



## EFFECT OF VIDEO PROGRAMMES IN DEVELOPING EXPERIMENTAL SKILLS AMONG PROSPECTIVE BIOLOGY TEACHERS

### KEYWORDS

Laboratory, Practical classes, hands on approach, Interactive video, physiology experiments, Experimental skills.

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**ABSTRACT** *The present study investigated the effect of video programmes in developing the Experimental skills among prospective Biology teachers. The sample of the study consisted of 31 prospective Biology teachers. The study adopted pre test, post test single group Experimental design. Before the introduction of video based programmes pre test was conducted to analyse the skills of prospective biology teachers.. Based on the findings of the pretest the researcher decided to introduce video based biology experiments to enhance the experimental skills of prospective biology teachers. The result indicated that the developed video programme has a significant influence on prospective teachers in developing the experimental skills. In addition the study analyse the difference between the male and female prospective teachers in developing the practical skills, and the result indicated that there is no significant difference among male and female prospective teachers.*

### Introduction

In Biology learning, laboratory plays very active and significant role as it is essential to develop concepts and principles because students are continuously required to identify the hidden concepts, define and explain underlying laws and theories using high level reasoning skills. Practical classes are intended to provide experience in planning and designing experiments and interpreting data, which are important key skills whether students will continue in laboratory science or not, as well as providing a relatively informal atmosphere for interaction between staff and students. , laboratories are important components of education to make students to gain experience. Especially when thinking that Biology is totally an applied branch of science, the importance of laboratory applications in instruction is clearly understood. In the biology laboratory students become active in their learning by seeing, observing and doing. Such kinds of application cause not only a better but also a permanent learning (Temel, Oral & Avanoğlu, 2000). Many researchers in science education admitted that laboratory studies increase students' interest and abilities for the science subjects.

### Importance of Experimental Works in Biology

Practical work is viewed as an essential component of studying the natural sciences. The 'hands on' approach has the potential to stimulate student interest in the subject matter, teach laboratory skills, enhance the learning of knowledge, give insight into the scientific method and develop scientific attitudes such as objectivity (Gorst & Lee, 2005). Saunders and Dickinson (1979) showed that biology students who attended laboratory classes learned more biology and acquired more positive attitudes to science than lecture-only students. Practical work also gives students the opportunity to learn and practice the type of activities involved in working as scientists (Meester & Maskill, 1995). Laboratory exercises such as biological dissections offer a sensory as well as an intellectual experience and students develop a sense of personal discovery which stimulates intellectual curiosity (Kinzie, Strauss & Foss, 1993). Laboratory exercises such as biological dissections offer a sensory as well as an intellectual experience and students develop

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### Alternatives in Biological Sciences Experiments

Modern high quality video is used at virtually all institutes, and can play an important role as a visual alternative to harmful animal use. For institutes with limited financial resources, video can be a realistic alternative to animal dissection and experimentation, especially when combined with other low-cost approaches to meeting teaching objectives. Though passive, video can provide good background to a subject and is often used as preparation and support material for work with other alternatives, such as surgery practice on simulators or Biology Practical in the Laboratory.

### Interactive video disc in Biology Experiments

Video technology, as an offshoot of TV technology, found an important niche in the Experimental Biology work, because of the possibilities it offers with the audio-visual, stimulation it provides. Videodiscs are optical discs that store sound, motion pictures, and still pictures. With a videodisc, the information is not read by the computer. The computer functions only as a controller for the videodisc player, accessing and playing the required frames. "Interactive" refers to the user's ability to react to the computer or videodisc player through a command and have the system respond either negatively or positively. This may be as simple as a user striking the wrong key and having a computer correct the user, or a user telling a videodisc player to go in a certain direction in a simulation.

### Need and Significance of the Study

In Biological science, medical and veterinary medical education, animals often play a central role in laboratory practical classes. The relationship between the animals and the students, however, is usually one of harmful use. Tens, if not hundreds of millions of animals across the world are used for experiments or killed for dissection every year. This leads to depletion of animals and rare plants in the world. So the alternatives are the sole method to overcome this problem without compromising the develop-

ment of laboratory skills and experiments in biology laboratory. Nowadays numbers of alternatives were emerged in the field of biology practical with the help of computer mediated technology. Numbers of such alternatives which we included in biology practical are simulations, virtual laboratory techniques video based practical and CD based interactive programmes.

### Objectives of the study

The following are the objectives are the study formulated by the investigator

- 1) To develop an interactive video based biology Experiments in the respective subject.
- 2) To find out the impact of developed video based experiments among prospective biology teachers.
- 3) To find out the difference between male and female biology prospective teaches in developing the Experimental skills using the developed video based programmes.

### HYPOTHESES OF THE STUDY

- 1) There exists a significant difference between the pre-test and post test mean scores of the prospective biology teachers in developing the experimental skills through video based biology experimental programmes.
- 2) There exists a significant difference between the male and female prospective biology teachers in developing the experimental skills through video based biology experimental programmes.
- 3) There exists a significant difference between the Undergraduates and post graduate prospective biology teachers in developing the experimental skills through video based biology experimental programmes.

### Methodology Adopted for the Study

This study adopted the single group pre and post experimental design.

### Sample used for the study

Sample consists of 31 B.Ed students (Prospective Biology Teachers), of which 17 are males and 14 are females.

### Tools used for the Study

#### Development of the video programmes in physiology experiments in biology-

The video programme was developed on the basis of one physiology experiments, that was conducted in the laboratory and it has been recorded with the help of experts. The videos of the experiments presented in the study were created by the researchers themselves. The video tapes were cut, edited, spliced and prepared for presentation using the Windows Movie Maker program.

#### Tools used for the Evaluation of Physiology Experimental skills

##### Pretest Tool

The pretest tool consists of statements regarding the Physiology experimental skills which depict the required area of experimental procedures, ability to perform the experiments etc., in the form of 5 point scale.

##### Evaluation format for post test

The check List format in the form of '5' point scale was used to find out the acquired experimental skills by the students

### Statistical Techniques Adopted for the Study

The differential analysis techniques was used for analyzing

the data as per the objectives of the study stated earlier.

### Analysis and Interpretation of Results

**Table I** Shows the pretest and post test mean scores of the effectiveness of the developed Physiology experiments among prospective biology teachers in developing the experimental skills through video based biology experimental programmes.

Test	N	Mean	S.D	'r'-Value	't'-Value	Significance
Pre-test	31	20.6875	4.9627	0.8921	4.8487	significant
Post-test	31	34.75	3.6787			

#### Significant at 0.01 Level

Statistically it is clear that there is significant difference between the mean scores of pre test and post test. This proves that the developed video programme has a positive impact on the Biology experimental skills of the prospective teachers.

**Table-II Showing** the Gender wise comparison of the post test mean scores of the effectiveness of the developed Physiology experiments among prospective biology teachers in developing the experimental skills through video based biology experimental programmes.

Group	N	Mean	S.D	't'-Value	significance
Boys	17	39.1875	4.7919	0.4326	Not significant
Girls	14	37.9286	6.0823		

#### Significant at 0.01 levels

It is very clear from the table 2 that there is no significant difference between the skills of boys and girls in developing experimental skills in biology through video based programme with regard to their post test.

**Table III** Showing the comparison of the post test mean scores of the effectiveness of the developed Physiology experiments among prospective biology teachers with respect to Graduates and Post graduates in developing the experimental skills through video based biology experimental programmes.

Group	N	Mean	S.D	't'-Value	significance
UG	15	34.0667	2.5486	4.1085	Significant
PG	16	43.25	2.9777		

#### Significant at 0.01 Level

It is inferred from the above table that there is significant difference between the Undergraduates and Post graduates in developing experimental skills in biology through video based programme with regard to their post test.

### Conclusion

During experimentation it was observed that the prospective teachers were very enthusiastic to do the experiments and curious to visualize the results and were enjoying the new experience and breaks the monotony and gives variety to the laboratory techniques in biology practical. On the basis of analysis and interpretation of data it can be con-

cluded that the students in the video based biology experimental programme, gain significant better to develop their experimental skills in biology.

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