

Flipped Classroom

A report on first implementation

Under the initiative of “Active Learning” by



Gujarat Technological University

By:



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Introduction

The **flipped classroom** is a pedagogical model in which the typical lecture and homework elements of a course are reversed. Short video lectures are viewed by students at home before the class session, while in class time is devoted to exercises, projects, or discussions. Through this method, teachers record their lessons using simple video capture software, and share them amongst the students through internet or other means and assign the recordings for online viewing prior to class and the classroom teaching hour can be used for collaborative activities.

This shift allows instructors to transition out of their role of “*sage on the stage*” and become facilitators, or “*guides on the side*” thereby allowing students to move away from being passive listeners and becoming active participants in the learning process

Key elements

The key elements of Flipped Classroom are:

- To provide an opportunity for students to gain first exposure to content prior to class.
- To provide an incentive for students to prepare for class.
- To provide in-class activities that focus on higher-level cognitive activities.
- To provide a mechanism to assess student understanding.

Scope of the research

The FLIPPED Classroom concept in this project is being implemented to the **Sixth Semester** students of **Automobile Engineering Department** for the subject **Vehicle Air Conditioning (3360204)**. Since there are 19 students in total which is less in comparison to other branches, it would be advantageous in controlling and monitoring the progress of the project.

The duration of this project would be of one semester.

Expected Outcome

The case studies of implementation of flipped classroom concept in some reputed universities across the world show a positive result of the implementation of this concept of pedagogy. However the concept is new in Indian education scenario.

The following outcomes are being expected from this project:

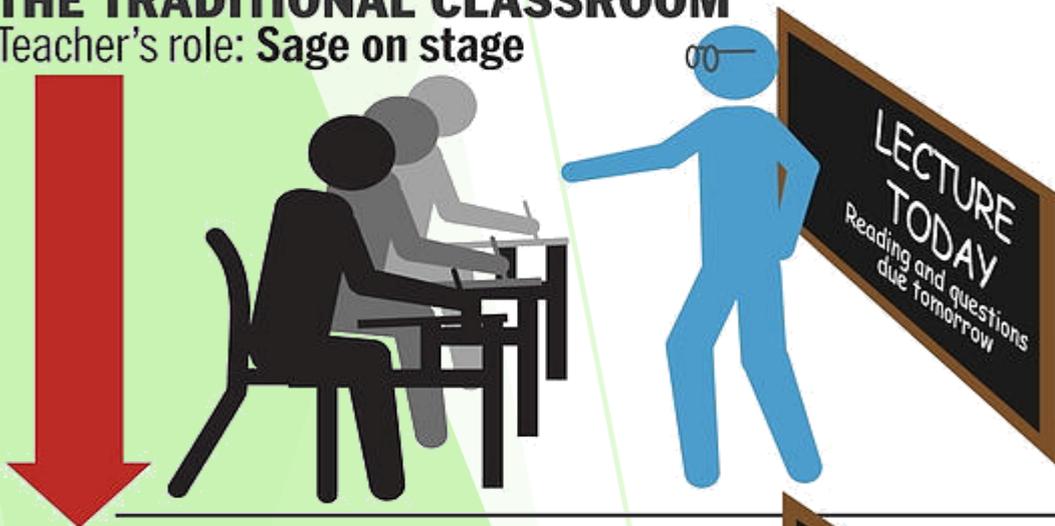
- Students will be exposed to collaborative learning environment.
- The students will develop better understanding of the concepts and principles.
- The problem solving skills of the students will be improved.
- It will help students to perform better at end semester examination.

Methodology

- At first stage the learning materials like videos and Presentations are prepared for first few lecture topics and the remaining shall be prepared as the course progresses.
- The students are provided with these materials at the beginning of the week and a schedule of topics for discussion is also declared.
- Students refer the material at their home and come to the class for discussion and problem solving.
- Their performance of students in the class will be judged by a number of quizzes spread throughout the course duration.
- They will also have to submit the online assignments which are

THE TRADITIONAL CLASSROOM

Teacher's role: Sage on stage

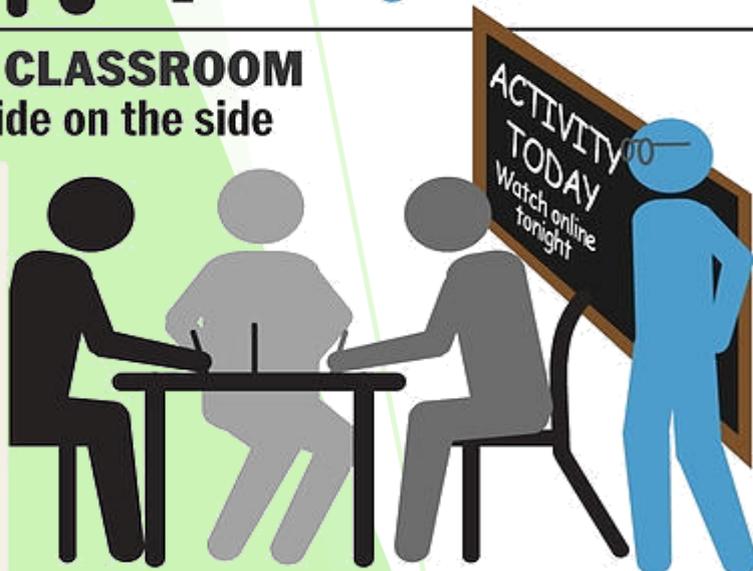


THE FLIPPED CLASSROOM

Teacher's role: guide on the side

• Students watch lectures at home at their own pace, communicating with peers and teachers via online discussions

• Concept engagement takes place in the classroom with the help of the instructor



Picture Source: <https://andyjamespiper.files.wordpress.com>

Implementation at

Laxmi Institute of Technology

At Laxmi Institute of Technology, The Flipped Classroom concept in this project is being implemented to the **Sixth Semester** students of **Automobile Engineering Department** for the subject **Vehicle Air Conditioning (3360204)**.

Google Classroom is being used as IT platform to share the study materials and monitor the progress of the class. Google Classroom is now available for free for Apps user

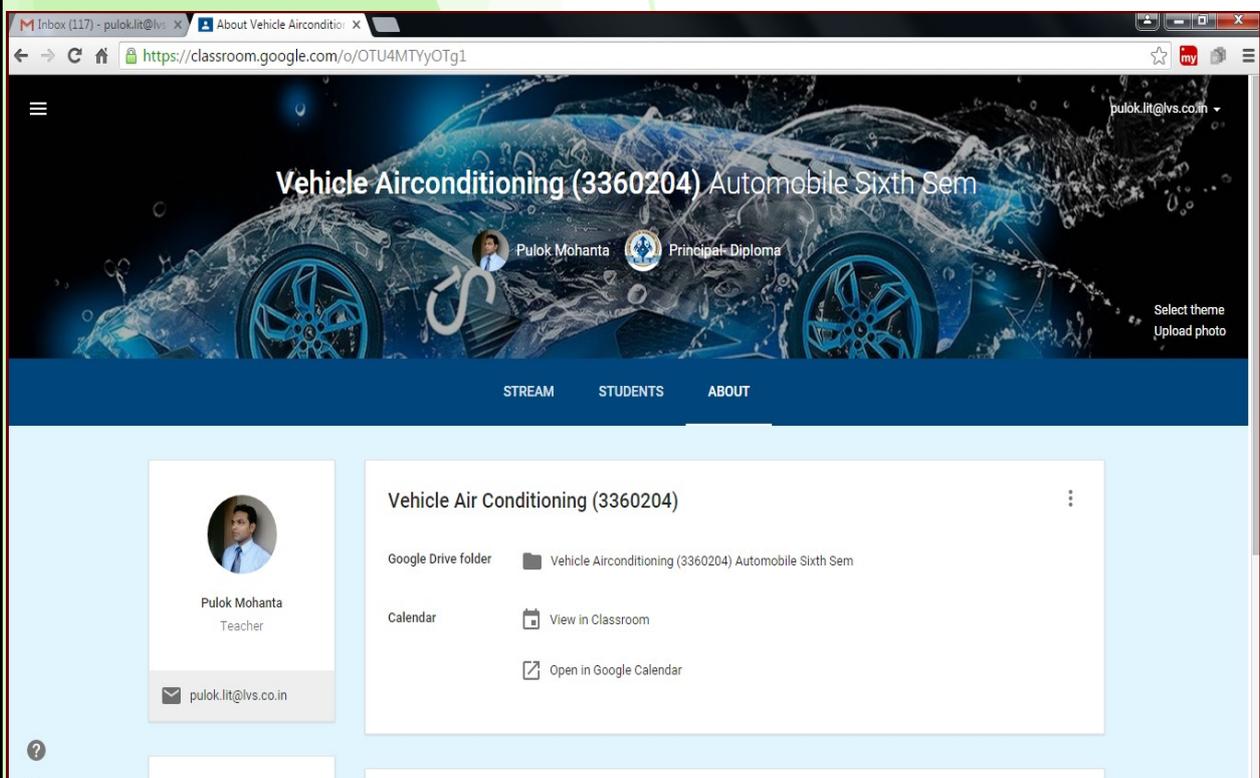


Figure 1. The Digital Classroom of Automobile Engineering Sixth Semester

After creating the Class, Students were invited to join it.
A demo Class was organized for the students on How to access the
Google Classroom on 18th February, 2016.





Study materials like PDFs and Videos are being posted to the class to be referred by the students at their home.

Inbox (117) - pulok.lit@lvs... x Vehicle Airconditioning (3... x

← → ↻ 🏠 🔒 <https://classroom.google.com/c/OTU4MTYyOTg1> 🔍 🌟 my 📱 ☰

☰ **Vehicle Airconditioning (3360204)** Automobile Sixth Sem **STREAM** STUDENTS ABOUT pulok.lit@lvs.co.in

Study Material #2

 valeoairconditioningvaleoscopetechnicalbrochure-achandbookpart1998321-131107104512-phpapp... PDF

 Add class comment...

  Pulok Mohanta Feb 18 (Edited 9:48 AM) DUE MAR 30

Study Material #1 2 7
The material can be referred as teaching aid. DONE NOT DONE

 Automotive Air Conditioning Training Manual.pdf Each student will get a copy

 Add class comment...

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+

Vehicle Airconditioning (3360204)
Automobile Sixth Sem

STREAM STUDENTS ABOUT pulok.lit@lvs.co.in

Home Work # 2
VIEW ALL

Home Work # 2
To view the Video on How To Find and Repair AC Leaks

0 DONE 9 NOT DONE

STREAM
Show deleted items

CLASS CODE
Students can join the class with this code:
4ab0ou

Pulok Mohanta
Mar 3

How To Find and Repair AC Leaks

How To Find and Repair AC Leaks.mp4
Video

Home work and assignments are also posted to the class and the same is also announced during the class. They are also intimated with the deadlines.

Vehicle Airconditioning (3360204)
Automobile Sixth Sem

STREAM STUDENTS ABOUT pulok.lit@lvs.co.in

Due Tuesday
Home Work # 2
VIEW ALL

Assignment #01
Introduction to Airconditining

0 DONE 9 NOT DONE

STREAM
Show deleted items

CLASS CODE
Students can join the class with this code:
4ab0ou

Pulok Mohanta
10:38 AM

Due MAR 12, 11:59 PM

Google Forms - create and analyze surveys, for free.
<http://goo.gl/forms/wB8FFs63bP>

The screenshot shows the 'STUDENT WORK' view for 'Study Material #1'. The top navigation bar includes 'INSTRUCTIONS' and 'STUDENT WORK'. A 'RETURN' button and a '100 points' indicator are visible. The left sidebar shows a list of students with checkboxes for 'Done' and 'Not done'. The main area shows a summary of work completion: 2 DONE and 7 NOT DONE. Two student work items are displayed: ANSARI NURULHAQUE and PATEL NIKUNJ, both with 'Done' status and a thumbnail of the 'Automotive Air Conditioning Training Manual'.

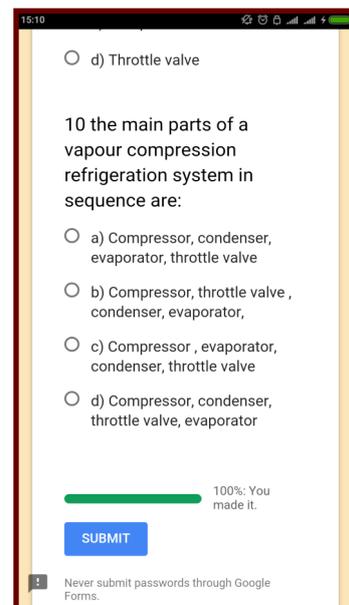
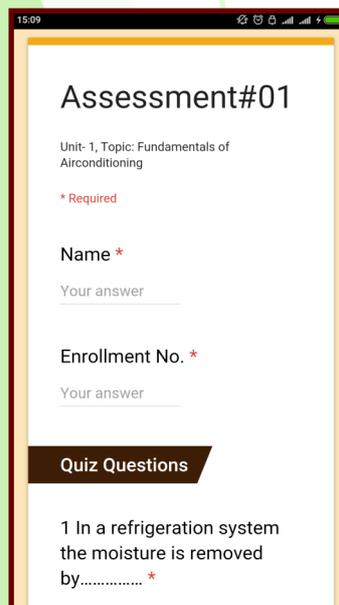
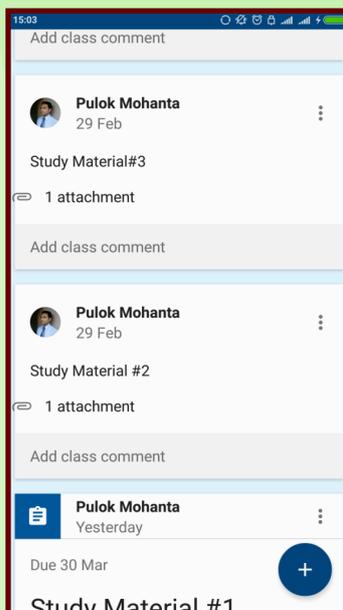
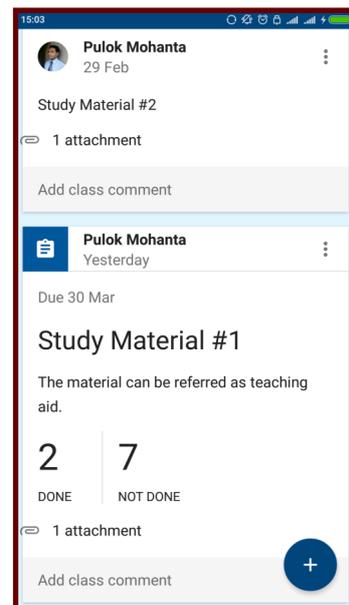
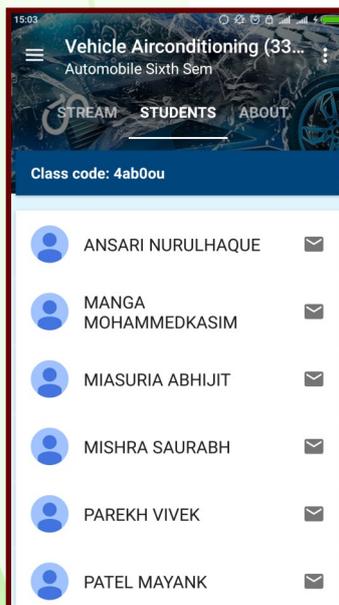
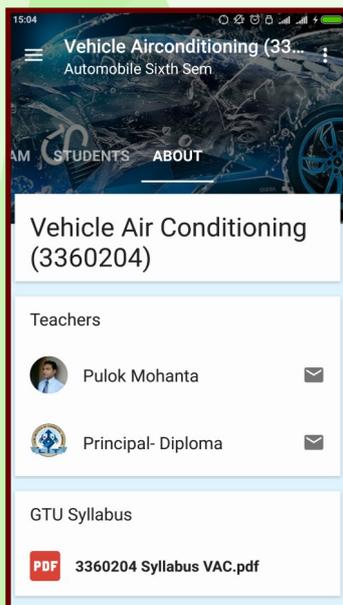
Through Google Classroom it becomes easy to check whether the students have completed the assigned homework or not.

The screenshot shows the 'Work' view for 'Vehicle Airconditioning (3360204)'. The top navigation bar includes 'TO REVIEW' and 'REVIEWED'. The main area shows a table of work items:

Work Item	Done	Not Done	More Options
Study Material #1 Vehicle Airconditioning (3360204) Automobile Sixth Sem – due Mar 30	2	7	⋮
Home Work # 2 Vehicle Airconditioning (3360204) Automobile Sixth Sem – due Tue, Mar 8	0	9	⋮

Mobile Compatibility

All the components of the class as described in the deskto version can also be accessed through mobiles by using the Google Class app.



Discussion session

After the demo of Google Class, the students were taken for a discussion session. Students felt more active during the discussion and found it more interesting while sharing each others knowledge and understanding.



Pitfalls

Although Flipped Classroom promises of greater effectiveness over traditional classes, the following pitfalls were faced

- Students are new to this method. So initially they were resistant because it requires that they do work at home rather than be first exposed to the subject matter in class. They perceived it to be extra load. Situation seems to be improved as they are getting used to.
- At the beginning they were coming unprepared to class to participate in the active learning phase of the course. This problem is being addressed by giving a short quiz either online or in class or by requiring homework that references information that can only be obtained from the outside reading or videos.
- Students are not referring the materials at the appropriate time, subsequently delaying the assignment submission. It is being tried to include their assignment score for progressive assessment to make the more sincere.
- Some students are having poor proficiency in English. As they are pursuing their education in Gujarati medium. Since most of the study materials videos, ppts, PDFs etc available are in English, they getting limited benefit out of this method
- Some students complained of poor internet connectivity at their home. For these students, the materials are being distributed using other technologies like Bluetooth, USB sticks etc. for submission of assignments, they can access the class with their android devices by installing the Google Classroom app.

Conclusion

Despite the challenges faced, the Flipped Classroom is being gradually getting more popular among students as well as teachers of various domain. It has the potential to be proved as a novel and effective teaching approach for engineering education. The format of the Flipped Classroom will provide more opportunities for students to engage in critical thinking, independent learning and more effectively collaborative learning. Continuous effort are being put to implement the concept more effectively. The responses of the students are being recorded and the performance will also be judged. Successful implementation for the present class will definitely motivate to implement the concept for other classes as well.

References

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