Teaching Methodology (Active Learning)

Prepare By :

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Traditional way of teaching

- Chalk and talk Method or Power Point Presentation
  - Students not pay utmost attention.
  - Students assume that they understand.
  - Teacher ask question often answered by few .
  - Assignment may be challenging, boring and leads to copying.

- Teaching Methodologies are teaching or instructional strategies that come under Active Learning .

- Active Learning : Approach to teaching and learning whose goal is to engage the students with the content.

- Active learning helps students to increase conceptual understanding.

- Through AL students can go beyond the listening the lecture, copying the notes or execute the prescribed procedure etc.

Features of Active Learning

- Problem Solving capabilities .
- Student can Figure out things themselevs.
- Increase the reasoning capabilty.
- Students work collaboratively.
- Rapid feedback of work.

Some Active Learning Strategies

- Think-Pair-Share
- Peer – Instruction
- Fllip class room
- Role-play
- Skit

Think-Pair Share

Consider your class in the class room

Think (Individually):

Predict the percentage of students who may be showing “engaged” behavior (with the content of the lecture), at various instants of time.

Draw a graph of engagement versus time.

Think-Pair Share

Pair (with your neighbor):

Examine each other's graphs.

Together, come up with three techniques that could be used to convert your graph into something that looks like the figure shown.

Share (entire class):

Create a combined list of techniques.

Discuss pros and cons of each technique.

Identify top three techniques that are likely to "succeed"

TPS - Definition

- Collaborative, active learning strategy, in which students work on a problem posed by instructor,

  First individually (Think),

  pairs (Pair) or groups, and

  finally together with the entire class (Share).

TPS - Definition

T (Think): Teacher asks a specific question about the topic.

P (Pair): Teacher asks another question, related to the previous one, that is suitable to deepen the students' understanding of the topic.

S (Share): Students share their thinking (or solution) with the entire class. Teacher moderates the discussion and highlights important points.

TPS-Benefits

- Students are actively engaged.
- Students learn from each other (social process, teach=>learn).
- Students can tackle large and ill-structured problems, and develop the ability to consider multiple points of views.

- Makes class interactive.
- Students realize that even others are struggling.
- Builds a friendly, yet academic atmosphere.
- Includes all the students in the teaching-learning process.

TPS

Think, Pair, Share is a structure first developed by Prof. Frank Lyman at the University of Maryland in 1981

Another Activity

Q : Which of the following is renewable energy source.

1. Coal.
2. Wind
3. Petroleum
4. All of the above.

Peer-Instruction

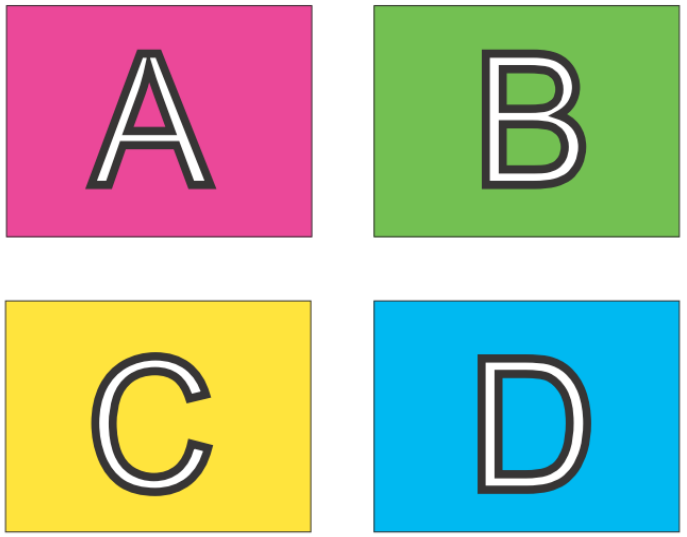
- Developed by Prof. Eric Mazur, Harvard University , Early 1990.
- PI is a class Room Active Learning strategies based on specific ,well designed questions.

Peer Instruction- The Flow

1. Ask Question
2. Answer (Vote) by students
3. Peer Discussion
4. Answer (Vote) by students
5. Lecture

Peer Instruction- Implementation

Peer Instruction- Implementation



Peer Instruction- Research

- 300 + research article
- Use google
- Courses using PI outperform
- Students become more able to answer the question by their own.

Experience report: peer instruction in introductory computing

Abstract: Peer Instruction (PI) is a pedagogical technique to increase engagement in lectures. Students answer a multiple choice question (MCQ) typically using clickers (hand-held remote devices with a minimum of 5 option buttons), discuss the question with their peers, and then answer the question again. In physics, PI has years of evidence of increased conceptual learning, as measured by the Force Concept Inventory (FCI)[7]. In this experience report, we describe how PI was applied in CS1 and CS1.5 courses teaching Java. We identify specifics of the standard PI model which were adopted, adapted, or discarded for use in introductory computing, describe the process involved for the instructor, give examples of the types of questions asked of students, report on students' performance in answering these questions, reflect on the value for the instructor, and report the attitudes and opinions of the students. We conclude with observations, advice and suggested improvements.

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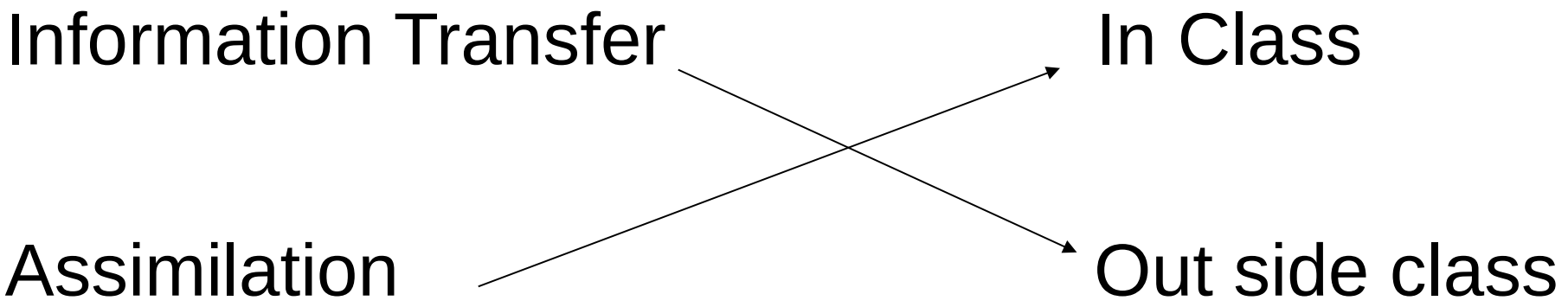
Peer Instruction- Benefits

1. Students are engaged in problem solving activities in the class room.
2. Specific student ideas are elicited and addressed.
3. Students work collaboratively.
4. Students express their reasoning capability
5. Students and Teacher received rapid feedback.

Flipped Class Room



Flipped Class Room

- Video lecture is key component.
- Short video lecture viewed by students at home.
- In class – exercise and discussion
- Self prepared video (www.spoken-tutorial.org)
- Available videos of renowned professor
- NPTEL : E-Learning course form IITs and IISc.

Flipped Class Room

Why it is Good Idea ?

- Flipped class room with peer instruction results in significant learning gain , compare to traditional instructional.(Prof. Mazur-2001)- Prof Shridhar,IITB.
- It helps students to work on higher cognitive level.

References

[1] Think-Pair Share : An Active learning Strategy – Prof. Shridhar, IITB.

[2] Peer Instruction : An active learning strategy to promote student conceptual understanding. - Prof. Sahana Murthy, IITB.

[3] http://en.wikipedia.org/wiki/Peer_instruction

Thank You