

Flipped Classes in Civil
Engineering: Is it really
useful ?

Roger Subramanian



PennState
Harrisburg



WONDERWORKS







What is Flipping of classes

- Opposite to traditional style of teaching with only lectures

Why do you do Flipping of classes ?

- Whole bunch of reasons



isolated

disconnected

bored

disengaged

daydreamers

asleep

Why do you do Flipping of classes ?

- Grab attention
- Effective teaching

How Flipping of classes started ?

- Those who missed classes will use class lecture videos to catch up

Different ways of Flipping of classes

- Video watching at home and come prepared for class
- Group Problem Solving
- At the end of class Quiz
- Debate on topics or concepts
- Group Discussion: Need preparation at home

Different ways of Flipping of classes

- Classworks
- Site Visits
- Guest Speakers: Experts from Industry
- DVDs

Different ways of Flipping of classes

- Internet websites featuring tools, softwares
- Latest industry news accessed thru internet

Flipped Class-setting

- Faculty interaction with students by discussion: particularly confusing concepts
 - Providing real-life examples relevant to course content

Flipped Class-setting

- Challenging students to think more deeply about complex processes
 - Monitoring peer-to-peer, team-based learning activities

Advantages - Students

- Learn at their own pace
- Peers engagement on ideas, concepts
- Suits different personality types
- Suits different learning styles
- Less frustration levels

Advantages - Faculty

- Closely work with students
- Students attitudes improved
- Faculty can group the students together
- Improve student's solving capability by interacting with each other and analyzing the problems

Disadvantages

- Grading & Evaluating student's capacity may become difficult
- Keeping everyone on the same topic can be tricky
- Could promote lazy atmosphere
- Depending on students' motivation heavily

Disadvantages

- Internet accessibility could be a problem
- Space inside classroom difficult to adjust

Positive Feedback for videos

- Students liked how they were not rushed in class to move at the pace set by the teacher and that it was a more relaxed environment
- It's great to be able to catch up and/or get ahead if you're going on vacation, or miss school due to extra-curricular activities."

Positive Feedback for flipping class

- Having more time in class to work on problems and activities was also an advantage of the Flipped Classroom.
- It's a lot more relaxed in class; you aren't really pressured and put on the spot a lot. It makes Engineering more relaxed so I can actually understand it. "

Positive Feedback for flipping class

- We learned more than we would have learned in a 'normal' class“.
- Not boring.

Negative Feedback for flipping class

- Some students responded that they felt that the pace of the class, even though it was self-paced, was too quick. They had a difficult time keeping up and said that they always felt rushed.

Negative Feedback for flipping class

- Some students could not immediately ask a question when they were at home watching a lesson video.
- One observed that, "if the video doesn't explain a concept well enough, you will likely get frustrated and give up."

Negative Feedback for flipping class

- In Maths, Physics, Engineering flipping is o.k
- Not in history, social studies, ad other courses.

Flipping with Less Resources

- Not enough space.
- Not enough computer rooms with internet access.

















Flipping the Large classes

- More than 100 students
- More than 500 students



Igneous dikes exposed on a sea cliff, Island of Madeira

What is the oldest rock
A or B or C?









More work for faculty ?

- As a result, introducing a flipped classroom means additional work and new skills for the faculty.

Conclusions

- Increasing the amount of in-class activities
- New tools emerge to support the out-of-class portion of the curriculum.

Conclusions

- The rapid development of portable electronic devices will put a wider range of educational resources into the hands of students at anytime and anyplace.
- Currently, more audio and video educational resources can be obtained with the popularization of internet and information technology.

Conclusions

- Developed social network brings a better platform for learners around the world, which greatly reduces the threshold of online learning.

Conclusions

- Only 10% of students don't like flipping
- Rest of the students are o.k.

Conclusions

- As an Instructor I don't like the flipping because of grading difficulties.
- Sometimes when I teach large classes I get TA's for grading.
- I like it 100%. But I want only 50% flipping and 50% traditional for Civil Engineering