstration, using tools like charts and prototypes were brought into the classroom for better understanding. Before the faculty in charge could begin the topic for the day, one of the student would summarize the previous topic and give a reflection to the topic for the day

C. Procedure

Classroom activities were designed in such a way that students would be solving questions within the class and were taking away conceptual theory as homework on everyday basis, this improved the students interest and approach towards learning the subject, students were curious as they had to solve problems in the classroom and for this they needed to know concepts. Blended flipped classroom was designed for most of the topics in all the five units of EMTL course. As the world is evolving, technology plays a crucial role in communication, implementation of this method is done by using whatsapp, and students are updated with notes on regular basis. They were asked to summarize the topic before the lecturer in charge could start explaining the topic for the day. There was a questionnaire related to previous topic before the class began, as this will help the students to have a quick review of the previous lectures which will enable them revise their basics of the course (EMTL). Blended flipped classroom model is an extract from flipped classroom model with a

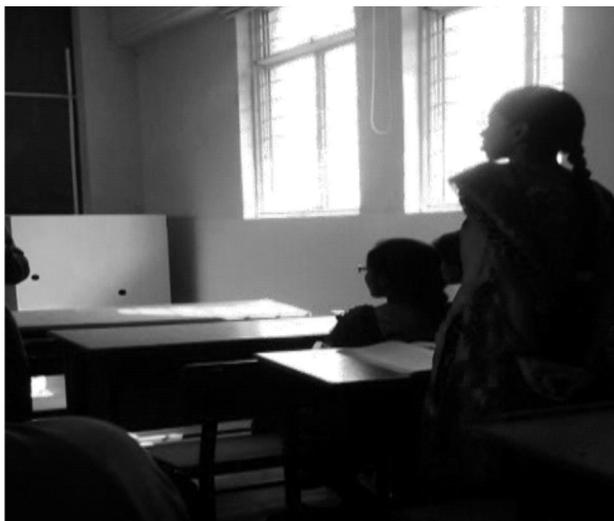


Fig. 3 Questionnaires' to the student

flexibility of being able to convert the classroom into any activity based or theory based class depending upon the requirement. This method was able involve students in day to day lectures by not making the classes boring.

4. Result

Blended flipped classroom pedagogy was successfully implemented and the agenda of syllabus coverage has been successfully obtained. This method was successful enough to bring students to a position where students themselves wanted to explore the topics for the day as there were questionnaires' and reflection sessions conducted on everyday basis. Student involvement in the subject was achieved and there was active learning. This method enabled students to solve more number of problems within the classroom and along with this the faculty in charge had self-learning as a boon to themselves. Though this method was satisfactory in terms of implementation, end exam results were quite low. The end exam result dropped down to 35% (2017) from 66%(2016).



Fig. 4 Students solving problems in the class

The implementation of flipped classroom was successful as 90% of the entire syllabus was completed. As the syllabus was successfully completed before time, students could solve more number of problems within the classroom. Despite of successful implementation the end exam results of the student was poor compared to the previous year. The statistical result is given below in the form of a bar graph.

Figure 5 is a graphical representation on how a student's end exam result has fallen in comparison to the previous years, despite success rate of the activity.

The percentage of success and failure is also determined by the figures of percentage mentioned earlier.

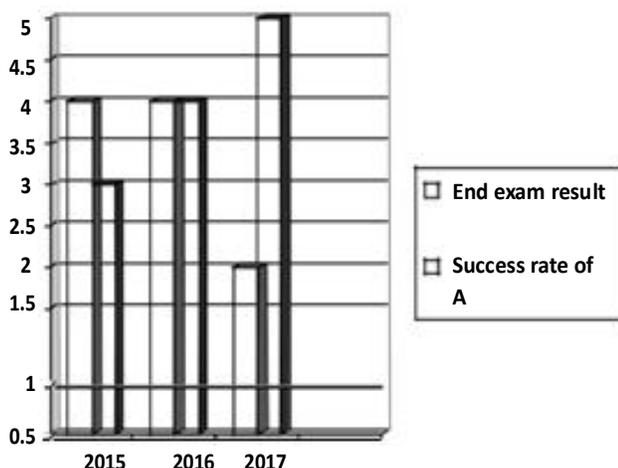


Fig. 5 Performance graph

5. Discussion

As it is a tedious task to any faculty for syllabus coverage of an immense course like EMTL (electromagnetic theory and transmission lines), in our study we implemented flipped classroom model with problem solving technique. The result of this pedagogy was successful but the end exam result was low. This shows that the students were engaging actively by solving numerical problems in class and learning the theoretical concept as homework. Flipped classroom model has helped to solve more number of problems by conducting classroom activities, this in order will develop students learning skills. As the notes are posted in WhatsApp students take the notes and they come prepared for the next class, this intervention is time saving. Difficult topics are targeted in the course EMTL (electromagnetic theory and transmission lines) by flipped classroom method for syllabus coverage which was successfully implemented and learning was made beneficial.

6. Limitation & Recommendations

From the method of blended flipped classroom, it was found that students tend to spend most of their time on a particular subject which can end up getting down their performance in other subjects. The system of education in India is unique and it is found that the implementation of blended flipped classroom on a

wider scale might be a tedious job, as teachers who have been following conventional teaching techniques may find it very difficult to adopt to this kind of teaching technique. It is also found that the research construction ability for flipped classroom is quite demanding and not every institution can opt it. Having updates on an online platform is again a drawback because, not everyone is accessible to the internet.

While implementing flipped classroom it was also found in some cases that student could not access data because they were not equipped with technology. Sometimes it occurred that student was unable to explain the concepts in the classroom because of the lack of clarity on the concept.

References

- [1] Kuntinee Maneeratana, Thanyarat Singhanart, and Pairod Singhatanadgid (2016). A preliminary study on the effectiveness of a flipped classroom in Thailand, 2016 IEEE international conference on teaching, assessment and learning for engineering (TALE).
- [2] Ang Swee Wen, Norasykin Mohd Zaid, Jamalludin Harun (2016), enhancing student's ICT problem solving skills using flipped classroom model, IEEE 8th international conference on teaching, assessment and learning for engineering (ICEED).
- [3] Joseph Ranalli, Jacob Moore (2016), targeted flipped classroom technique applied to a challenging topic, IEEE 2016.
- [4] Jiang Jin-gang, Zhang Yong-de, Du Hai-yan, Qiao Yu-jing, Wang Mo-nan, Dai Ye (2016), design and application of flipped classroom teaching model, the 11th international conference on computer science and education (ICCSE 2016), august 23-24 2016, Nagoya university, Japan.
- [5] Dave Towey (2015), lessons from a failed flipped classroom, IEEE international conference on teaching, assessment and learning for engineering (TALE).
- [6] Elaine Khoo, Jonathan Scott, Mira Peter & Howell Round (2015), evaluating flipped classroom with respect to threshold concepts learning in undergraduate engineering, IEEE – 2015.