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ORIGINAL ARTICLE

# STUDY THE DIFFERENCE BETWEEN PRE-TEST AND POST-TEST SCORES IN BIOLOGY AMONG CONTROL AND FOUR EXPERIMENTAL GROUPS

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**Abstract:**

*Information and Technology has invaded all aspects of human life. IT can play a major role in any educational set up, right from student registration to certification. Whether it is teaching or student administration, curriculum development or courseware development, use of IT has proved to be a boon. The paper explores the relevance of IT in education with a special focus on teaching biology through multimedia. It presents a use of multimedia package developed in teaching of Biology at the secondary level. Present study summarized that the given four different types of multimedia packages and also the conventional method are effective in learning Biology among the students selected for the study. Also we can interpret that, Text & Still Pictures + Audio + Animation multimedia package is most effective since it integrates the elements like text, still and motion pictures, animation and audio.*

**KEY WORDS:**

Pre-test , Biology , Technology , education.

## INTRODUCTION

The aim of Indian education policy is to generate a curriculum that is inclusive of the rich inheritance of different traditions of knowledge, work and crafts. The development of self-esteem and ethics and the need to cultivate children's creativity would receive primary importance. In the context of the quick changing and competitive global scenario, it's imperative that we respect children's native wisdom and imagination.

## LEARNING THROUGH MULTIMEDIA

For many, the typical classroom experience is a teacher imparting knowledge through lecture and presentation. This one-way communication tradition has resulted in transmission of knowledge to the passive learners since the dawn of time. Yet, increasingly, it is being challenged. The present modern Educational technologies have the ability to go beyond this. One such method is Multimedia. Through multimedia, we can prompt the learner to contemplate information, perform tasks, refine thinking, and demonstrate understanding. Multiple modalities (visual, audio and animation) and active learning make this possible.

Most traditional textbook approaches to teach a particular subject favor a linguistic or narrative approach. Such an approach will fail to reach those who may respond better to an artistic or naturalistic depiction of the topic. In addition, it also fails to develop those other neural connections and pathways and enhance those intelligences. This is where technology-based interactive approaches incorporating video and audio (in other words, multimedia) allow education and, in effect, learning to reach more students and

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provide more opportunities for active learning.

At its best, multimedia presents subject/contents to students in a more memorable, interesting way than books or a single medium can. Multimedia addresses different learning strategies. Researchers have shown that students learn better and retain more when audio-visual aids are added to a lecture. And when they "learn by doing" they retain up to 70% more than they do by simple listening to a lecture.

Multimedia makes learning more active. Active learning involves putting students in situations where they must read, speak, listen, contemplate, think deeply, write, and respond. Bonwell and Eison (1991) have defined the following attributes of active learning :

Students are involved in more than listening
Less emphasis is placed on transmitting information, and more emphasis is placed on developing students' skills
Students are involved in higher-order thinking (e.g., analysis, synthesis, evaluation)
Students are engaged in activities (e.g., discussion, writing, kinesthetic activities)
Greater emphasis is placed on students' explorations of their own attitudes.

**Some of the advantages of interactive multimedia are,**
Interactive instructions are much more effective than conventional instructions.
It allows practicing of already learnt procedures.
It allows simulation for expensive or inaccessible equipment.
Stand alone instructions for dispersed learners.

Multimedia can be defined in a variety of ways, but in the present research the term "multimedia" refers to an educational presentation made using the various media elements such as Text, Still Pictures, Video, Audio, Graphics and Animation.

**Review**

**The analysis of the multimedia related review studies reveals the following points :**
1.Multimedia that encourages the information to be processed referentially, building dual coded verbal and pictorial cognitive representations, seems to improve learning. In most of the studies related to the influence of picture, relevant, supportive illustrations / pictures improved the learning of textual information.
2.Findings of many research studies prove the positive influence of pictures on learning. The illustrations must show information that is presented in the text and the learners must be able to avoid getting distracted by the non-verbal media. It appears that supportive illustrations help to explain the textual material and allow learners to build connections between the verbal (text) and non-verbal (illustrations) information
3.Despite the plausibility of cognitively – based arguments for the benefits of animation, research to date has failed to provide unequivocal evidence that animation is superior to static depiction. In some cases animation can even prejudice learning.
4.The educational value of media format depends upon the ways in which its representational affordances interact with complex features of the learning environment, including learner characteristics, content domains, pedagogical strategies, and cognitive and social processes.

A critical appraisal studies revealed that there are some gaps on the effect of multimedia packages on learning. Hence, there is a need to bring together greater number of factors influencing on students learning. Therefore, the present study would assume its relevance and significance.

**OBJECTIVES**

1.To study the difference between pre-test and post-test in Biology among control group of the study.
2.To study the difference between pre-test and post-test in Biology among Experimental Group-1 of the study.
3. To study the difference between pre-test and post-test in Biology among Experimental Group-2 of the study.
4.To study the difference between pre-test and post-test in Biology among Experimental Group-3 of the study.
5.To study the difference between pre-test and post-test in Biology among Experimental Group-4 of the study.

## HYPOTHESES

1.There was a significant mean score difference between pretest and posttest in Biology among the control group of the study
2.There was a significant mean score difference between pretest and posttest in Biology among the EG1 of the study
3.There was a significant mean score difference between pretest and posttest in Biology among the EG2 of the study
4.There was a significant mean score difference between pretest and posttest in Biology among the EG3 of the study
5.There was a significant mean score difference between pretest and posttest in Biology among the EG4 of the study

### Method

Investigator was employing the "Pretest-Posttest Multi-Group Design" for the present study.

### Sample

The Multimedia packages were developed in English language, the experiment was done with the English medium schools only. After visiting most of schools, the researcher identified two English medium schools in Dandeli city to be used for the experimentation.

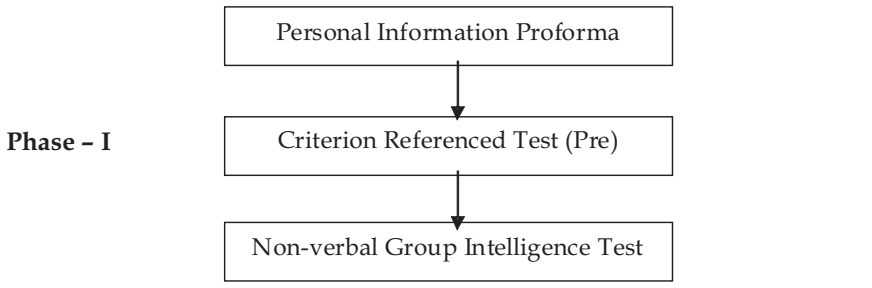
### Tools

The following tools were developed and adopted by the investigator for the purpose of data collection.

1)Multimedia packages on content of Biology subject – developed by the investigator.
2)Personal Information Proforma (PIP) – developed by the investigator.
3)Criterion Referenced Test (CRT) – developed and validated by the investigator.
4)Non Verbal Group Intelligence Test (NVGIT) – in order to measure this variable the investigator used the NVGIT Scale (2002) developed by Imtisungba Ao (Kohima).
5)Language Aptitude Test (LAT) – in order to measure this variable LAT (2004) developed and standardized by R. Ravi was used.

### Procedure

**Schematic Flow of Data Collection**



**Statistical Techniques**

**'t' test**

For testing the difference between the two means of pre-test and post-test scores of control and experimental groups.

**Analysis and Results**

**Table –1 : Mean Score Difference between the Pretest and Posttest in Biology among the Control and the Experimental Groups**

| Group | Test | N | Mean | Difference in Mean | S.D. | t-ratio | Level of Significance |
|---|---|---|---|---|---|---|---|
| Control | Post<br>Pre | 35 | 12.56<br>8.85 | 3.71 | 2.04 | 10.6 | 0.01 level |
| E 1 | Post<br>Pre | 35 | 14.24<br>8.94 | 5.29 | 2.59 | 11.93 | 0.01 level |
| E 2 | Post<br>Pre | 35 | 15.91<br>8.74 | 7.17 | 3.30 | 12.84 | 0.01 level |
| E 3 | Post<br>Pre | 35 | 14.89<br>7.63 | 7.26 | 3.77 | 11.39 | 0.01 level |
| E 4 | Post<br>Pre | 35 | 18.03<br>8.69 | 9.34 | 2.69 | 20.55 | 0.01 level |

Table shows that there is a mean score difference in knowledge in Biology between the pre-test and post-test in the control and all the experimental groups. Further these differences are statistically significant at 0.01 level and hence, the Hypothesis-1 is accepted. Moreover the table reveals that the mean score of post-test is higher than that of the pre-test in all the groups of the study.

It can be understood from the results that the manipulation of content on Biology i.e., Unit-Excretory system in man through the conventional teaching method and multimedia methods helped the students to acquire knowledge. Further, we can observe that the knowledge acquired is not similar in all the groups. The highest gain score is obtained by the Experimental group E-4, followed by E-3, E-2, E-1 and the control group in the descending order. Hence, the Type 4 multimedia package is most effective in learning Biology, whereas, conventional teaching is the least effective method.

Therefore, it can be summarized that the given four different types of multimedia packages and also the conventional method are effective in learning Biology among the students selected for the study. Also we can interpret that, Type 4 multimedia package is most effective since it integrates the elements like text, still and motion pictures, animation and audio. Whereas, in the conventional method the learning occurs only through the lecture which is monotonous and lacks any visual aids. This might be the reasons for the least effectiveness of the conventional method in learning Biology. Further, this result leads to study the between group differences in the knowledge gained by the students of the different groups of the study.

**EDUCATIONAL IMPLICATIONS**

· Using Multimedia Package learning different subjects can be extended to primary level, secondary level and higher secondary level.

It can be encouraged to implement to use in adult education
It may be implemented in teachers education
It may be implemented in alternative school
Slow learners can improve by using it

**CONCLUSION**

The study reveals that Students of standard IX students of Dandeli have problems in learning

Biology subject through conventional method. Learning Biology through Multimedia package is more effective than conventional methods. Hence it was more supportive to enrich Biological Science and technology in secondary school education.

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