Improvising Teaching Methodologyfor Large Class using Technology

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Abstract - Rapid developments in invented technologies led educational institutions to effectively integrate it into the teaching-learning processes. The main problem addressed in the paper is dealing with uninterested and unmotivated studentsand Teaching-as-Research. Another problem addressed is Appropriate Assessment and feedback. Thus, this paper tries to explore to what extentTeaching can be improved for large class, perceivedcomputer competencies, attitudes toward computers and technology vision. The findings of the study showed that teaching and learning were constrained by large classes. The paper argues, however, that the immediate solution may not be class size reduction. Such approach as enabling teachers to develop the confidence and skills to improve the learning environment in large classes should be explored as alternatives to class size reduction. Finally, the importance of presenting research findings,for large class to improve the quality of teaching and learning in Engineering College is discussed.

Keywords:Effective Teaching,Assessment, Computer Competencies, Team teaching; Co-teaching; Cooperative teaching.

I. INTRODUCTION

Engineering and science are traditionally taught deductively. The instructor introduces a topic by lecturing on general principles, then uses the principles to derive mathematical models, shows illustrative applications of the models, gives students practice in similar derivations and applications in homework, and finally tests their ability to do the same sorts of things on exams. Little or no attention is initially paid to the question of *why* any of that is being done—what real world phenomena can the models explain, what practical problems can they be used to solve, and why the students should care about any of it. The only motivation to learn that students get—if they get any at all—is suggestions that the material will be important later in the curriculum or in their careers. Simply telling students that they will need certain knowledge and skills some day is not a particularly effective motivator.

According to the literature reviewed, three main principles of effective teaching could be identified. The first is ***dealing with students' existing ideas andconceptions***. This requires teachers to be aware of their ideas and in the light of scientifically accepted knowledge; modify, change or develop them further to encourage students to apply new concepts or skills intodifferent areas. This principle would help Teachers in **Teaching-as-Research**, which is required to develop and implement teaching practices that advance the learning experiences and outcomes of students. The second principle identified is ***encouraging student participation in lessons***. The above principles will help in overcoming the problem of **uninterested and unmotivated students** addressed in the paper. "When our interest is aroused in something, whether it is an academic subject or a hobby, we enjoy working hard at it. Along with the need to establish the relevance of content, instructors need to craft explanations that enable students to understand the material. This involves knowing what students understand and then forging connections between what is known and what is new. This would help in delivering quality and value to a **large class** with a unique challenge in teaching learning method.

The Third principle identified is ***offering continuous assessment and providing feedback*.** This principle involves using a variety of assessment techniques and allowing students to demonstrate their mastery of the material in different ways. It avoids those assessment methods that encourage students to memorize and regurgitate. It recognizes the power of feedback to motivate more effort to learn.

II. LITERATURE ON EFFECTIVE TEACHING

There is vast literature on issues related to the teaching with Technology in large classes. This review concentrates on the challenges to the teaching and learning in large classes; Methods to improve Effective Teaching and gaps in previous studies that the current research seeks to fill.

A. Challenges in Effective Teaching

Some literature have indicated that there are challenges to teaching and learning in large classes both to the teachers and to students that includes limited class time. In addition, hesitation to ask questions, minimum access to materials, and the need for individual effort challenge the students. There were several challenges for teachers on how to promote attendance in large classes, to take roll-call, to minimize the sense of anonymity in large classes. In addition, approaches to assess students, to improve lessons, to use technology, and to address learning activities. There is no single way to teach large classes, but, one has to consider three things: (1) ones' teaching style; (2) the characteristics of the students; and (3) the goals and the objectives of the course.

We all must have realized that a lesson presented to 20 students is probably not much different from a lesson presented to 100 students. However, the teachers should focus on three broad areas of attention in the teaching of large classes that include: (a) creating a small class atmosphere in a large-class setting; (b) encouraging class participation; and (c) promoting active learning, with associated activities, as outlined in Table 1.

Teaching Goal	Suggested Activities
– Creating small class environment in large class Setting	– Learn Student names – Move around the classroom – Elicit students' Feedback – Freely interact with Students
– Encouraging Class Participation	– Divide class into small groups – Enhance students' Self belief – Plan participation
– Promoting Active Learning	– Show your own Enthusiasm for the subject – Give a "Think Break" – Clear the lesson Outline & objective before topic is initiated
– Improving Student Attendance	– Give unannounced quizzes – Provide handouts in class

Table 1: Teaching Goal and Suggested Activities

B. Methods to improve Effective Teaching

As any experienced teacher knows, "one size fits all" does not apply to instructional programs. *Faculty Focus* is a resource for developing effective teaching strategies, instruction and curricula.

1. Humor in the Classroom

Humor in educational settings serves a variety of positive functions beyond simply making people laugh. Humor builds group (as in class) cohesion. People respond more positively to each other when humor is present. It brings them together. Humor can facilitate cohesion by softening criticism. Research also establishes that humor helps individuals cope with stress. It relaxes them. But not all the functions of humor are positive. If humor is used divisively or to disparage others, it weakens group cohesion. Humor has negative impacts when it is used as a means of control. For example, given the power dynamic in the classroom, it is highly inappropriate for instructors to target students by making fun of their ignorance or beliefs.

2. *Cooperative or Group Learning*

Research shows that organizing students into cooperative groups yields a positive effect on overall learning. When applying this strategy, keep groups small. In the typical college classroom a small handful of students make the vast majority of comments. As a teacher you want to create a classroom environment that helps students of various learning styles and personalities to feel comfortable enough to contribute as well as understand the importance of class preparation and active participation. To reach this goal requires a constant balancing act of encouraging quiet, reflective students to speak up and, occasionally, asking the most active contributors to hold back from commenting in order to give others a chance.

3. Setting Objectives and Providing Feedback

Setting objectives can provide students with a direction for their learning. Goals should not be too specific; they should be easily adaptable to students' own objectives. A good foundation for interactive conversation is a relaxed

atmosphere and an understanding by students that their ideas and opinions are important and will be accepted and entertained. Students must feel that their comments are going to be listened to and sincerely responded to. Establishing student trust and acceptance is an important aspect of their participation.

4. *Testing Hypotheses:* Quiz, Questioning, and Orals

Quiz, questions, and Orals help students use what they already know about a topic to enhance further learning. Research shows that this should focus on what is important, and are most effective when presented before a learning experience. The main objective of these quizzes is to encourage students to prepare for each class so they have a basic understanding of the current terms and concepts. Make it clear that the quizzes can't be made up later by absent students; this would help in improving student attendance.

C. *Strengths and gaps in prior research in Effective Teaching*

To improve Effective Teaching some of the teaching models developed as of are 'the learning cycle' [15], 'co-operative learning' [12], 'the 5E instructional model' [6], 'the conceptual change model' [14], 'the generative learning model' [8] and 'information-processing teaching models' [7].

Focusing student attention on the material to be learned is an important factor in effective learning [8]. There is a school of thought which proposes that teaching materials should match individual learning styles, i.e. visual, auditory and kinesthetic[7]. The use of visual teaching aids can provide more concrete meaning to words. For example, working models help students make sense of the world by finding out the why of things and make abstract or imagined concepts seem more real to students [10].

Effective teaching requires teachers to check continuously the development of students' understanding and give detailed positive feedback in order to make sure that students correctly integrate new knowledge into the existing knowledge structure [11]. In addition, in order to identify and correct students' mistakes at an early stage before they become too deeply embedded, teachers need to continuously monitor and evaluate students' understanding [13].

III. METHODOLOGY

In response to the challenges highlighted above, methodology has been developed to cope with the large classes and to conduct lectures effectively with technology. This survey focuses broadly on two questions: What do we want the students to learn? How Effective Teaching with Technology for large class different from ordinary teaching strategies? The main goal of the paper is developing teachers' technological skills and their capacity to integrate technology into the curriculum.

Effective Teaching with Technology focuses on development of operational experiences, and student outcomes and effectiveness of the Teaching-as-Research approach to motivate future graduate students to view teaching and the classroom with the same critical eye and scientific method that they use in their own research. More group activities should be conducted and should be judged to cover large crowd. Students Opinion about how a particular topic should be taken and what all things should be covered should be taken from them. This would help us to know students expectation from a course and thus we would be able to set the students objective and through their feedback we can come to know whether course objective set by students has been achieved or not.

Effective Teaching with Technology (ETT) is a way by which teacher will explain all the essential technological Concepts and tool to be used in the coursefor the same subject to two set of classes. Teaching a large crowd issue can be overcome by dividing the crowd into teams or groups this would be implemented for one class. This would help in team building and students taking initiative to participate. Teacher will follow the old teaching technique for otherset of class. Setting Objectives before the session starts can help to overcome the issue of student's expectation from a particular topic which would be taken from both the classes. Also feedback session or exams can help to know whether student's expectations are met or not.

A. *Research Design*

Two sets of classes where students Pre objective has to match with student's feedback after session. Research Design is for multiple students from two different classes enrolled for same subject. ETT (Effective Teaching with Technology) is applied only on one class to compare the difference with other class where teacher follows the old teaching technique. At last, results of two classes are compared to check whether ETT was successful or not. If class with ETT has good average score as compared to class with Traditional technique then ETT is successful.

B. *Research Sample*

Our sample will be Computer Engineering Students learning same set of technology. All computer background engineering students find it difficult to relate a theoretical concept into projects. Using ETT we set their objective

and focus on implementation of technology in groups to cover large crowd. And through this strategy we can also check if student's objectives are met or not. Research studies show that the most effective groups tend to be heterogeneous in ability and homogeneous in interests. One approach to team formation is to use completely random assignment to form practice teams, and then after the first class examination has been given, form new teams using the given guidelines.

C. Procedure

Most students cannot stay focused throughout a lecture. After about 10 minutes their attention begins to drift, first for brief moments and then for longer intervals, and by the end of the lecture they are taking in very little and retaining less. A research study showed that immediately after lecture students recalled 70% of the information presented in the first ten minutes and only 20% of that from the last ten minutes [16].

Students' attention can be maintained throughout a class session by periodically giving them something to do. Many different activities can serve this purpose [9], of which the most common is the small-group exercise. At some point during a class period, the instructor tells the students to get into groups of two or three and arbitrarily designates a recorder (the second student from the left, any student who has not yet been a recorder that week). When the groups are in place, the instructor asks a question or poses a short problem and instructs the groups to come up with a response, telling them that only the recorder is allowed to write but any team member may be called on to give the response. After a suitable period has elapsed (which may be as short as 30 seconds or as long as 5 minutes—shorter is generally better), the instructor randomly calls on one or more students or teams to present their solutions. Calling on students rather than asking for volunteers is essential. If the students know that someone else will eventually supply the answer, many will not even bother to think about the question. Such learning exercises may address a variety of objectives. Some examples follow.

- **Recalling prior material-**The students may be given one minute to list as many points as they can recall about the previous lecture or about a specific topic covered in an assigned reading.
- **Responding to questions**- Any questions an instructor would normally ask in class can be directed to groups. In most classes—especially large ones—very few students are willing to volunteer answers to questions, even if they know the answers. When the questions are directed to small groups, most students will attempt to come up with answers and the instructor will get as many responses as he or she wants.
- **Problem solving**- A large problem can always be broken into a series of steps, such as paraphrasing the problem statement, sketching a schematic or flow chart, predicting a solution, writing the relevant equations, solving them or outlining a solution procedure, and checking and/or interpreting the solution. When working through a problem in class, the instructor may complete some steps and ask the student groups to attempt others. The groups should generally be given enough time to think about what they have been asked to do and begin formulating a response but not necessarily enough to reach closure.
- **Analytical, critical, and creative thinking**- The students may be asked to list assumptions, problems, errors, or ethical dilemmas in a case study or design; explain a technical concept in jargon-free terms; find the logical flaw in an argument; predict the outcome of an experiment or explain an observed outcome in terms of course concepts; or choose from among alternative answers or designs or models or strategies and justify the choice made. The more practice and feedback the students get in the types of thinking the instructor wants them to master, the more likely they are to develop the requisite skills.
- **Generating questions and summarizing**- The students may be given a minute to come up with two good questions about the preceding lecture segment or to summarize the major points in the lecture just concluded.

D. Instruments / Tools

The first rule of a presentation is to understand the type of students; the idea was to deliver a message to the students based upon what they need to hear and their level of understanding. In today's classroom learning environment, I think we should consider the type of students is, but just as important, HOW to best deliver the learning materials.

Here are 7 technology tools that should be standard technology in the classroom:

1) **Secure Wireless Networks**- Moodle, Blackboard, Wiki and other learning applications are primarily Web based learning tools. Students should be able to access the learning applications from any type of mobile device (iPods, iPads, tablet PC's, etc.). Web content filtering and application level control should be built in. The system should support student or teacher owned mobile devices as well as school owned assets.

2) **Video Conferencing/ Telepresence**- Taking students to NASA used to be challenging, not with a video conferencing system. Did you know that there are more than 1,000 channels or organizations that will allow you to connect to them via video conference? Get a group of middle school students on a video call with an astronaut and you can hear a pin drop in the room when the astronaut speaks.

3) **Interactive Smart Boards**- Smart boards have web access built in and many run interactive software that enhances the materials in each class. Save the content and you can email the learning session with notes to the students or make them available online.

4) **Video Streaming/ Web Conferencing**- Students watch more YouTube than cable TV. Creating and uploading videos to YouTube is very simple and can be done with an inexpensive Webcam. Add simple web conferencing software and you can tie in a remote teaching source as well.

5) **Multimedia Sound and Video**- Audio visual installation in the classroom should include the ability to project video and listen to audio from multiple sources (PC, Smart Board, Document Camera, etc.).

6) **Document Camera Scanner-** Also known as a "Visual Presenter" this is simply a camera that has the ability to project whatever is on a desk (a document or science fair project for example) to video system. We recommend using a network based document camera that works with a PC and software vs. the traditional stand-alone cameras with limited classroom integration.

7) **Lecture Capture Software**- "Distance Learning" and online courses is probably the fastest growing segment of the education sector. But the concepts can be used even by traditional schools. Students can only retain a limited amount of information inside the classroom no matter how good the instructor is. Why not make the content available online for the students to review and study from home?

These tools make learning interactive and more closely match what the students are used to away from school. In my opinion, they should be on every educational technology road map.

IV. RESULTS

In order to assess whether this overall effect stems from an exposition of a student with ateacher it has been tested on two different classes for the same subject by the same teacher. The research findings showed that the average final exam scores of students of one class receiving team teaching with technology were higher than those of students receiving traditional teaching. The two teaching methods showedsignificant difference in respect of students' achievement. More than half of the experimentalstudents preferred team teaching to traditional teaching.

V. CONCLUSION

"All of the top achievers I know are life-long learners... looking for new skills, insights, and ideas. If they're not learning, they're not growing... not moving toward excellence" by (Denis Waitley).The results of this study suggest that students are using technological tools in their daily lives for many purposes, especially for their education. It is also seen that using educational technology tools will help both to the students and to the teachers to be more successful, efficient and practical people in their lives.Since the research concentrated on a single subject, the implementation of team teaching in the field of interdisciplinary courses is needed. The key to this lies with teachers, who are required to do this actively; otherwise, educational reform will not achieve its goals.

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