

Project Report :

Title: Proposal for Course delivery inspired by the ITP workshop

By: Gautam Karve

Project brief provided by Dr. Ambar Jain:

- 1) What is the course you are teaching?**
- 2) What changes you would like to make to the course curriculum (about course content: add/delete) and why?**
- 3) What new ideas or methods inspired you at the ITP workshop that you would like to implement (2/3 ideas) and why?**
- 4) How will you implement?**

I teach Physics at Avantika University for the foundation course of B.Tech students.

The present curriculum aims to deliver typically the basic Physics modules like Mechanics, Electromagnetism, and Modern Physics. Within these modules there are multiple topics like Newton's laws, energy conservation, kinematics etc. Every course in Avantika University typically runs for 2 to 6 weeks depending on the credits. In these few weeks only one particular course is taught for the entire day, with two sessions- morning and evening. Physics course is a 4 week course.

Inspired by the ITP workshop, I would like to make a few changes to the curriculum. I plan to include only two or three topics of the physics syllabus in the classroom teaching. My focus will be primarily on teaching techniques to help the students grasp how to learn a new and complex topic of Physics. In other words I will focus on the aspect of 'HOW to learn' rather than 'WHAT to learn'.

The students armed with this 'HOW to learn' knowledge will then be assessed in a novel way. For their project, the students are expected to learn a topic that would be different from the topics that were dealt in the class, yet a topic within the syllabus. They will be evaluated using a continuous and a summative assessment that would test their understanding of the topics that they learn themselves by self study or collaborative study. The summative assessment will test two major components-1) numerical problem solving skill, and 2) ability to qualitatively analyze a phenomenon in terms of its physics.

The techniques that I plan to talk about in class are-

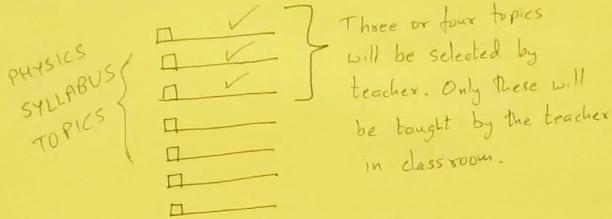
- 1) Creating and using analogies,
- 2) Watching videos on chosen topics on websites like Khan Academy
- 3) Socratic discussion
- 4) Solving physics numerical problems in groups.
- 5) Keeping technical lego blocks or even simple objects like clay, wooden blocks, strings, rubber bands etc. available on the table for the students to get a multisensory feel for the subject.
- 6) Making use of free simulations for helping the students have a grasp on complex experiments

I plan to divide the students in groups and call the groups one by one to my office/classroom for discussing a few physics questions by way of Socratic discussion where I act as a moderator and observer. My role would be to pose leading questions and correct the group if it goes in a completely wrong direction. I expect this kind of discussion to help make the students aware of misconceptions and also let them express their line of thought verbally. Some elements of flipped classroom could be incorporated here. The students will need to watch a few videos and read a few books before they come to the class. Also their understanding could be evaluated using software like EXAMINEER, which is very suitable for subject like Physics.

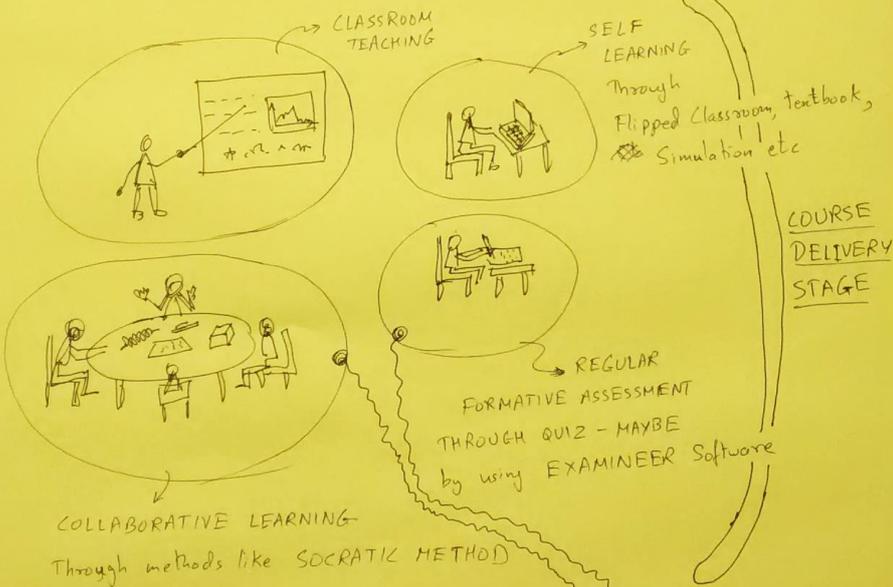
I have summarized these points in the form of a chart in the next page:

PROPOSED FORMAT FOR PHYSICS COURSE DELIVERY AT AVANTIKA UNIVERSITY, UJJAIN

Prepared during and as part of activity conducted at IIT, IISER-Bhopal, June 18



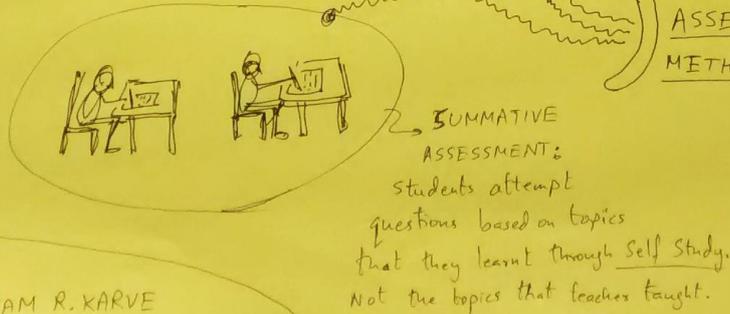
CURRICULUM STAGE



COURSE DELIVERY STAGE

REGULAR FORMATIVE ASSESSMENT THROUGH QUIZ - MAYBE by using EXAMINEER Software

ASSESSMENT METHODS



BY:-
GAUTAM R. KARVE
AVANTIKA UNIVERSITY, UJJAIN