Making a last lecture Energetic in a day with active and collaborative learning

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Abstract:
Last lecture delivery in a day is very challenging in all education systems. Lecture management involves lecture planning, learning objectives, teaching methods and classroom engagement. Lecture management is two_way communications between teacher and students. This paper deals by making a last lecture in a day energetic, "an experience in engineering institute. This paper shares an experience, to make the classroom teaching active and collaborative learning. The paper focused on outcome based education system for lecture management through students' involvement by active and collaborative learning methods.

Key Words: energetic, collaborative, learning, lecture.

1. Introduction:

Nowadays each education system focuses on outcome based education system. Engineering education is mostly focused on outcome based education system. Teacher in the engineering education system trying different ways to meet the outcome based education system. Outcome based education system mainly focused on students i.e. what teachers are teaching are the students learning? To achieve outcome based education system lot of modern teaching methods and teaching aids developed. Every teacher uses different modern teaching methods as well as teaching aids. The teaching methods include lots of different learning activities to make the classroom more effective and students' participation. Some activities are role play, think-share-pair, group discussion, presentation, animated video clips, analogy and demonstration, think-pair-share, problem based learning(PBL), case studies, jigsaw, student team achievement division(STAD), Fish bowl, etc. Lot of active and collaborative activities used in outcome based education system. The classroom management is very important for teaching, learning methodologies for two-way communication of student and teachers.
If the lecture is last lecture in a day, it is very challenging for the teacher. In last lecture the teacher first role is to make the class energetic for active learning.

2. Why to make last lecture energetic?

Last three-year survey shows that the learning interest of students varies with time, place, course, contents and duration. Normally the engineering lecture hour is 60 minutes. But all 60 minutes effective learning of the students' is very difficult. The learning ability of the students varies with students e.g. IIT's and NIT's students, government college students, Deemed University students, private institutes' students and autonomous institute students. Individual student likes different classroom learning methods and styles. Some students like black board presentation, some concentrate on PPT presentation, few students like animated video clips and some students learn from real demonstration in the lecture, etc. Some learn by active involvement of them. Lot of reasons are present in the students learning abilities and interest.

The survey shows that first lecture of every day the students' concentration is up to 30 minutes and for second lecture is it is up to 25 minutes, after Lunch break third lecture students' concentration is up to 20 minutes. For fourth and fifth lecture it remains up to 15 minutes. At the last lecture the students' concentration is only 10 minutes. Last lecture management very challenging for teachers. The Timings and teaching strategy changed with respect to the lecture number i.e. whether the lecture

is at morning session, after lunch or evening session. Teaching Learning responsibilities handled by engineering faculty with different methods. There is major need of balancing between students' learning concentration and teaching learning methods followed by teachers.

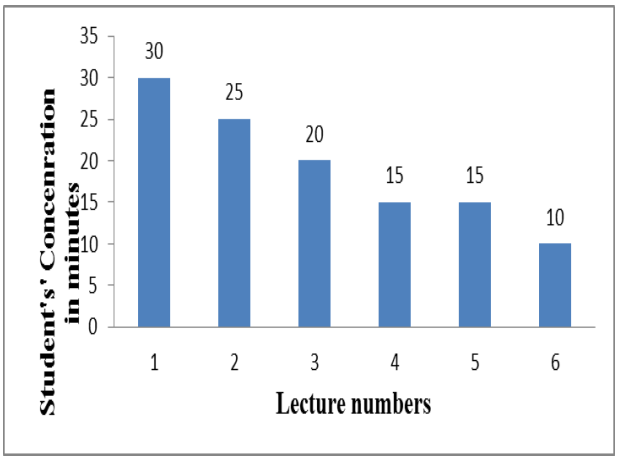

Fig. 1.Students concentrations per lecture in a day

The one more survey indicates that students' concentration is different for different teaching aids. The students' interested learning types accepted by engineering students are given below.

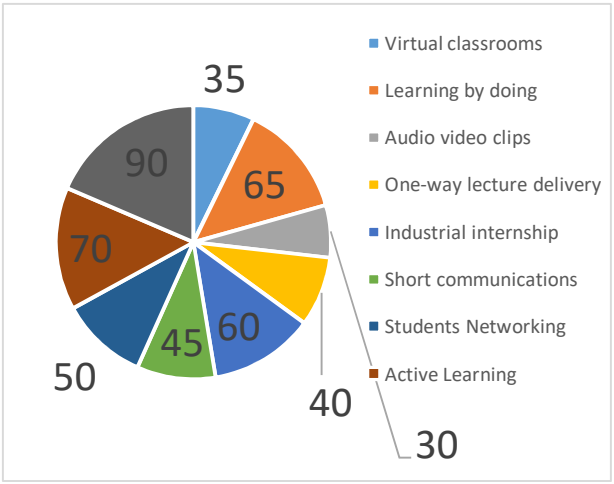

Fig. 2.Students interests for different learning styles

3. Energetic Lecture Management:

Energetic lecture management is nothing but use of proper teaching methods for students learning outcomes and to assess the students' progress to accomplishing the learning outcomes. The concepts taught in lectures, close to the textbook or reference books. The Energetic lecture management includes multiple learning objectives spread based on the levels of Bloom's taxonomy. Teacher need to align the subjects teaching methods in such a way as to endorse the plan truly being practiced. Energetic lecture management focuses the effective time management and activities of lecture and achieving the lecture outcomes as well as course outcomes. The Energetic lecture management helps to meet the course outcomes. Teachers practice power point presentation, black board, demonstration, video clips, animated video clips and real example with oral explanation, etc. teacher uses role_play, think-share-pair, group discussion, presentation, animated video clips, analogy and demonstration, think-pair-share, problem based learning(PBL), case studies, jigsaw, student team achievement division(STAD), Fish bowl active and collaborative learning methods. Energetic lecture management adopted is active and collaborative learning methods. Feedback from students after implementing such type of classroom teaching is given below.

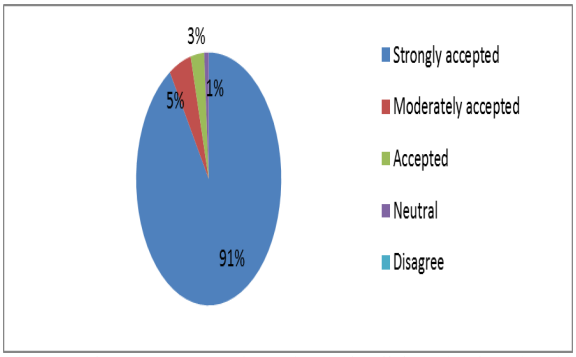

Fig. 3.Students acceptance for active and collaborative learning for last lecture in a day

4. Active and Collaborative Methods :

Active learning methods must as short as possible. The activity must encourage the students to help energetic. The activity must support the topic learning outcomes of the course. Use different active learning styles for different class and courses. Provides students with an opportunity to involve in learning the topic. Promote students to exercise such as active and collaborative learning through team, pair and expert group with different students. This practice increases the student-student interaction as well as teacher-student interaction. It removes the fear in student about teacher. It increases the helping nature among students as well as self-confidence of students. Previous preparation of class is very important. Provide students to resource material. Address the learning goals in a class will help students as well as teacher. Establish rules and encourage the all students to take part. Teacher must introduce the activity and learning to help. Teacher

must control the time cost given to students. Start small activity. Which learning activity suits, to which course topic must analyzed before lectures? Each activity will not suit to each course or topic? Facilitate the students' step by step, if any student is not participating encourage them. If you want use icebreaker you can use. Some of the active and collaborative learning methods implemented are given below.

1. Think-share-pair: Students think the answer of question and share their answers with their neighbor and again after discussion the neighbor they share their views with other pair of students.
2. Role Play: This is an effective method. Block diagram must be explain through this method. Systematic flow concept must be examin by role play. Students performs the role and gets better idea of theories and concepts of that topic. Example of role play is to understand simplex, duplex and half duplex in communication. For this two students will play this role, one will narrate.
3. Small Case studies: Some small real problems will be given to students and ask them to analyze it. E.g. I wireless sensor network and IoT lecture the case study is use of IoT and WSN.
   In canteen: How many sensor networks will require? Which sensors and actuators will require? How the canteen become the smart canteen, etc.
4. Simulation: some topics is cleared through simulation. E.g. in WSN how the packets' transmission and reception takes place? Which parameters affects them? How they affect them? This explained by using Qual Net Simulator and students will test them, but it requires the PC or Laptop, or in a laboratory.
5. Problem based learning: students are given a problem and told them in a team to come with that solution. One example is if you want to make the classroom smart classroom what changes are necessary.
6. Peer review: students review the material written by their classmate and write comments on them. After these students will clarify their answers and understand the learning ability of their classmates.

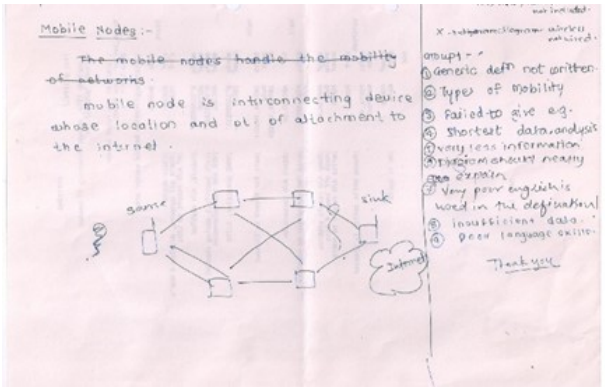

Fig. 4.Sample of peer review

7. Discussion and presentation: Students will discuss about one topic which is given by teacher and collaboratively come up for presentation of that topic. Same topic is given to all the groups. E.g. in research methodology types of research with examples.

Fig. 5.Discussion in classroom

Fig. 6.Discussion in classroom

8. Game: This is effective but takes lot of time. Prep reparation is necessary for this. If you want to understand the broadcast and multicast you can play the game by using balls.

9.Jig-saw: Make the students into teams having four members in a team. Name the team members as 1, 2, 3, and 4. Each 1 from all teams will combine and study ¼ of topic. Each 2 from all groups will work on next ¼ of topic. Every 3 from all groups will work on next ¼ of topic. Repectivelly 4 from all groups will work on next ¼ of topic. Finally, all 1, 2, 3, 4 will go back and merge their teams. Once again they combine their knowledge and clear their droughts. E.g. scientific method.

10.Mini STAD (Student team achievement development):

First teach for 10 minutes. Then take the quiz using clicker. Give the students to discuss in the team of four members. The last 10 minutes again take the quiz. We will find the results are improved and students clear the details of that topic.

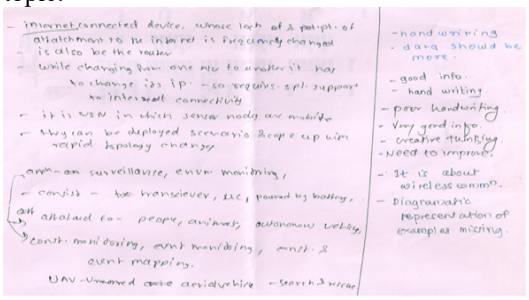

Fig. 7.Sample of peer review

11.Question and answer with self evaluation: This is very simplest way. Ask the question to students. Tell them to write the answers. Show the answers to students and tell them do self evaluation. E.g. see the following chits.

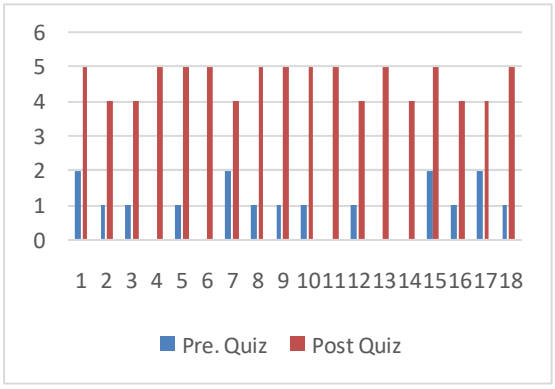

Fig. 8.Prequiz and post quiz analysis

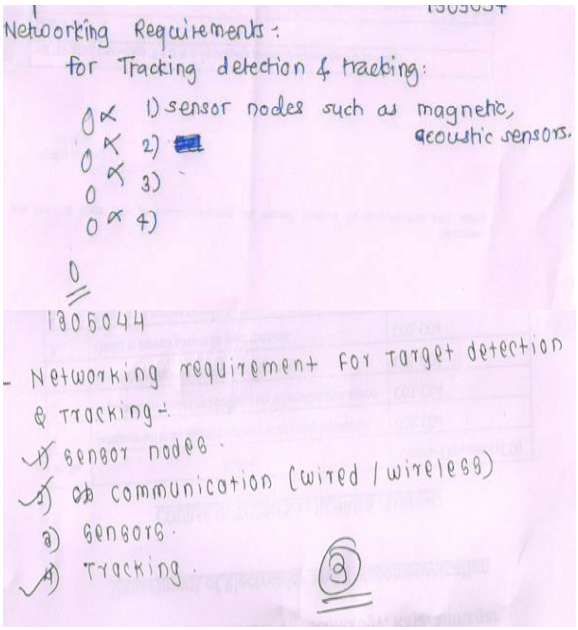

Fig. 9.Sample of Q and A with self evaluation

12: Mini sheet Presentation: Students will arrange the concepts relate to learned information. One example is shown below.

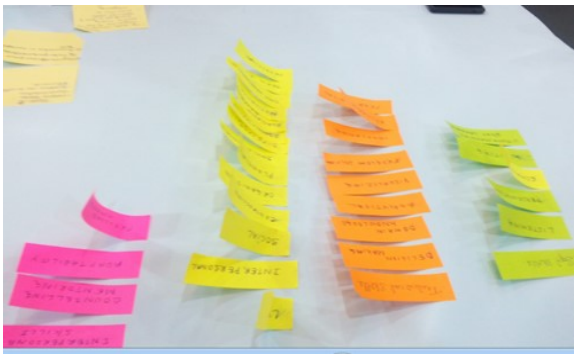

Fig. 8.Sample of mini Presentation

3.Conclusion:

Energetic lecture management, an experience in engineering teaching helps students meet their learning outcomes. This method helps to meet the course outcomes as well as program outcomes of the deparment. This method provided through the active and collaborative teaching method. This method assists the teacher to support for effective classroom teaching for last lecture in a day. This method helps teachers for implementation of outcome based education system very successfully.