

Model Based Learning for Effective Teaching Methodology

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Abstract: *Today a big challenge to introduce a new topic during the classroom teaching. As new technologies and new concepts are out of imagination Engineering concepts and machineries are difficult to experience and imagine in the classroom directly. We complete our teaching process but still there is doubt in the mind of the students. AS the lecture over hardly one or two students in the class may come for clearing the doubts, others those who have even doubt in their mind do not come for solving after the lecture. Finally, the candidate will come out with incomplete knowledge and will not be Industry Ready Engineer. To overcome this at some level we may adapt few techniques while teaching or delivering any Engineering concept, Machineries information, Industry layout. This paper involves some effective teaching methodology which we can adopt while teaching in the classroom, so that the concept of Engineering can be cleared to the students and can get complete knowledge.*

Keywords: Teaching Methodology, new concepts, Industry ready

I. INTRODUCTION

Reading book and explaining the concept

Mostly few times some will follow this traditional method, where either teacher or a student read the book. A line or a paragraph will be read by the teacher and then he/she will explain the concept. This is one-way method. After the completion of topic, questions will be asked to the students or sometimes detection of question and answer after the completion of topic. This method is somewhat effective where there are less diagrams and less imagination required.

Use of Chalk and Board

Chalk and Board is a conventional method which is most effective for few courses which are figure and analytical based.

But by properly using the area of black or green board we can use this method to understand numerical to the students. For theory concepts this media of teaching is not effective. Which is only suitable to draw and explain the diagrams as well as good for analytical concept solving. It is more time consuming. But now a day's time available is less and the concepts are more. Also it is difficult to draw complicated diagrams on the board. Even while drawing the diagrams only the lecture will be over and topic incomplete.

Now a day's white boards are used which are dustless. But not suitable for explaining the concept of Engineering drawing where blackboard can be used effectively to differentiate between different types of lines.

Conventional teaching methods used in the educational institutions have many advantages. These advantages can also be seen as disadvantages of modern teaching methods-

Conventional teaching method is cheaper than the modern teaching methods which make it more suitable in the schools of rural areas.

Some subjects like mathematics or chemistry are best taught on a blackboard as there is a need of explaining the concept at each every step.

There is more interaction between the teacher and student in traditional teaching methods as compared to the modern teaching methods. We can also say that in traditional teaching there is more discipline in the class.

In traditional teaching methods teacher does not require any special technical knowledge and can focus more on his subject for imparting the best knowledge to the students.

II. LITERATURE REVIEW

Technology-Enhanced Learning and Teaching Methodologies through Audiovisual Media

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Contemporary rapid advancements in science and technology have brought about and continue to convey change in all sectors of everyday life. Education as one of the institutions of utmost importance is directly and indirectly affected by these changes and needs to redefine its role to keep pace. Nowadays, information and communications technologies (ICTs), in which audiovisual media technologies are encompassed, are omnipresent in all educational levels and disciplines, including media studies. New approaches in traditional teaching methodologies, which demand many skills and abilities by the educators, are reformulated through utilization of audiovisual media technologies, aiming at administering enriched outcomes that support the objectives that are set, especially in the field of media studies, where audiovisual media technologies are an integral part and even inherent in many of the courses (journalism, radio, television, social media, public relations, communication). The purpose of this paper is to summarize, through a theory and bibliographic review, the various implementations of audiovisual media as the educational techniques and tools that will provide technology-enhanced learning. As this paper is an investigation of the effects of audiovisual media in technology-enhanced learning and teaching methodologies, the contribution to the discipline of media studies is straightforward.

Performance and Perception in the Flipped Learning Model: An Initial Approach to Evaluate the Effectiveness of a New Teaching Methodology in a General Science Classroom

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This study was conducted in a general science course, sophomore of the Primary Education bachelor degree in the Training Teaching School of the University of Extremadura (Spain) during the course 2014/2015. In order to assess the suitability of the proposed methodology, the class was divided in two groups. For the first group, a traditional methodology was followed, and it was used as control. On the other hand, the “flipped classroom” methodology was used in the second group, where the students were given diverse materials, such as video lessons and reading materials, before the class to be revised at home by them. Online questionnaires were as well provided to assess the progress of the students before the class. Finally, the results were compared in terms of students’ achievements and a post-task survey was also conducted to know the students’ perceptions. A statistically significant difference was found on all assessments with the flipped class students performing higher on average. In addition, most students had a favorable perception about the flipped classroom noting the ability to pause, rewind and review lectures, as well as increased individualized learning and increased teacher availability.

Preparing Students for Lifelong Learning: A Review of Instructional Features and Teaching Methodologies

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Lifelong learning is intentional learning that people engage in throughout their lives for personal and professional fulfillment and to improve the quality of their lives. In today's climate of continual change and innovation, lifelong learning is a critical educational goal. In order to prepare people for lifelong learning, educational opportunities must develop their capacity for self-direction, metacognitive awareness, and disposition toward lifelong learning. Several instructional features facilitate the development of metacognitive and self-directed learning skills, and the disposition to lifelong learning: (1) student autonomy, responsibility, and intentionality; (2) intrinsically motivating learning activities; (3) enculturation; (4) discourse and collaboration among learners; and (5) reflection. This article describes and presents examples of how three teaching methodologies—problem-based learning, intentional learning environments, and cognitive apprenticeship—employ these instructional features.

Modern Teaching Techniques for Engineering Concepts,

After covid situation use of hi-techequipment's in the educational institutions increased with rapid rate. There are lot of new techniques used for improving the teaching technique.

Use of computers or laptops with wi-fi connection in the classroom- This is the most important tool of modern teaching methods. Teacher demonstrates the subject on his laptop/computer which is connected to the laptops/computers of the students through wi-fi connection. This type of teaching is seen mostly in the higher education institutions which have good infrastructure.

Use of LCD projector in the classroom- Use of LCD screens in the educational institutions is becoming very common nowadays. Teacher prepares the power point slides and which are displayed on the LCD screen with the help of a projector. The projector can also be connected to a laptop/computer for displaying the relevant videos of the subject on the projector.

Use of interactive whiteboards in the classroom- Whiteboards are very interactive and provides the touch control of the computer applications. On whiteboard a teacher or student can draw, write or manipulate images so providing a very interactive and interesting platform.

Use of digital games in the classroom

Use of special websites or blogs for teaching in the classrooms

Use of microphones for delivering the lecture in the classroom

Merits of modern teaching methods-

Modern teaching methods have various advantages over traditional teaching methods. These merits can also be viewed as disadvantages of traditional teaching methods-

Modern teaching methods create more interest among the students with the help of interesting animations and videos. Research has shown that use of visual media for teaching helps the students to understand the subject better and also helps students to memories the concept for longer time.

With the help of modern teaching methods teacher can cover more syllabus in lesser time as they don't have to waste their time in writing on the blackboard.

Videos and animations used in the modern teaching methods are more explanatory than the traditional blackboard methods.

“Flipped classroom”

“Flipped classroom” teaching methodology is a type of blended learning in which the traditional class setting is inverted. Lecture is shifted outside of class, while the classroom time is employed to solve problems or doing practical works through the discussion/peer collaboration of students and instructors. This relatively new instructional methodology claims that flipping your classroom engages more effectively students with the learning process, achieving better teaching results. Thus, this research aimed to evaluate the effects of the flipped classroom on the students’ performance and perception of this new methodology.

Collaboration of modern and traditional teaching techniques for effective teaching-

Till now we have studied that both modern and traditional teaching methods have their own pros and cons. So it will be beneficial for our education system to combine the **advantages of traditional and modern teaching methods** for effective teaching. Here main question arises that how we can combine both traditional and modern teaching methods for effective teaching? Let me explain this with following points-

Blackboard and LCD projectors can be used simultaneously in a classroom; for teaching complex mathematical equations teacher can use blackboard while theoretical subjects can be taught on a LCD projector with the help of slides.

Practical subjects of basic sciences and engineering can also be taught best with the help of combination of both traditional and modern teaching methods. Teacher can explain the theory on a blackboard and for better understanding of the procedure of the experiment videos or animations can be used.

There is also another aspect through which we can combine both traditional and modern teaching methods for better teaching. Teachers can teach the subject first through traditional methods and then can take the help of modern teaching methods for revising the subject.

Model Based Teaching

Model based teaching is an effective technique where the conversion of motion can be easily identified.

Combination of Conventional and Modern Teaching Technique for effective learning

Case Study: -

For teaching the concept of single slider crank chain mechanism, we usually go through the conventional method like, drawing sketch on the blackboard and then explaining the sketch. This is somewhat difficult to understand the concept of conversion of rotary motion in to the sliding motion of the slider. In this case students are not more aware with the application where it is used? like used in the engine.

To understand this concept better way, you can use teaching media like computer and LCD projector where you can show the video of working of single slider crank chain mechanism and even you can use power point presentation to explain the concept to strengthen your teaching learning method.

Model based learning is one of the effective method where you can ask few students to prepare working model of the concept by using some wooden paper, cardboard, metal, thermocole material to prepare Model. input is given by using the electric motor. Model is prepared which shows the conversion of rotary motion in to the reciprocating motion. Now almost all doubts of the students will be cleared and concept can be understanding very easily by collaborating modern and conventional teaching techniques.

Following are the conventional and modern tools for Effective Teaching and Learning.



Wooden Model of Single Slider Crank Chain Mechanism

III. CONCLUSIONS AND DISCUSSION

The purpose of this paper was to focus on collaboration of conventional and modern teaching methods for effective teaching learning of the Engineering Concept. Also you can use model based learning by better understanding the concept as some concepts can not be cleared without preparation of models either working or stationary model. Also few concepts can be explained by directly using the actual object as it is said visualization will clear and remember all the concept instead of teaching only on the board. Thus collaboration of conventional, Modern and Model based learning will play an effective role in Teaching – Learning Process.

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