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Impact of teaching Electronics practical by E-learning based approach on Students

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Abstract: It's a known fact that teaching is a two way process i.e. the exchange of knowledge between a teacher and a student. In this changing world, technology is expanding at a very fast rate. From the world of landline phones we have shifted to android mobile phones. The world has seen advancement in technology by hundred folds in past 10 years. From just blackboard study, things have shifted to the online world, known as e-learning. This paper highlights the impact of teaching Electronics practical by E-learning based approach on undergraduate students. A batch of 50 students was selected. Videos and Animations were shown to the students based on various practicals which they perform in their laboratory. After that, students were asked to perform the same practicals in the laboratory and were asked to fill a feedback form, which had questions enquiring about their experience in performing experiments based on the approach of e-learning techniques. The results (feedback from students) obtained were analysed keeping in mind the various e-resources shown to them.

Key Words: Teaching, Knowledge, Technology, E-learning, Experiment, Impact, Student

I. INTRODUCTION

Technology helps to bring the structural changes that can be integral in achieving significant improvements in productivity. Technology supports both teaching and learning and thus infuses classrooms with various learning tools, such as computers and hand held devices and learning materials developed in form of animations, videos, manuals and presentations. Technology has made learning a very easy process which is available to the students at any point of time. It definitely builds students' skill, enhances students' involvement, motivates them and increases their learning capabilities. Being knowledge providers, it's our duty to make our students aware about various online resources so that they get thorough understanding of the particular subject taught to them. Technology also has the capacity to revolutionize teaching by building a new model which links teacher to the students in a very different manner. The online resources being developed [1] and studied are in form of modules including animations, videos and power point presentations of various devices used in electronics practical. The development of these online resources even places a challenge for the teacher as they need to rethink and fundamentally reconstruct the e-classes [2].

An experiment was conducted in a school to study the impact of innovative teaching and the result obtained concludes that e-resources have a positive impact on both individual and group. It satisfies the individual learning requirements and increases the interest level among the students and showed that at the group level, more students are found scoring higher grades [3]. Another advantage of innovative learning is that multi-media tutorials provide the students with the flexibility of time and platform to work on problems and examples [4]. These innovative methods of learning are very much appreciated by the students as they make the learning enjoyable. Thus, the paper gives a description of how multimedia applications have a positive effect on the learning process of students as compared to conventional teaching methods.

II. METHODOLOGY

The whole process of research was carried out in various steps to find how much students have acquainted the basic concepts of electronics practicals by e-learning approach. Various studies have shown that the average students who use technology for learning purposes scored around 66th percentile while average students without technology scored around 50th percentile [2]. The methodology followed was:

1. Selecting a particular group of 50 students.
2. They were shown various online resources developed in the form of videos and animations [1] related to the various electronics practicals performed in laboratory like Newton's rings, Semiconductor diode, CRO and DSO and many more.
3. After that the students were asked to perform the same practicals in the laboratory.
4. Then they were provided with a test related to the video and animation shown to them and also with a feedback form in a form of a questionnaire including various points like:

- Did they find any difference in learning between multimedia aids and classroom teaching?
- Were they able to concentrate more while watching the animation?
- Was it easy for them to gain the concept and retain it for longer duration?

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- Were they able to perform better in practical class after learning through e-resource?
- Do they prefer they should be shown such kind of videos and animations while teaching a particular topic?
- Did they enjoy learning?
- Would they like to develop such kind of resources by themselves?
- On a scale of 10, how much they will rate e-learning?

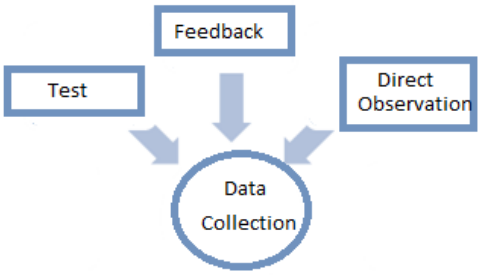

Fig 1 Methods of Data Collection

5. Then students' response was recorded and analyzed.

III. RESULT

The study showed that most of the students were very much satisfied with the e- learning based approach. As shown by graph 1- 90% of students easily understood the concept and enjoyed learning. They were very much interested in developing e-resources by themselves as that will help them to have a much better understanding of a particular topic. Even though, some of the students found it difficult to gain the concept by just watching the video and needed teacher's assistance as well but most of them found e-learning as a fruitful approach and wanted to go through the videos and animations first, before coming to the class.

The data collected from the feedback collected from the students is as follows:

1. 85% of the total students found a difference in learning between multimedia aids and classroom teaching. They found e-learning made them understand a concept in an efficient way as compared to conventional classroom methodologies.

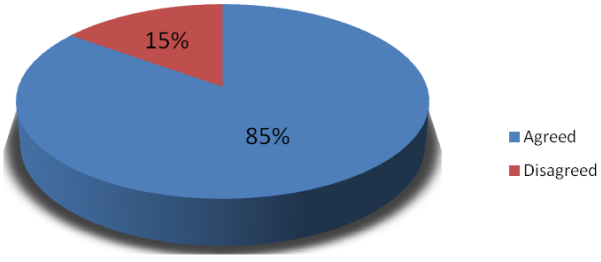

Fig 2.Number of students who said that they found some difference between multimedia aids and classroom learning

2. 91% of the total students were able to concentrate more while watching the animations. They said that they were much more attentive while watching those videos and animations as compared to traditional classroom study.

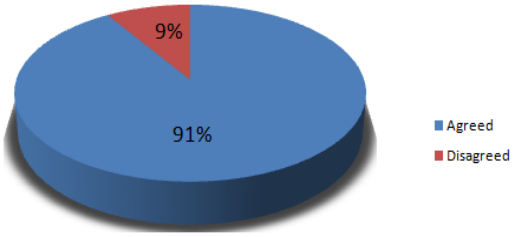

Fig 3.Number of students who were able to concentrate more while watching videos and animations

3. 94% of the students agreed that it was easy for them to gain the concept and retain it for longer duration by visual means rather than simply listening over the concepts in classroom teaching.

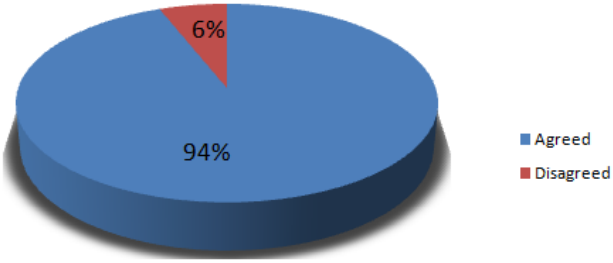

Fig 4.Number of students who found that they gained the concepts easily after watching multimedia aids

4. 82% of the students agreed that they were able to perform better in practical class after learning through e-resources as it provided them with a better grasping of key concepts in practicals.

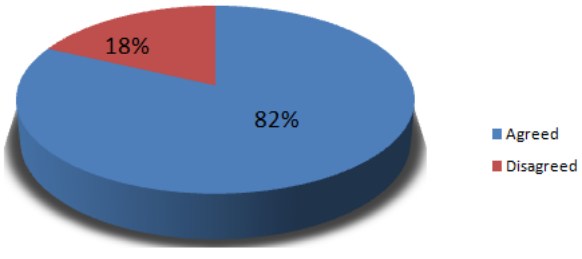

Fig 5.Number of students who found it easy to perform in practicals after learning through multimedia aids

5. 87% of them preferred that they want to watch such kind of videos before performing practicals in

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laboratory as they found them more convenient and time saving.

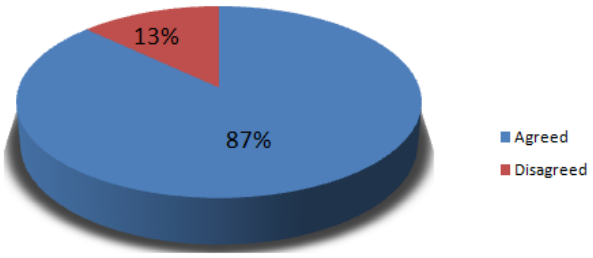

Fig 6. Number of students who preferred to watch the videos

6. 90% of them enjoyed learning by videos and animations as they found them more interesting and eye-catching.

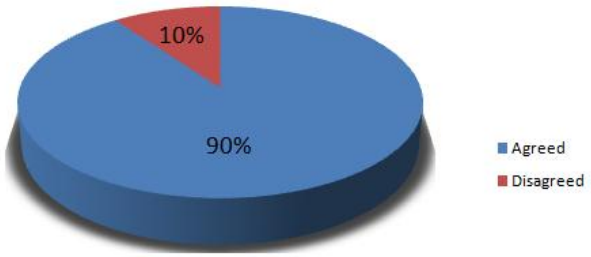

Fig 7.Number of students who enjoyed learning through innovative methods

7. 78% of the students agreed that they would like to develop such kind of resources by themselves as that will help them to understand the concepts of the particular subjects thoroughly.

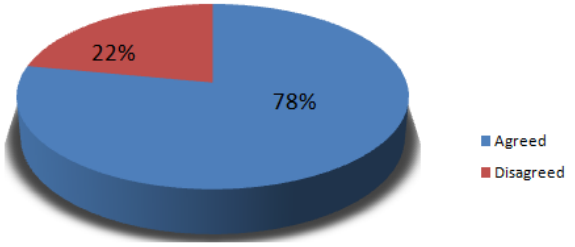

Fig 8.Number of students who want to develop multimedia aids by themselves

8. 86% of the students rated e-learning above 7 points as they found they will be able to perform much better in practicals and this method of learning will be beneficial to them.

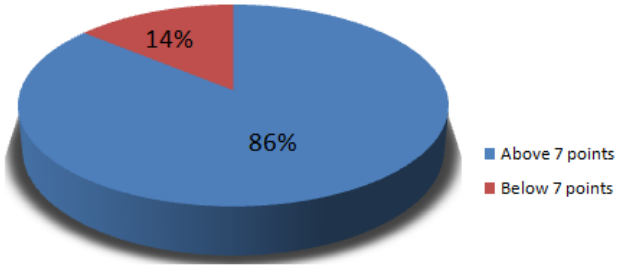

Fig 9.Number of students who gave e-learning methods more than 7 points

Even students performed better in the test which was based on the practicals they perform in laboratory. There were able to answer most of the conceptual and practical based questions.

IV. CONCLUSION

Every student has a different learning process and e-learning proves to be a fair approach for all the students belonging to different academic backgrounds. Students showed a very positive response towards this approach. They found it as an easy way of learning. They found that they were able to retain the concept learnt by e-learning for the longer duration. The ICT learning resulted in job creation, higher wages, and increased revenue generation opportunities for the local businesses involved for the students [5]. The study portrays that the using e-resources in classroom is beneficial for both teacher and student. It can definitely help in overall growth of India's education system.

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