



JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)

An International Scholarly Open Access, Peer-reviewed, Refereed Journal

“Flipping” the Classroom to Explore Active Learning in an Undergraduate Course

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Abstract: The flipped classroom is a student-centered approach to learning that increases active learning for the student. It is compared to traditional classroom-based instruction. In this method, students are first exposed to the learning material through the homiletic outside of the classroom. It is usually in the form of written material, online lectures, or useful videos. During the normal teaching time, a faculty provides all the material via a case study, allowing for complex problem solving, peer interaction, and a deep understanding of the concepts. A successful flipped classroom should have three goals: (1) allow the students to become perceptive, (2) always two-way communication between students and faculties, and (3) actuate the development of depth knowledge of the material. The flipped classroom model includes teaching and learning methods that can be implored to all generations in the academic environment.

IndexTerms - Flipped classroom, Active learning, classroom research, Presentation skill

I. INTRODUCTION

The Flipped Classroom is not a methodology, it is Ideology In flipped classrooms, also identified as inverted classrooms, students review lecture materials before class as homework. In-class time is dedicated to discussions, interactive exercises, and independent work that would have previously been completed at home — all under the guidance of the teacher, who is present and available to react to any questions that may arise. The materials reviewed before class can take the form of recorded lectures, created videos, reading assignments, video broadcasts, and any material that the instructor allows as relevant to the topic at hand. In other words, we can say, A flipped classroom is interactive learning, where learners are introduced to content at home and practice working through it at school. This is the reverse of the more common practice of introducing new content at school, then assigning homework and projects to complete by the students individually at home.

1.1 How to flip a classroom?

- Empower the student by creating or generating a student-centered learning environment.
- Move the role of teacher into guide and facilitator.
- Use different technology (LMS and other digital tools and technologies to create and share)
- Evaluate learning outcomes regularly and generate practice sessions and exercises to fulfill the learner’s needs and requirements.
- Create Learning Communities.

1.2 The Flipped Classroom is not just:

- Online Videos
- About replacing faculties with video
- An Online class students working without formation
- Surface gain method

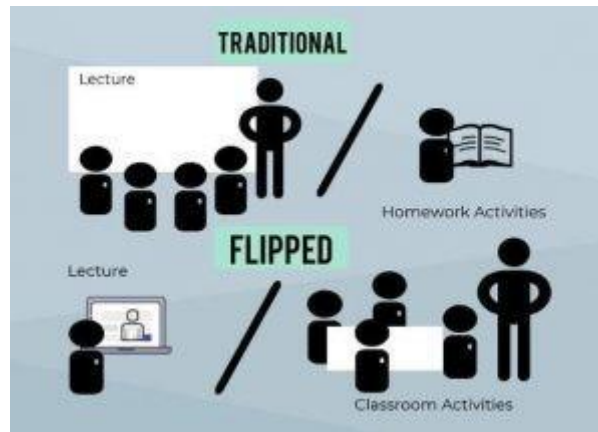


Fig.1 Traditional Vs Flipped[6]

The Flipped Classroom can be:

- Pre advanced tutorials and Programmers
- Interactive Web Sites
- Use online evolution applications (like Google Classroom)
- Useful animated study videos
- Primary source Image or Documents
- Simulations and Animations
- Slide Share(presentation by their classmate)

II. FEATURES (CHARACTERISTICS) OF THE SUCCESSFUL FLIPPED CLASSROOM:

There are many versions and viewpoints on characteristics of the Flipped Classroom approach:

Varied forms of learning:

Observational findings in Pedagogical Research have identified that the Flipped classroom approach comprises all forms of learning including all learning styles. It includes oral, visual, problem solving, critical thinking creativity, and innovation.

Application Based Approach:

To traditional teaching, Flipped Classroom is based on an application-based approach in the form of activity-based learning.

Accessibility:

Of resources or accessibility in Flipped Classroom is exceptionally convenient for everyone whether he is a teacher or learner.

Communication or Interaction:

In flipped classroom learning, there is a greater facility of communication and interaction between teacher and student as compared to traditional classrooms.

Student-Centered Teaching:

Flipped Classroom assists a learner-centered model. This model makes sure that the course through flipped class is mainly focused on learners' inclusive achievement and accomplishments within the learning context.

Depth Learning:

The class learning model believes in in-depth and extensive learning and discourages cramming or rote learning.

Self-Directed Learning:

In this flipped-classroom approach, self-directed learning will be encouraged. Learners will be more responsible and accountable for their learning. Because they have been provided sufficient resources, foundational information, and continuous measurement and feedback are provided by their teacher, it will provide them a good self-directed learner for more difficult courses.

2.1 Four Pillars of flipped class learning:

Four Pillars of Flipped Learning are as follows:

Flexible Environment:

In Flipped Classroom, a flexible environment is generated for an individual that allows the learner to learn the new concepts at their speed, pace, and interest. Teachers continuously observe and monitor students and make appropriate compromises. There are diverse opportunities and various styles or ways when a student can learn the content and demonstrate mastery. Teachers must expect that class time will be "slightly chaotic and noisy" and that timelines and expectations for learning estimations will have to be flexible as well.

Learning Culture:

The classroom becomes student-centered. According to the guide, Students move from being the product of teaching to the center of learning, where they are actively involved in knowledge formation through opportunities to engage in and evaluate their

learning in a personally meaningful manner. In Flipped Classroom, learning culture is intensive and in-depth about learning context. This is also called learner-centered culture where students are given opportunities to engage in meaningful activities. The teacher's role is not central. Teachers or mentors support students and make them manageable through differentiation and feedback.

Intentional Content:

Intentional content is a central point in Flipped Classroom Learning. The teacher decides and curates relevant content which is based on prioritizing those concepts used in direct instruction for learners to make content accessible and relevant to all students. Teachers In this approach, the teacher decides the content which is already planned and intentional in form of what material needs to teach and what students should explore on their own.

Professional Educator:

In Flipped classroom approach, the role of the professional educator is quite different from the traditional classroom approach. In flipped classrooms; the role of the educator is more important and challenging. Their jobs are constantly observed their students, assess them and provide them relevant feedback. They are having a reflective approach in their instruction. They accept constructive criticism and tolerate meticulous confusion in their classrooms. It is also seen that they appear as less visibly prominent roles but remain essential elements that enable flipped learning to occur.

III WHY ARE TEACHERS FLIPPING FOR THE FLIPPED CLASSROOM?

Twenty-first-century Pedagogy insists teachers adopt Flipped Classroom approach for improving, enhancing, and making educational experiences more vibrant, dynamic, and unique. There are several reasons why flipping the classroom is significant for teachers and learners.

Consumption of Lecture Notes at learners Pace:

In a flipped classroom, there is an opportunity for students to study lecture notes at their own pace. Learners in Traditional classrooms are bound and dependent on instructors' pace. But in a flipped classroom, the learner can rewind and replay the video at any time to perceive the difficult concepts.

Quick and fast Feedback:

In flipped classroom approach, teachers are recognized as a resource, because learners usually apply new knowledge on their own through homework. When they have access to resources and get immediate help from teachers.

Flipping the classroom works:

Flipping the classroom requires technology to deliver course content to their learners. Videos, text, animation play a vast role in flipping the classroom. It is the responsibility of institutions to provide a platform to teachers and learners for recording and continuing this type of content material. Now in the age of digitalization, when technology is in the hands of every person, teachers including learners can take advantage of this new technique of pedagogical innovation.

How to flip classrooms in a better way?

It is not an impossible but challenging task for teachers to adopt flipped classroom approach. By following certain steps a teacher can flip his classroom in a better way.

Adopt Technology:

This is the first step for the Flipped classroom that teachers must adopt the technology. Because flipped class learning depends deeply on technology. Teachers of flipped classroom learning will create and share e-content in form of text, videos, etc. For this process, the Teacher has to pick a technology and decide how students will access all content. An LMS will help you keep everything streamlined in one place as you launch your program.

Videos and Content:

For flipping classrooms, there is a dire need to keep the content interesting, attractive, and short. Amazingly, a lecture that is supposed to take one hour to finish can be covered into a fifteen- or twenty-minutes video. Teachers may take help to explore videos and other interactive content from the quality open educational resource (OER).

Bask in the glow of stress-free teaching:

Once you have your video-making schedule underway you can start to reflect on how much less stress you have. Now, whenever a student is absent, they can still view your lecture online. Special education teachers and administrators will love you because they can now access your teaching directly. Parents now have no delusion that you don't know the material. You are available on demand. It's worth it the first time you hear that a student has used your videos to master the material.

Be clear with Students and Parents:

It is better to explain what is flipped learning and which type of activities would be covered before launching. Because flipping the mindset is not an easy task.

Make Your Students Accountable:

The flipped learning model is largely depending upon learner engagement and participation. Teachers must have a devised system that tracks and hold students accountable for watching their videos. The teacher must have LMS from which he ensures that students are working and progress is going on.

Carry on:

For flipped classroom approach, this is a mandatory requirement that there should be a proper schedule and system so that planning, recording, shooting, assessment can become scheduled.

Why you should flip your classroom?

- Flipping speaks the language of today's students.
- Flipping helps busy students.
- Flipping helps struggling students.
- Flipping helps students of all abilities to excel.
- Flipping allows students to pause and rewind their teacher.

- Flipping increases student-teacher interaction.
- Flipping allows teachers to know their students better.
- Flipping increases student-student interaction.
- Flipping allows for real differentiation.
- Flipping changes classroom management.
- Flipping changes, the way we talk to parents.
- Flipping educates parents.
- Flipping makes your class transparent.
- Flipping is a great technique for absent teachers.
- Flipping can lead to the flipped mastery program.

Process for implementing a flipped classroom:

Here presented 6 easy steps for implementing flipped classrooms.

1. Plan

Figure out which lesson, in particular, you want to flip. Outline the key learning outcomes and a lesson plan.

2. Record

Instead of teaching this lesson in person, make a video. A screencast works. Make sure it contains all the key elements you'd mention in the classroom. In Bergmann and Sams' book (2012), they also pointed out that does not make a video just for the sake of making a video. Only do so when you feel these are appropriate and necessary. It all depends on the educational goal of your lesson. If making videos better facilitate your instructional goal, then go ahead.

3. Share

Send the video to your students. Make it engaging and clear. Explain that the video's content will be fully discussed in class.

4. Change

Now that your students have viewed your lesson, they're prepared to go more in-depth than ever before.

5. Group

An effective way to discuss the topic is to separate into groups where students are given a task to perform. Write a poem, a play, make a video, etc.

6. Regroup

Strategies for the effective flipped classroom:

In a flipped learning model of teaching, students get first contact with new ideas not during class time but in structured independent activities done before class time. Some Strategies are given as below:

Abroach learning:

Allow students to apply concepts in class where they can ask peers or instructors for feedback and clarification.

Compeer instruction:

Students can teach each other by explaining concepts or working on small problems.

Collaborative learning:

Collaborative learning activities could increase student engagement, enhance student understanding, and promote collective intelligence.

Problem-based learning

Class time can be spent working on problems that can last for a semester.

Discussions or debate

Allow students to articulate their thoughts on the spot and to develop their arguments in support of their opinions or claims.

Flipped classroom activities:

Flipped classroom approach is a new paradigm of the 21st century where teacher-centered classrooms have been shifted to the learner-centered classroom. This is the need of the hour that teachers would design their lessons according to the Flipped classroom. There are some examples of flipped classroom activities that can be undertaken by teachers.

Assessment: Assessment is the core pillar of Flipped Classroom approach. Assessment can be formative, summative, or introductory type. In flipped classroom model, there is to make sure that learner must have background information about the concept which is going to be delivered. After the lecture, there must be the provision of feedback. MCQs, short answers may be taken as assessment devices as flipped classroom activities.

Question Generation: In a flipped classroom, students are allowed to clear their confusion or misperception with an active question-answer session. In this process, questions are generated by learners or teachers and via feedback, responses are collected.

Brainstorming Sessions: Brainstorming sessions are instrumental to flipped classroom learning. In this session, learners try to solve the problem, participate in the discussion or perform the targeted task.

Stay Active: Active learning is the main constituent of the flipped classroom to engage learners engaged with new material during class time or after the class.

Merits of the flipped classroom:

There are many advantages of utilizing flipped classroom approach, some including

Self-paced learning:

Students can be benefitted from flipped classroom approach because it provides an opportunity for them for self-paced learning i.e.as and when they want to learn, it gives autonomy to them for flexible learning times.

Depth Understanding:

This is the biggest advantage of Flipped classroom approach that this gives the learner autonomy for depth learning. From a basic foundation on a certain topic, learners can go to deeper learning material.

Better preparation:

In a flipped classroom, there are more and more assignments for mastery and a good understanding of the concept. So there is an opportunity for students to have better preparation.

Reuse Lectures:

Lecture notes can be further reused.

Create transparency:

Teachers and learners can easily keep track of performance and have good access to learning resources.

Demerits of the flipped classroom:

Instead of having applicable qualities of the flipped classroom, there are still some disadvantages of flipped classroom approach:

Technological Concerns:

If there is no access to the internet, it means there is study and no homework. It also creates inconvenience for learners and teachers.

It takes time:

Flipping the classroom, at first sight, is not so simple and easy. Setting up the first flipped course requires more time and energy and it is also difficult for teachers to introduce this concept with an old mindset. It is also a challenge to change the mindset. This change can take some time because they must learn how to move from a passive learning style to an active learning style.

Lack of motivation:

Sometimes, due to lack of motivation, students are neutral to do homework. Because it needs close monitoring.

Not for every student:

Flipped classroom learning is not suitable for every student. Students need to know the concept of Meta Cognitive Skills. It means they must know how to learn and which learning style suits them best. The flipped classroom requires a lot of self-discipline. But this will come with practice.

RESULTS AND DISCUSSION:

We have planned some research methodology for analyzing data for proving that, “why the flipped classroom is better than the traditional study method. We have gotten the information by the results of the students as below:

- 1) Total number of students: 60 (Electrical and IT students)
- 2) We had asked questions regarding the flip classroom. For example,
 - A) Is flip classroom useful in studies?
 - B) Is it Useful for improvement as well as concepts of subjects?
 - C) Is it inspired for the presentation session?

3) based on the answers of the students related to the flip classroom we have observed the analysis of the entire Questionnaire with help of the Bar chart: analysis of the Bar chart as here: * Strongly agreed student ratio is higher which is: 42. 3833 %

- 4) Here we have the analysis by

A) Traditional Class method:

In this method, teachers deliver lectures into the classroom Which is commonly used at an academic level. On this base, we got the result by analyses that: 57.409 %

B) Flipped classroom method:

In which we had provided lectures notes, videos, materials before class, and on that bases students had discussed regarding particular topic into group discussion and in the between-group discussion if they had any difficulties we had discussed and solved it. on that base, we got the analyses like: 61.602 %.

For both the method analyses we had shown with the help of Bar chart as shown below:

table1: items in the feedback questionnaire

Sr.No	Items of Feedback Questionnaire	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
1	Does flipped classroom was useful in my study?	50	46.7	1.7	1.7	1.7
2	Does flipped classroom was useful to improving my result?	51.7	33.3	15	1.7	0
3	Does flipped classroom was useful for the improvement of Knowledge?	48.3	48.3	6.7	2	0
4	Does flipped classroom was useful to improve my understanding of key concepts?	53.3	35	10	3.3	1.7
5	Does flipped classroom was time-saving?	41.7	30	20	6.7	3.3
6	Does flipped classroom provides transparency in-class test/assessment methods?	45	41.7	10	5	1.7
7	There is the interaction between more number of student-teacher or student-student.	55	38.3	13.3	0	0
8	The way the course was organized helped me to learn the material	36.7	48.3	13.3	1.7	1.7
9	Materials for out-of-class learning activities were available when needed	41.7	46.7	11.7	5	0
10	The flipped classroom session inspire me to Pursue further learning for the Module.	43.3	41.7	11.7	3.3	0

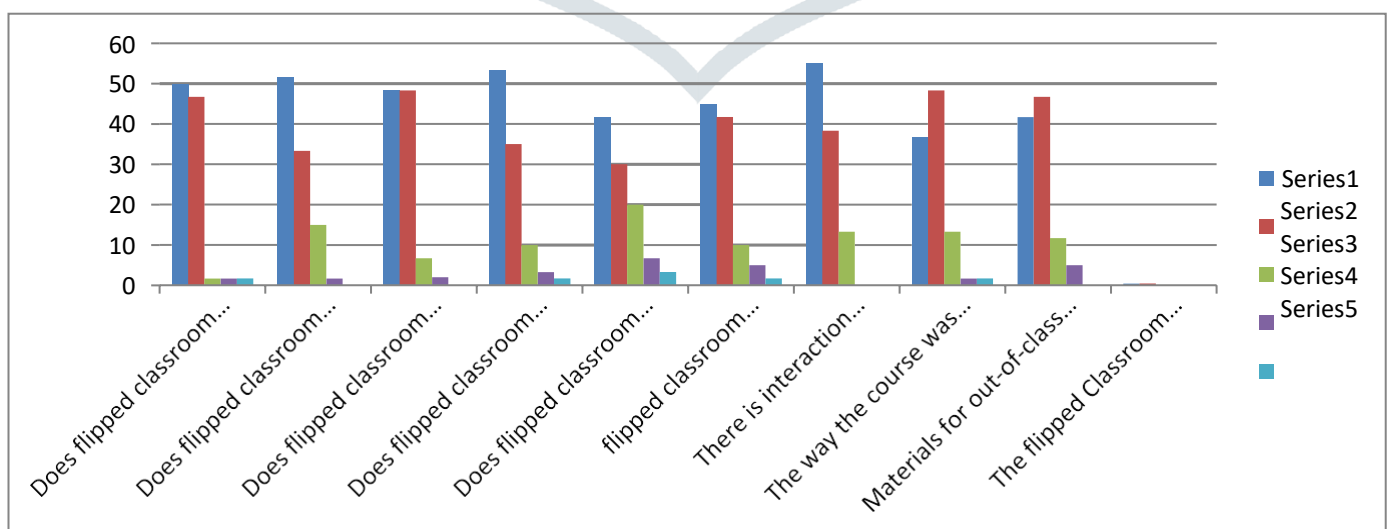


Fig 3 chart of feedback from the students of Questionnaire

The flipped Classroom session inspire me to Pursue further learning for the Module.

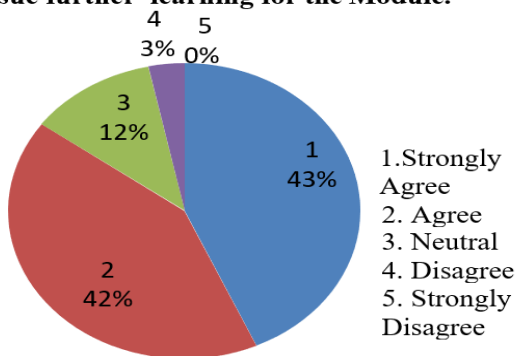


Fig. 4

Does flipped classroom provide transparency in-class test/assessment methods?

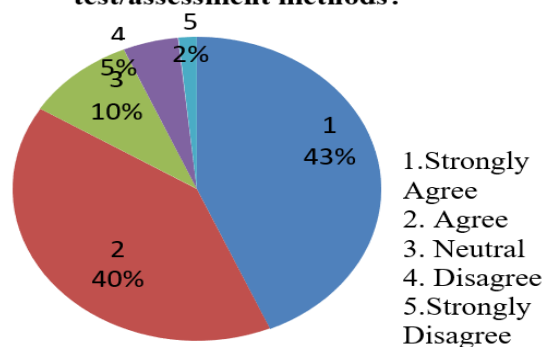


Fig.5

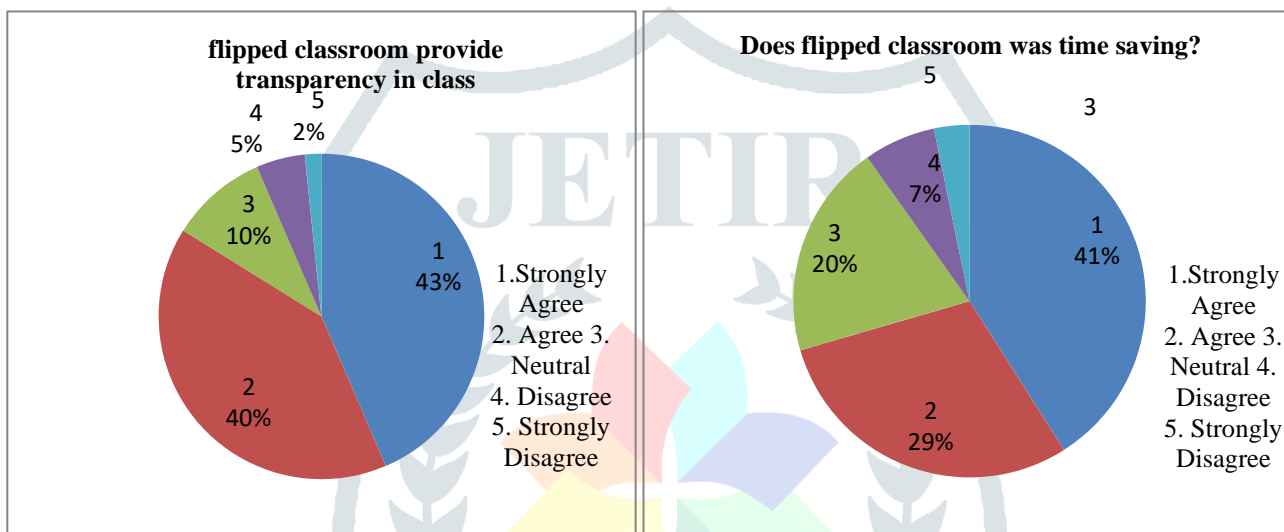


Fig. 6

Fig.7

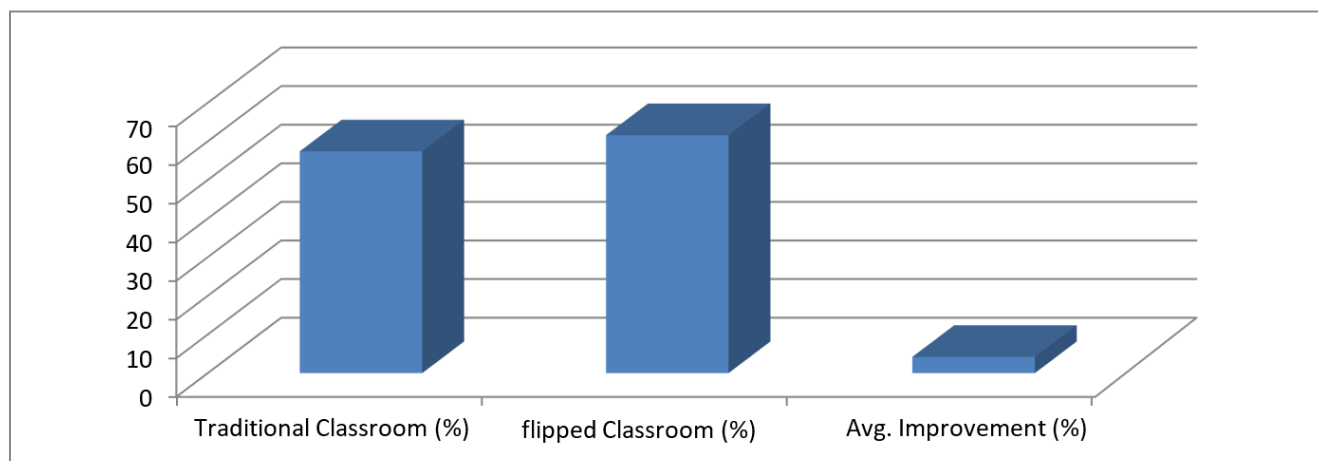


Fig:8 Result analysis for measuring Traditional classroom verses Flipped classroom method with improvement

CONCLUSION:

Flipped classroom approach is now considered an insignia of 21st-century pedagogy. It may be taken as an ideology not methodology. Students of this century are now termed millennial learners and keep technology in their hands. So, it is needed for the hour that traditional learning should be transformed into flipped classroom learning. The present module highlights the meaning, structure, advantages, and disadvantages of Flipped Classroom Approach.

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