

# Multimedia Courseware in Learning Biology Concepts among Student Teachers at Diploma Level: An Experiment

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**Abstract** – This study provides an effectiveness of multimedia courseware in learning biology concepts among student teachers at Diploma level. The sample for the pilot study which consists of 50 second year student teachers from Thiravium Teacher Training Institute situated in Theni District of Tamil Nadu. The sample for the final study which consists of 40 second year student teachers from District Institute of Education and Training situated in Uthamapalayam, Theni District of Tamil Nadu. It is found that the multimedia courseware attracts the learner as they learn Biology concepts easily through a combination of video, audio and textual modes. As multimedia courseware is one of the best suitable methods, this may be included as a part of teaching learning process in all educational institutions.

**Keywords:** Multimedia Courseware, Biology Concepts, Diploma Level Institutions

## I. INTRODUCTION

Effective pedagogy is the one which provides knowledge for learners by enhancing communication that promotes learning. As per the National Curriculum Framework of India - 2005, (NCF–2005) Multimedia Technology is introduced as pedagogy in Teacher Education Curriculum at Diploma level in Tamilnadu. By understanding the significance of Technology the scheme Sharva Shiksha Abhiyan (SSA) funded by Ministry of Human Resource Development (MHRD), New Delhi, provided multimedia resources like Computer, Laptop, LCD Projector and Educational CD's to almost all the schools for the process of effective teaching learning. The smart school efforts of Government of Tamil Nadu indicates that the government is serious to transform the education system from the traditional, rigid

and teacher dependent methods to a more contemporary, interactive and autonomous learning approach. So, the schools all over the state are in urgent need of teachers who are capable and comfortable with advanced technologies to meet the learning needs of the students. In order to cope up with the technological revolution in the teaching-learning process, it is indispensable to incorporate the latest technologies in all classroom learning. Appropriate technology in the hands of competent teachers can ensure a better teaching-learning process. The review of literature reveals that the multimedia courseware is one of the very effective pedagogy which stimulates the interest of learners and motivates them to acquire knowledge and skills. Non-availability of appropriate multimedia courseware to learn biology concepts of the respective standards demands the involvement of Teacher Educators in the production of such courseware. Hence, keeping all these points in view, the Investigator attempted an experiment to study the effectiveness of multimedia courseware in learning biology concepts among student teachers at Diploma level.

### A. Terms and Definitions

**Multimedia Courseware** - refers to the use of computers to present text, graphics, video, animation, and sound in an integrated way in teaching learning process.

**Learning** - refers to the act, process, or experience of gaining knowledge or skill.

**Biology Concept** - refers to an abstract or general idea inferred or derived from specific instances about Living organisms.

**Student Teachers** - refers to those who are studying Second year in Diploma in Teacher Education course.

## II. OBJECTIVES OF THE STUDY

1. To find out whether there is any significant difference between pre-test and post-test mean values of the control group;
2. To find out whether there is any significant difference between pre-test and post-test mean values of the experimental group;
3. To find out whether there is any significant difference between post-test mean values of the control group and experimental group.

## III. HYPOTHESES OF THE STUDY

In the light of the objectives stated above, the following hypotheses were formulated.

1. There is a significant difference between experimental group and control group in the pre-test performance in achievement in Biology.
2. There is a significant difference between the pre-test and post-test mean scores of the control group with reference to achievement.
3. There is a significant difference between the pre-test and post-test mean scores of the experimental group with reference to achievement.
4. There is a significant difference between post-test scores of control group and experimental group.

## IV. METHODOLOGY

Method : Experiment.

Design : Equivalent group.

Sampling: Purposive sampling.

### A. Sample for Pilot Study

The sample for the pilot study which consists of 50 second year student teachers from Thiravium Teacher Training Institute situated in Theni District of Tamilnadu.

### B. Sample for Final Study

The sample for the final study which consists of 40 second year student teachers from District Institute of Education and Training situated in Uthamapalayam, Theni District of Tamilnadu.

### C. Tools Used

1. Multimedia courseware on Biology constructed by Bagdhavatchala perumal, R. & Krishnamoorthy, K. (2011)
2. Entry behavior test.
3. Achievement test.

### D. Procedure

The sequential phases of operation of the study were as follows.

- a) An Entry behavior test was administered to the whole sample and based on the analysis of results, Control and Experimental groups were formed by employing matching technique.
- b) Academic content in Biology was identified and sequenced.
- c) Different programmes for experimenting the control group and the experimental group were prepared.
- d) A pre-test was structured and administered to both the groups before instructions.
- e) The content was taught through traditional method to control group and multimedia courseware was used to the experimental group.
- f) A post-test was administered to both the groups after instruction.

### E. Statistical Treatment

't' - test for significance of difference between the means of small independent sample was applied.

**V. HYPOTHESIS VERIFICATION*****Hypothesis 1***

There is a significant difference between experimental group and control group in the pre-test performance in achievement in Biology

The calculated 't' value 0.251 is lesser than the table value 1.684 at 0.05 level of significance. This shows that there is no significant difference between the achievement in control group and experimental group. The above findings confirm the effectiveness of balancing between the two groups (Control and Experimental).

TABLE I PRE-TEST PERFORMANCE (CONTROL GROUP VS EXPERIMENTAL)

Types of Groups	N	Mean	S.D	't' - Value	Level of Significance
Control Group	20	17.55	3.22	0.251	NS
Experimental Group	20	17.33	3.08		

NS – denotes not significant

***Hypothesis 2***

There is a significant difference between the pre-test and post-test mean scores of the control group with reference to achievement.

The calculated 't' value 3.272 is greater than the table value 2.423 at 0.01 level of significance. This shows that there is a significant difference between the Pre-test and Post-test performances in achievement of control group.

TABLE II PRE-TEST VS POST-TEST (CONTROL GROUP)

Types of Groups	N	Mean	S.D	't' - Value	Level of Significance
Pre-test	20	17.55	3.22	3.272	S
Post-test	20	21.55	4.42		

S – denotes significant

***Hypothesis 3***

There is a significant difference between the pre-test and post-test mean scores of the experimental group with reference to achievement.

The calculated 't' value 13.52 is greater than the table value 3.307 at 0.001 level of significance. This shows that there is a significant difference between the Pre-test and Post-test performances in achievement of experimental group. It is further noted that learning biology concepts through Multimedia courseware is found better in post test performance.

TABLE III PRE-TEST VS POST-TEST (EXPERIMENTAL GROUP)

Types of Groups	N	Mean	S.D	't' - Value	Level of Significance
Pre-test	20	17.3	3.08	13.52	S
Post-test	20	36.7	5.63		

S – denotes significant

**Hypothesis 4**

There is a significant difference between experimental group and control group in the Post-test performance in achievement in Biology.

The calculated ‘t’ value 9.467 is greater than the table value 3.307 at 0.001 level of significance. This shows that there is a significant difference between the control group and experimental group in achievement . It is further noted that the post – test mean scores of Experimental group is higher than the control group, shows that learning biology concepts through Multimedia courseware is found better.

TABLE IV POST-TEST PERFORMANCE (CONTROL GROUP VS EXPERIMENTAL)

Types of Groups	N	Mean	S.D	‘t’ - Value	Level of Significance
Control Group	20	21.55	4.42	9.467	S
Experimental Group	20	36.7	5.63		

S – denotes significant

**VI. IMPLICATION OF THE STUDY**

1. The results of the experimental study proved that learning through multimedia courseware is more effective than the traditional method.
2. Multimedia courseware attracts the learner as they learn Biology concepts easily through a combination of video, audio and textual modes.
3. As multimedia courseware is one of the best suitable methods, this may be included as a part of teaching learning process in all educational institutions.

**VII.CONCLUSION**

In traditional method the students are only passive learners. But multimedia courseware makes the students active and provides optimum opportunities to learn and retain various biology concepts. The present study is a modest endeavor to find out the effectiveness of learning concepts in Biology through multimedia course ware among student teachers at Diploma level. This study proves that learning Biology concepts through multimedia courseware has been more effective than traditional method.

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