# Innovative Methods Of Teaching

Innovative Methods of Teaching

During a lecture in a Traditional method of teaching students assume a purely passive role and their concentration fades off after 15-20 minutes. Teachers often continuously talk for an hour without knowing students response and feedback and the material presented is only based on lecturer notes and textbooks. There is insufficient interaction with students in classroom.

1. MULTIMEDIA LEARNING PROCESS
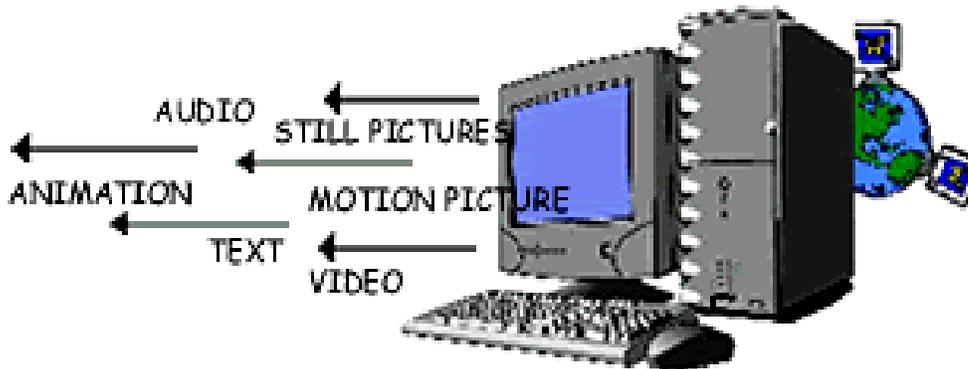
   Make the students more motivated and to pay more attention to the information presented and retain the information better.

2. TEACHING WITH SENSE OF HUMOUR

   Humor in teaching is a very effective tool for both the teacher and student. Humor not only plays an important role in the healing process but is also very important in education.

3. Z TO A APPROACH

   Explain the application of a particular concept first and explain the effects of such applications.

   ✓ Makes a particular concept clear
   ✓ Students develop interest to know exactly the concept.
   ✓ Creates long lasting memory/correlation of a concept.

4. Encouraging engagement

   a) Short writing tasks   : Halfway through the class, give students ten minutes to write a   postcard-length explanation of what the class is about.

- Short writing tasks aid learning by putting students in the place of the teacher by asking them to explain a subject, concept or problem to a specific audience.
- Help students develop their writing skills and prepare for larger pieces of assessment.

b) Ask one exam question: Ask students to suggest one exam question they'd like to be asked on a particular topic.

- This gets them to think about things from the expert/examiner's point of view.
- You could offer a prize for the best one to avoid silly suggestions.

c) Article reference : Take an article that's relevant to your subject from a Newspaper/magazine/website.

- Spend a few minutes at the start of the lecture getting students to use the material from your previous lecture in order to enhance the article's meaning.
- This helps in three ways:

    i. Applying knowledge is important in itself;
    ii. Some students learn much better when the material is related to something 'in the real world'.
    iii. It helps students answer questions in job interviews.

d) Change of tactics : Always be prepared to change tactics or activities mid-stream.
- Adapting to the group that you are teaching produces better results than inflexibly sticking to your teaching plan.

- Brief, interesting digressions are a useful tactic for holding the interest of a class, especially when teaching the technical points.

e) Stop and ask : Stop your lecture halfway through and get the students to explain one thing they've understood to the people around them. When you're obliged to teach something yourself you learn it more deeply than you had done previously.

5. Flipping the lecture

Ask the students to watch your lecture online prior to the timetabled teaching slot.

Spend the contact time discussing the subject with them. When students come to class they no longer have to sit in a lecture style format. They can go into a variety of group work or problem-based learning. You the teacher can give the student exactly the environment they need to be successful. It also helps students become self learners at home. Our students become college and career ready. Flip classroom also transforms your class time to be 100% student-centered.
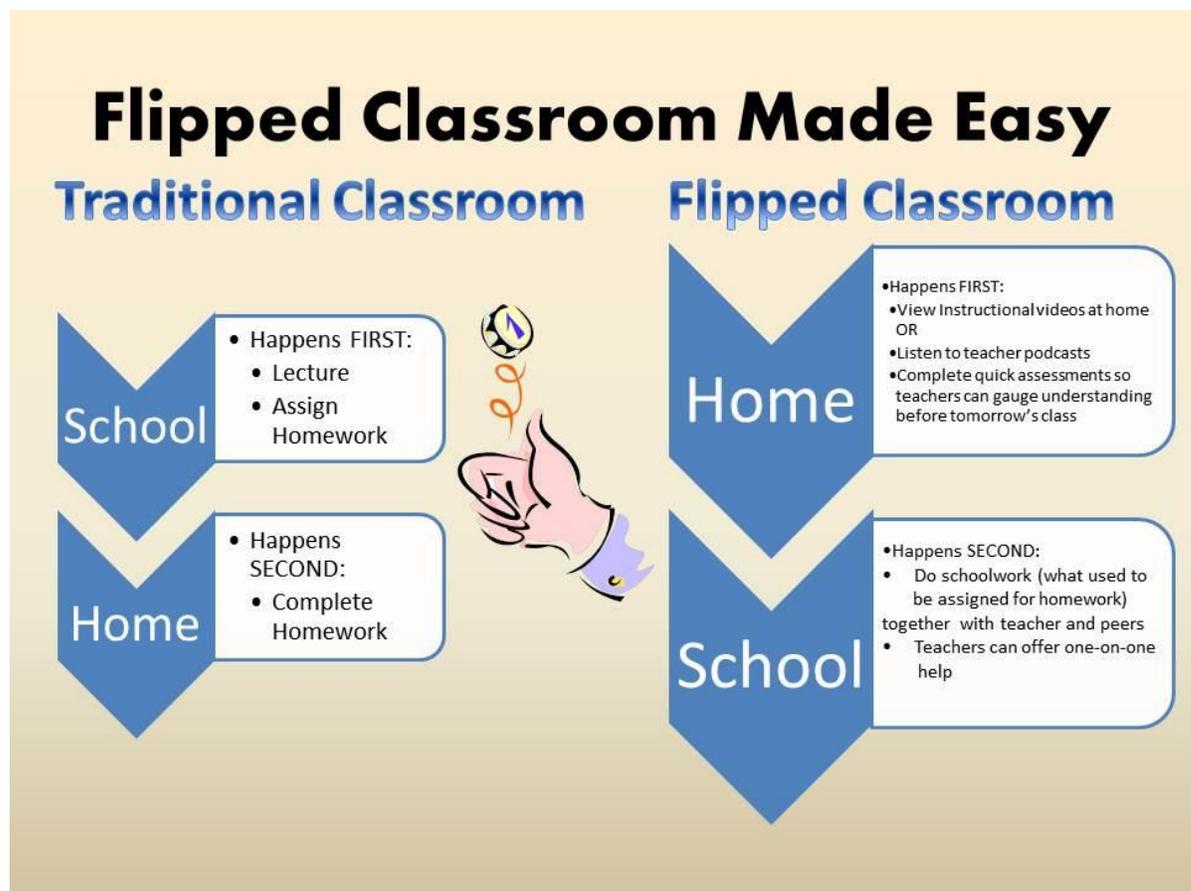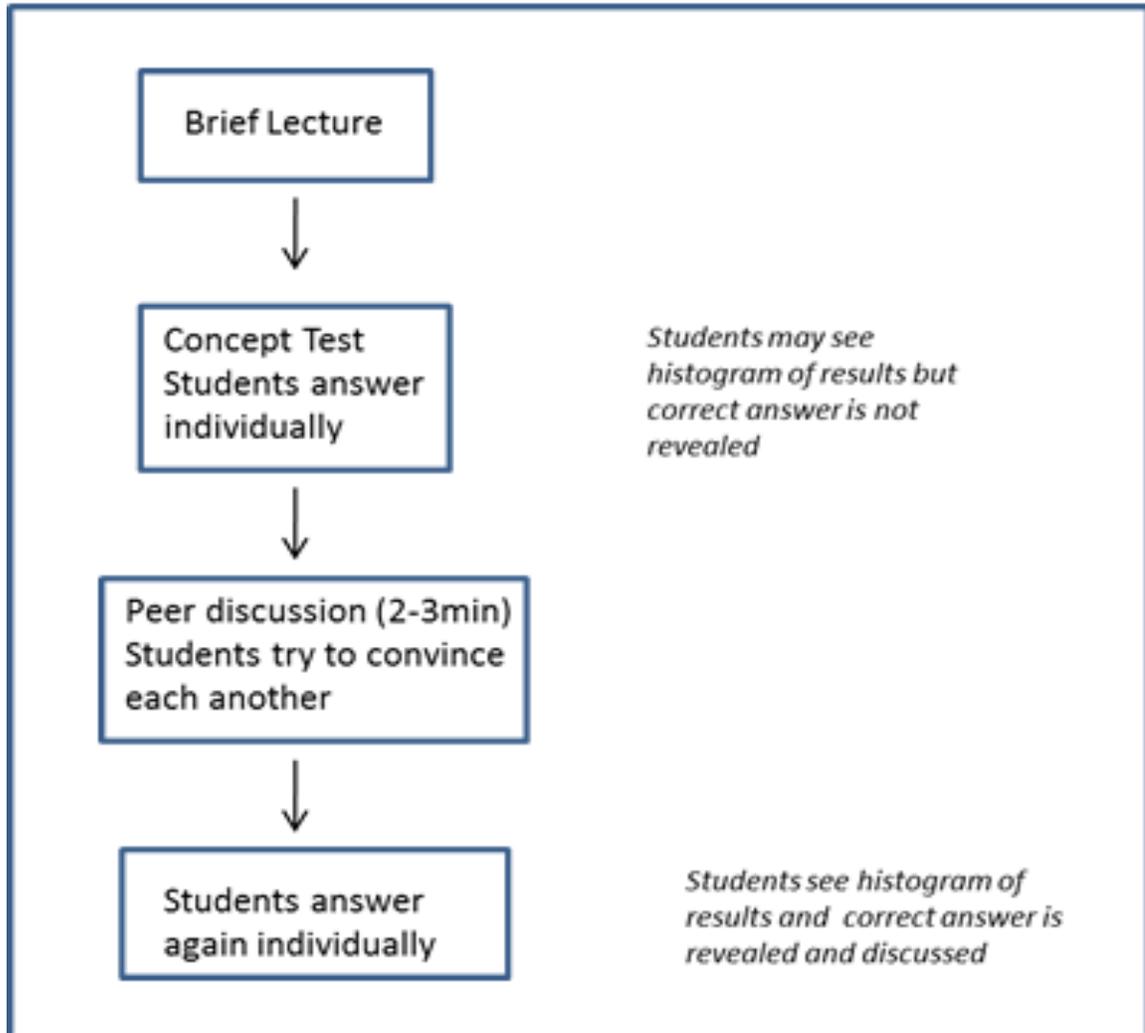

6. Peer Instruction

It involves students in their own learning during lecture and focuses their attention on underlying concepts. Lectures are interspersed with Concept Tests, designed to expose common difficulties in understanding the material. The students are given one to two minutes to think about the

question and formulate their own answers. They then spend two to three minutes discussing their answers in groups of three to four, attempting to reach consensus on the correct answer.

This process forces the students to think through the arguments being developed, and enables them (as well as the instructor) to assess their understanding of the concepts even before they leave the classroom.

```
┌─────────────────┐
│  Brief Lecture  │
└─────────────────┘
        │
        ↓
┌─────────────────┐          Students may see
│ Concept Test    │          histogram of results but
│ Students answer │          correct answer is not
│ individually    │          revealed
└─────────────────┘
        │
        ↓
┌──────────────────────┐
│ Peer discussion (2-3min) │
│ Students try to convince │
│ each another          │
└──────────────────────┘
        │
        ↓
┌─────────────────┐          Students see histogram of
│ Students answer │          results and  correct answer is
│ again individually │       revealed and discussed
└─────────────────┘
```

7. Minute Paper

A concise note (taking one minute!), written by students (individually or in groups), that focuses on a short question presented by the instructor to the class, usually at the end of the session.

The Minute paper provides real-time feedback from a class to find out if students recognized the main points of a class session—or were confused by them!

A presentation on "INNOVATIVE TEACHING METHODS" was carried out for all faculty members .The faculty members are requested to adapt at least one method during their classes.
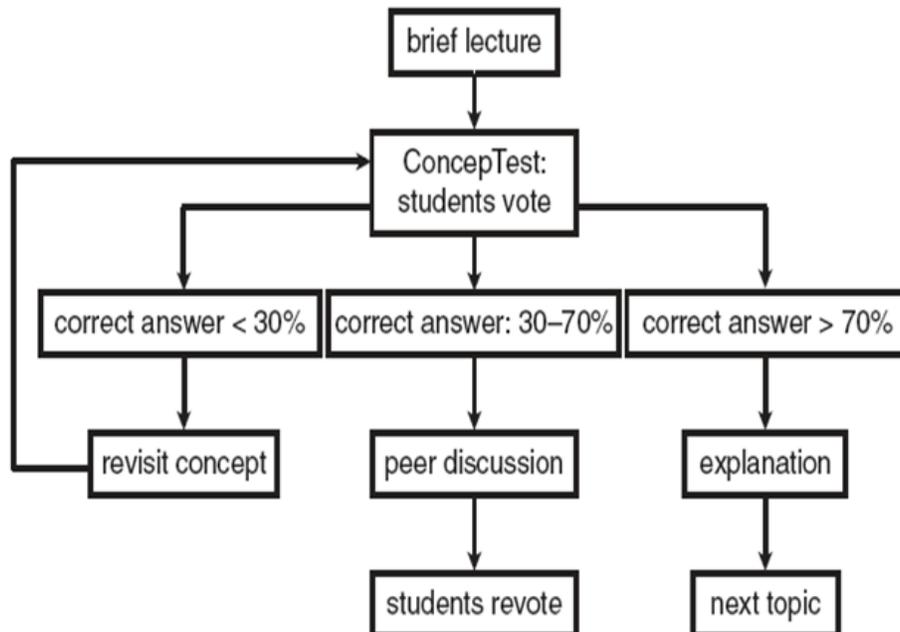
8. Peer Instruction

In class testing of concepts via multiple choice that answers individually 1st then after discussing in groups vote as a team.

Methodology that involves all the students to apply and explain the concepts of the class

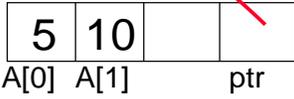Small number of short lectures focused on key points.

Concept Tests in multiple choice format.

Peer Instruction Examples

Peer Instruction Example

```
int main(void){
  int A[2], *ptr;
  ptr=A;
  A[0]=5; A[1]=10;
  printf("%u %d %d %d\n",ptr,*ptr,A[0],A[1]);
  ptr = ptr + 1;
  printf("%u %d %d %d\n",ptr,*ptr,A[0],A[1]);
  *ptr = *ptr + 1;
  printf("%u %d %d %d\n",ptr,*ptr,A[0],A[1]);
}
```
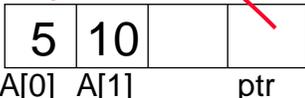
| 5 | 10 | | |
A[0] A[1]   ptr

If the first printf outputs 100 5 5 10, what will the other two printf output?

1: 101 10 5 10   then 101 11 5 11
2: 104 10 5 10   then 104 11 5 11
3: 101 <other> 5 10 then 101 <3-others>
4: 104 <other> 5 10 then 104 <3-others>
5: One of the two printfs causes an ERROR
6: I surrender!

Peer Instruction Answer

```
int main(void){
  int A[2], *ptr;
  ptr=A;
  A[0]=5; A[1]=10;
  printf("%u %d %d %d\n",ptr,*ptr,A[0],A[1]);
  ptr = ptr + 1;
  printf("%u %d %d %d\n",ptr,*ptr,A[0],A[1]);
  *ptr = *ptr + 1;
  printf("%u %d %d %d\n",ptr,*ptr,A[0],A[1]);
}
```

| 5 | 10 | | |
A[0] A[1]   ptr

If the first printf outputs 100 5 5 10, what will the other two printf output?

2: 104 10 5 10   then 104 11 5 11

…because ints in this system are 4-bytes long and the actual address increments by 4 even though it appears to only incrememt 1.

° **Suppose you have a 32M×32 Random Access Memory (RAM) chip. Which statement about the RAM is true?**

° **Note K = 2^{10}, M=2^{20}, G=2^{30} and 2^5=32**

° **1) The RAM will have 25 address lines and 5 data lines.**

° **2) The RAM will have 25 address lines and 32 data lines.**

° **3) The RAM will have 2^{25} address lines and 5 data lines.**

° **4) The RAM will have 2^{25} address lines and 32 data lines.**

° **Perform the following two's complement additions and indicate which additions result in overflow.**

° **I)   0 1 1 0   II)   0 1 1 0**

° **   + 1 0 1 0   + 0 1 0 1**

°

° **1) I only**

° **2) II only**

° **3) I and II**

° **4) none**

° **Which statement about why we use two's complement numbers is true?**

° **a) Two's complement makes all arithmetic operations easier.**

° **b) Two's complement allows us to represent more numbers.**

° **c) Two's complement is the only way to represent negative numbers.**

° **d) Subtraction circuits are not needed in two's complement.**

Peer Instruction Example

What is the total resistance of the circuit when the switch is closed?

a. 50.
b. 10.
c. 8.
d. 0.
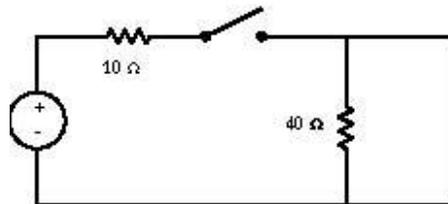
Few Slides on INNOVATIVE TEACHING METHODS

Slide 1: Innovative Methods of Teaching

Slide 2: Innovative Methods of Teaching
We think of the effective teachers we have had over the years with a sense of recognition, but those who have touched our humanity we remember with a deep sense of gratitude.

Slide 3: CHANGE one THING — To Change Effectively, Change Just One Thing

Slide 4: Ask yourself please
1. Teachers often continuously talk for an hour without knowing students response and feedback.
2. The material presented is only based on lecturer notes and textbooks.
3. Teaching and learning are concentrated on "plug and play" method rather than practical aspects.
4. The handwriting of the lecturer decides the fate of the subject.
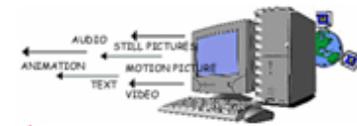
Slide 4 (second): Ask yourself please
1. Teachers often continuously talk for an hour without knowing students response and feedback.
2. The material presented is only based on lecturer notes and textbooks.
3. Teaching and learning are concentrated on "plug and play" method rather than practical aspects.
4. The handwriting of the lecturer decides the fate of the subject.

Slide 5: Ask yourself please
5. There is insufficient interaction with students in classroom.
6. More emphasis has been given on theory without any practical and real life time situations.
7. Learning from memorization but not understanding.
8. Marks rather than outcome oriented.

Slide 6: MULTIMEDIA LEARNING PROCESS
AUDIO, STILL PICTURE, ANIMATION, MOTION PICTURE, TEXT, VIDEO
✓ Make them more motivated.
✓ To pay more attention to the information presented.
✓ Retain the information better.

Slide 13: Peer Instruction
Eric Mazur is a physicist and educator at Harvard University, and an entrepreneur in technology start-ups for the educational and military markets.

Slide 14:
- Peer Instruction - involves students in their own learning during lecture and focuses their attention on underlying concepts.
- Lectures are interspersed with ConcepTests, designed to expose common difficulties in understanding the material.

Slide 15:
A small car collides head-on with a massive truck.
➤ Which vehicle experiences the greater magnitude force during the collision?
1. The car.
2. The truck.
3. The answer depends on the speeds the vehicles were moving.
4. Both experience the same force during the collision.