



EFFECTIVENESS OF WEB BASED LEARNING ON ACADEMIC ACHIEVEMENT OF SECONDARY SCHOOL STUDENTS IN BIOLOGICAL SCIENCE

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ABSTRACT

In this study an attempt has been made to find out the effectiveness of Web Based Learning on Academic Achievement of Secondary School Students in Biological Science. In this study, 100 secondary school students studying in IX standard for the academic year 2018-19 were drawn as sample using purposive sampling technique. Achievement test constructed and validated by the researcher to assess the academic achievement of IX standard student's in Biological Science and Web Based Learning Package compiled and validated by the researcher were used for the collection of data. The collected data was analyzed by using descriptive statistics.

The results revealed that, the Post-test scores of Academic Achievement of Students of Experimental group are significantly higher as compared to Pre-test scores of Academic Achievement of Students in Biological Science.

KEYWORDS : Web based learning, academic achievement, secondary school students, Biological Science etc.,

INTRODUCTION

Due to advancements in the field of information and communication technology, this era is termed as an era of '*information and knowledge explosion*'. Information and communication technology has infiltrated each and every aspect of modern society. System of education is not an exception to such an infiltration. Thus, an integration of technology driven instructional strategies in routine classroom activities is a pre-condition to suit to the needs of technological era.

Technology driven learning experiences make the process of learning stress free and easy. Pace of learning can be accelerated by involving maximum number of senses. Sensory experiences forms the foundation of intellectual activity within any formal school situation. Web based learning is tailored to suit to the individual differences, learners pace, interest, attitude and aptitude. Meaningful learning begins with the learners' perception of stimuli, whether auditory, visual, tactile and relating to affective domain. Ensuring these initial learning experiences to be accurate, dependable and understandable is necessary to attaining the pre-determined teaching-learning objectives. Logically organized presentation of information, through a variety of media and its applications appeal learners' attention and make learning fun and enjoyable.

Web Based Learning and Teaching of Biological Science

Biological Science is a natural Science that deals with the living world and which embodies within its purview the concepts such as origin and structure of life, interaction between its components and other life processes.

At the Secondary School level, the subject Biological Science is introduced to the students as a foundation for human resource development, wherein the future career prospects are groomed, and potentials and talents of young ones' are discovered and energized and who may emerge as developing future scientists, technologists, engineers, and related professionals.

Application of inappropriate teaching methods or non-availability of teaching-learning resources have led to poor or low performance in the subject by the pupils.

The conventional method of teaching consists of lectures, oral instructions and guidance of the teacher. This method of teaching fails to encourage the students to interact and ask questions so as to understand the concepts taught thoroughly. Continuous application of this method makes the pupils passive learners.

Insightful learning and long term retention of the abstract concepts in Biological Science is not possible with conventional method of teaching.

In view of the changed educational scenario, the methods and strategies of teaching Biological Sciences at the Secondary School level needs re-consideration. Thus, there is a need of technology embedded pedagogical methods consisting of presentation of information through web using multimedia and its applications.

Review of Related Literature

The findings of the study conducted by Sung et.al (2015) reveals that, the experimental group exhibited significantly better learning attitudes, achievement and better critical thinking than the control group.

The findings of the study by Bhatnagar (2016) showed that, the ICT and its tools are very common phenomena in the field of education which is having a positive impact on teaching, learning and research. It also highlighted that, it enhances the quality of education and the effective use of ICT is the need of the hour.

An Experimental Study on Web Based Learning was conducted by Shailaja (2017) for ascertaining the secondary school students' scholastic achievement. The results showed that, web based learning improves the teaching effectiveness. It also suggests that, the teacher must know the use and application of new technological aids in routine classroom activates and should have thorough knowledge of technology and its applications so that he or she can easily convey the learning concepts on to the students. This study recommends adopting web based learning in the secondary schools.

In a meta-analytic study by Aravind (2018) it was found that, web based learning is an innovative teaching strategy of teaching Biological Sciences at secondary school level.

Major Objectives of the Study

1. To find out the impact of WBL technology on the Academic achievement of the secondary school students in Biological Science.
2. To identify the difference between control and experimental group with respect to Academic Achievement in Biological Science.

Limitations of the Study

1. The present study is limited to few selected topics in Biological Science.

2. The present study is limited to comparing Web Based Learning with conventional teaching.

Variables of the Study

Independent Variables:

- (a) Conventional Method of Instruction
- (b) Web Based Method of Instruction

Dependant Variable:Academic Achievement in Biological Science

METHODOLOGY

The study has been conducted by employing experimental method.

Population

In this study, Secondary school students (IX grade) studying in the academic year 2018-19 were considered as population of the study.

Sample

The purposive sampling technique was used to draw the sample. The sample consists of 100 pupils, among them 50 students constituted control group and 50 students constituted experimental group based on their intelligence by administering Raven's Standard Progressive Matrices.

Tools used for collection of data

Raven's Standard Progressive Matrices (R-SPM, 2000 Edition) to measure the intellectual capacity of the students for the purpose of paired matching, Achievement test constructed and validated by the researcher to assess the achievement of IX standard student's in Biological Science and Web Based Learning Package compiled and validated by the researcher were used for the collection of data.

Statistical Techniques

The collected data was analyzed by using descriptive statistics and the results obtained there from were represented through the graphs.

Hypotheses

H¹: There is no significant difference between Pre-test and Post-test Academic Achievement Scores of Students of Control group in Biological Science.

To test this hypothesis, the paired 't' test was applied and the results obtained there from are presented in the following table.

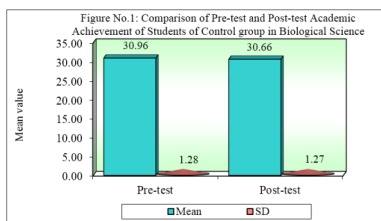
Table No. 1: Results of 't' test between Pre-test and Post-test Academic Achievement of Students of Control group in Biological Science.

Achievement	Mean	SD	Mean Diff	SD Diff	Paired 't'	p-value	Signi
Pre-test	30.96	1.28					
Post-test	30.66	1.27	0.30	1.30	1.6348	0.1085	>0.05, NS

*p<0.05

From the above table, it can be observed that, there is no significant difference between Pre-test and Post-test Academic Achievement of Students in Control group in Biological Science (t=1.6348, p>0.05) at 5% level of significance. Hence, the null hypothesis is accepted. It means that, the Pre-test and Post-test scores of Academic Achievement of Students in Control group in Biological Science are similar.

The Mean and SD scores of Pre-test and Post-test Academic Achievement of Students in Control group in Biological Science are also presented in the following figure.



H²: There is no significant difference between Pre-test and Post-test Academic Achievement of Students of Experimental group in Biological Science.

To test this hypothesis, the paired 't' test was applied and the results obtained there from are presented in the following table.

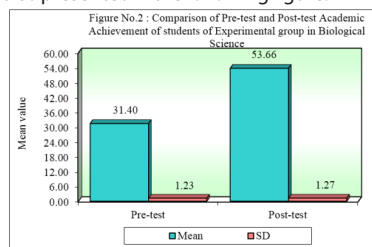
Table No. 2: Results of 't' test between Pre-test and Post-test Academic Achievement of Students of Experimental group in Biological Science.

Achievement	Mean	SD	Mean Diff	SD Diff	Paired 't'	p-value	Signi
Pre-test	31.40	1.23					
Post-test	53.66	1.27	-22.26	1.48	-106.2091	0.0001	<0.05, S

*p<0.05

From the above table, it can be observed that, a significant difference was observed between Pre-test and Post-test Academic Achievement of Students of Experimental group in Biological Science (t=-106.2091, p<0.05) at 5% level of significance. Hence, the null hypothesis is rejected. It can be concluded that, the Post-test scores of Academic Achievement of Students of Experimental group are significantly higher as compared to Pre-test scores of Academic Achievement in Biological Science.

The Mean and SD scores, Pre-test and Post-test Academic Achievement of Students of Experimental group in Biological Science are also presented in the following figure.



Major Finding of the study

1. The Post-test scores of Academic Achievement of Students of Experimental group are significantly higher as compared to Pre-test scores of Academic Achievement in Biological Science.

Educational Implications of the study

1. Web based learning supports a constructivist model of learning, where students can become more interactive and more involved in their own learning and thereby constructing their own knowledge.
2. Web based learning saves money and time and enhances active learning.

CONCLUSION

From the discussions hereinabove it is evident that, Web based learning is more effective teaching strategy than the conventional method of teaching. It fosters the cognitive abilities and develops in the learners' positive attitude and a sense of likeliness towards the subject than the conventional method of teaching. Significant improvements in the academic credentials are also found when such instructional strategies are implemented during the teaching-learners process. The use of animations, sound, and video and audio clips makes the lessons of Biological Science attractive and appealing.

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