



EFFECTIVENESS OF WEB BASED LEARNING ON STUDENTS ACHIEVEMENT IN BIOLOGICAL SCIENCE - AN EXPERIMENTAL STUDY

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ABSTRACT

In the present paper an attempt has been made to compare the achievement in Biological Science of boy and girl students of experimental group who learn from web based learning. The sample for the study was selected by purposive sampling technique. Students' achievement in Biological Science was measured by administering pre-test and post-test, which are constructed and standardized by the researcher. The data was analyzed by using differential statistics. The achievement scores of Pre-test and Post-test revealed that, the boy and girl students of experimental group have similar Pre-test and Post-test Academic Achievement scores in Biological Science. The findings further showed that, the boy and girl students of experimental group have similar mean gain Academic Achievement scores of Pre-test to Post-test in Biological Science.

KEYWORDS : Web based learning, Biological Science, Academic achievement tests etc.,

INTRODUCTION

Over the last few decades, the system of education especially school education has undergone a remarkable transformation. With the emergence of technology founded educational applications, learning has become easily accessible, which makes it much more interesting for students of all ages. Educational apps now bridge the communication gap between not only of parents and teachers, but also of pupils and teachers. Childhood is an important stage for learning. And because children become smarter and smarter, there is great need to introduce different, advanced learning means and methods.

The techno-powered educational infrastructure, pedagogies and resources have replaced the traditional textbooks and lecture method of teaching. Educational technology has changed the very structure and nature of the classrooms by transitioning from a 'traditional classroom' to 'technology-integrated classroom'.

Web based learning is a learner centered approach which paves way for stress free learning, cost effective method and so on. It connotes a further evolution of Computer Assisted Instruction. Universal accessibility, ease in updating content, and hyperlink functions that permit cross-referencing to other resources etc are the advantages of web based learning. These technical advancements, particularly hyperlink exploring and searching capabilities, fits the constructivist learning theory, where learners search out and create their own knowledge bases.

Need and Importance of the Study

The educational system is in the midst of change in view of the recent advancements in the field of information and communication technology. The learning styles and interactions between the teacher and the taught have been more effective and transformation of traditional classrooms into technology aided learning environments are affected (Agres et.al, 1998). Therefore, it becomes just and proper to assess the impact of WBL technology on scholastic performance of the pupils of the present technological era in order to design technology founded curriculum to suit the requirement of present student generation.

Many experiments have been done in various subjects till now to find the impact of web based learning resources on learning outcomes of students. Most of the results show positive outcomes, with students being enthusiastic about new methods of learning. Most of the experiments suggest that, this innovative approach to teaching is more effective than traditional approach to teaching. In the last few years efforts are being made in developing and using e-learning resources for teaching in theory and practice. It becomes new method of teaching and learning. This prompted the researcher to undertake this study.

Review of Related Literature

The use of Web Based Learning has a significant impact on students'

achievement and is better as compared to that of the traditional teaching and learning. Online learning had a positive impact on students' learning (Das, 2015).

Web Based Instruction saves time and increases the performance of the students in the examination and hence it is better to use of web based instruction in the educational context (Sirichom, 2016).

Web based learning improves the teaching effectiveness. Thus, the teacher must know the use and application of new technological aids in routine classroom activities 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 (Shailaja, 2017).

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.

OBJECTIVES OF THE STUDY

1. To find out the difference between boy and girl students of Experimental group with respect to Pre-test and Post-test scores of Academic Achievement in Biological Science.
2. To compare the effectiveness of web based learning on academic achievement of boy and girl students of Experimental group in Biological Science.

Limitations of the Study

The present study is limited only to comparing the Academic Achievement in Biological Science of boy and girl students of Experimental group in Pre-test and Post-tests.

Variables of the Study

Independent Variables	: (a) Conventional Method of Instruction (b) Web Based Method of Instruction
Dependant Variable	: Academic Achievement in Biological Science
Moderator Variable	: Gender (Boys/Girls)

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 drawn by using purposive sampling technique. 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,
- Achievement tests (Pre-test and Post-test) in Biological Science constructed and validated by the researcher and
- Web Based Learning Package compiled and validated by the researcher.

Statistical Techniques

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

Hypotheses

H₁ : There is no significant difference between boy and girl students of Experimental group with respect to Pre-test scores of Academic Achievement in Biological Science.

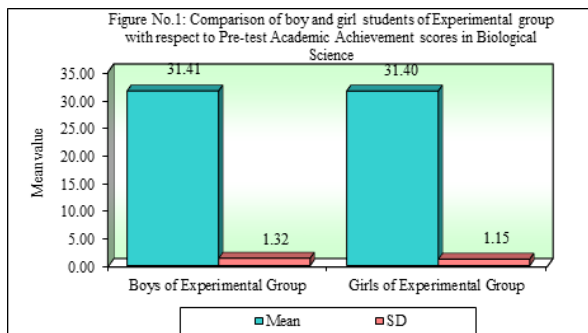
To test this hypothesis, the unpaired 't' test was applied and the results are presented in the following table.

Table No.1 : Results of 't' test between boy and girl students of Experimental group with respect to Pre-test Academic Achievement scores in Biological Science.

Gender	Mean	SD	t-value	p-value	Signi.
Boys of Experimental Group	53.64	1.32	-0.1101	0.9128	
Girls of Experimental Group	53.68	1.25		>0.05	NS

From the above table it is observed that, boy and girl students of Experimental group do not differ significantly with respect to Post-test Academic Achievement scores in Biological Science ($t=-0.1101$, $p>0.05$) at 5% level of significance. Hence, the null hypothesis is accepted. It can be concluded that, the boy and girl students of Experimental group have similar Post-test Academic Achievement scores in Biological Science.

The Mean and SD Post-test Academic Achievement scores in Biological Science of boy and girl students of Experimental group are also presented in the following figure.



H₂ : There is no significant difference between boy and girl students of Experimental group with respect to Post-test Academic Achievement scores in Biological Science.

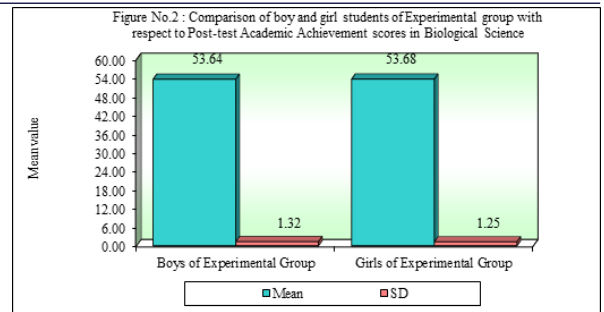
To test this hypothesis, the unpaired 't' test was applied and the results are presented in the following table.

Table No.2 : Results of 't' test between boy and girl students of Experimental group with respect to Post-test Academic Achievement scores in Biological Science.

Gender	Mean	SD	t-value	p-value	Signi.
Boys of Experimental Group	53.64	1.32	-0.1101	0.9128	
Girls of Experimental Group	53.68	1.25		>0.05	NS

From the above table it is observed that, boy and girl students of Experimental group do not differ significantly with respect to Post-test Academic Achievement scores in Biological Science ($t=-0.1101$, $p>0.05$) at 5% level of significance. Hence, the null hypothesis is accepted. It can be concluded that, the boy and girl students of Experimental group have similar Post-test Academic Achievement scores in Biological Science.

The Mean and SD Post-test Academic Achievement scores in Biological Science of boy and girl students of Experimental group are also presented in the following figure.



H₃ : There is no significant difference between boy and girl students of Experimental group with respect to mean gain Academic Achievement scores of Pre-test to Post-test in Biological Science.

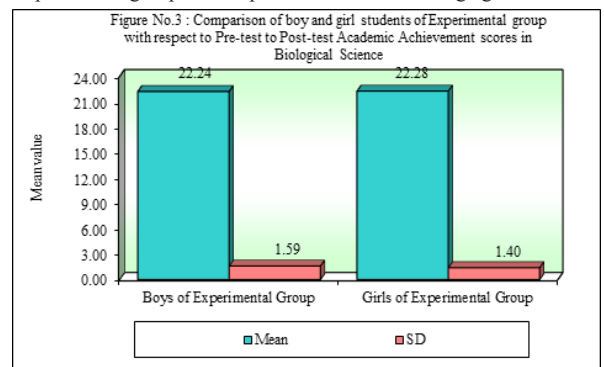
To test this hypothesis, the unpaired 't' test was applied and the results are presented in the following table.

Table No.3 : Results of 't' test between boy and girl students of Experimental group with respect to mean gain Academic Achievement scores of Pre-test to Post-test in Biological Science.

Gender	Mean	SD	t-value	p-value	Signi.
Boys of Experimental Group	22.24	1.59	-0.0945	0.9251	
Girls of Experimental Group	22.28	1.40			NS

From the above table, it can be observed that, boy and girl students of Experimental group do not differ significantly with respect to mean gain Academic Achievement scores of Pre-test to Post-test in Biological Science ($t=-0.0945$, $p>0.05$) at 5% level of significance. Hence, the null hypothesis is accepted. It can be concluded that, the boy and girl students of Experimental group have similar mean gain Academic Achievement scores of Pre-test to Post-test in Biological Science.

The Mean and SD mean gain Academic Achievement scores of Pre-test to Post-test in Biological Science of boy and girl students of Experimental group are also presented in the following figure.



Major Findings of the study

- The boy and girl students of Experimental group have similar Pre-test Academic Achievement scores in Biological Science.
- The boy and girl students of Experimental group have similar Post-test Academic Achievement scores in Biological Science.
- The boy and girl students of Experimental group have similar mean gain Academic Achievement scores of Pre-test to Post-test in Biological Science.

Educational Implications of the study

- Integration of web technology into the classroom and using it to its fullest potential will have a positive impact of increasing the student engagement in the classroom and also have a bearing impact on their academic credentials.
- Incorporation of web technology into classrooms enables the students to experience learning and they will also be inspired to collaborate with their peers.
- Stresses on participative and collaborative learning.

CONCLUSION

Development of educational applications offers 'n' number of benefits in the system of education. Students are more driven towards using

these e-applications for their learning. Thus, use of these applications is the perfect way to attract and motivate students towards learning and to enhance their overall skills (i.e., affective, cognitive and psychomotor domains).

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