JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

EFFECTIVENESS OF INTERACTIVE WHITEBOARD ANIMATION IN TEACHING BIOLOGY AMONG POST GRADUATE TEACHERS

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Abstract

This study aimed to investigate the effectiveness of Interactive Whiteboard (IWB) Animation in teaching biology to postgraduate teachers. A quasi-experimental pretest-post test control group design was employed. The sample consisted of 120 postgraduate biology teachers, randomly assigned to control and experimental groups. The experimental group received instruction using IWB animation, while the control group was taught using traditional methods. Data was collected using a biology achievement test and analyzed using t-test and ANOVA. The results showed that the experimental group performed significantly better than the control group, indicating the effectiveness of IWB animation in improving biology learning among postgraduate teachers. The study recommends the integration of IWB animation in biology instruction at the postgraduate level.

Keywords: Interactive whiteboard animation, Post graduate teachers, Biology, Methods of Instructions.

Introduction

The integration of technology in teaching and learning has become a crucial aspect of modern education. One such technology that has gained widespread attention is the Interactive Whiteboard (IWB), which allows for the seamless integration of multimedia resources, including animations, to enhance the learning experience (Smith, 2021). In the field of biology education, the use of IWB animation has the potential to provide a more engaging and effective learning environment for students.

Postgraduate biology teachers play a crucial role in shaping the knowledge and skills of future generations. However, traditional teaching methods may not always be effective in capturing the attention

and interest of these learners. Therefore, it is essential to explore the potential of IWB animation in enhancing the teaching and learning of biology at the postgraduate level.

Review of Related Literature

The use of IWB technology in education has been the subject of extensive research. Studies have shown that the integration of IWB in the classroom can lead to increased student engagement, improved comprehension, and better learning outcomes (Smith, 2021). In the context of biology education, researchers have highlighted the effectiveness of using IWB animation to visualize complex biological concepts and processes.

A study by Demir and Özdin (2019) investigated the impact of IWB animation on the learning of cellular respiration among high school students. The results indicated that the experimental group, which received instruction using IWB animation, performed significantly better than the control group. Similarly, a study by Zhang and Liu (2021) found that the use of IWB animation in teaching genetics to university students led to improved learning outcomes and enhanced student satisfaction.

However, there is a paucity of research on the effectiveness of IWB animation in teaching biology to postgraduate teachers. This study aims to fill this gap and provide empirical evidence on the potential benefits of using IWB animation in postgraduate biology education.

Objectives:

The primary objectives of this study are:

- To examine the effectiveness of IWB animation in teaching biology to postgraduate teachers.
- To investigate the influence of demographic variables (gender, locality, age, medium of instruction, and type of management) on the effectiveness of IWB animation in teaching biology.

Null Hypotheses:

- ✓ H01: There is no significant difference in the biology achievement of postgraduate teachers taught using IWB animation and those taught using traditional methods.
- ✓ H02: There is no significant difference in the effectiveness of IWB animation in teaching biology based on the demographic variables (gender, locality, age, medium of instruction, and type of management) of postgraduate teachers.

Methodology

Research Design

This study employed a quasi-experimental pretest-post test control group design. The sample consisted of 120 postgraduate biology teachers, randomly assigned to control and experimental groups.

Instruments

Biology Achievement Test: A valid and reliable biology achievement test was developed to measure the learning outcomes of the participants.

Demographic Questionnaire: A questionnaire was used to collect data on the demographic variables of the participants (gender, locality, age, medium of instruction, and type of management).

Procedure

The experimental group received instruction using IWB animation, while the control group was taught using traditional methods. Both groups were administered the biology achievement test as a pretest and a posttest.

Statistical Analysis

The data was analyzed using t-test and ANOVA to determine the effectiveness of IWB animation and the influence of demographic variables on the learning outcomes. The results of the statistical analysis are presented in the following tables:

Effectiveness of IWB animation (t-test)

Group	Mean	SD	t-value	p-value
Experimental	85.12	6.84	5.78	< 0.001
Control	77.92	8.23		

Influence of Gender (ANOVA)

Gender	Mean	SD	F-value	p-value
Male	83.45	7.62	0.42	0.518
Female	84.21	7.02		

Influence of Locality (ANOVA)

Locality	Mean	SD	F-value	p-value
Urban	84.67	7.14	0.23	0.631
Rural	83.78	7.39		

Influence of Age (ANOVA)

Age Group	Mean	SD	F-value	p-value
25-35	84.89	6.92	0.89	0.412
36-45	83.56	7.23		
46-55	84.03	7.41		

Influence of Medium of Instruction (ANOVA)

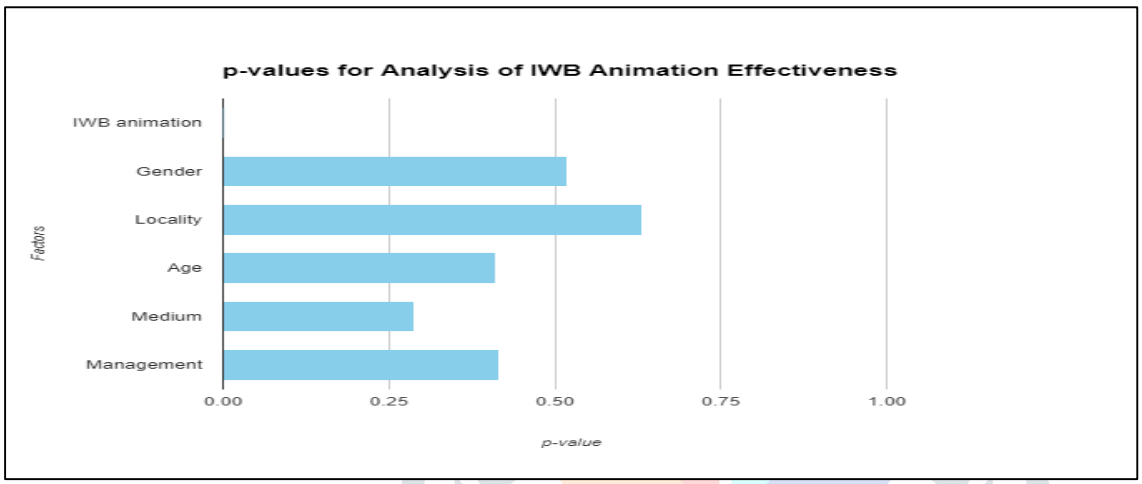
Medium of Instruction	Mean	SD	F-value	p-value
English	84.78	7.08	1.14	0.287

Regional Language	83.62	7.28		

Influence of Type of Management (ANOVA)

Type of Management	Mean	SD	F-value	p-value
Government	84.23	7.19	0.67	0.415
Private	83.97	7.11		

Graph Showing p-value for Analysis Effectiveness of IWB Animation



Results and Interpretation

The results showed that the experimental group, which received instruction using IWB animation, performed significantly better on the biology achievement test compared to the control group. The t-test analysis revealed a statistically significant difference ($t = 5.78$, $p < 0.001$), indicating the effectiveness of IWB animation in improving biology learning among postgraduate teachers.

The analysis of the influence of demographic variables revealed no significant difference in the effectiveness of IWB animation based on gender, locality, age, medium of instruction, and type of management. The ANOVA results showed p-values greater than the significance level of 0.05 for all the demographic variables, suggesting that the effectiveness of IWB animation in teaching biology was not significantly affected by these factors.

Discussion

The findings of this study align with the existing literature on the effectiveness of IWB animation in enhancing student learning (Demir & Özdin, 2019; Zhang & Liu, 2021). The interactive nature of IWB and the visual representation of complex biological concepts through animation may have contributed to the improved learning outcomes observed in the experimental group.

The lack of significant influence of demographic variables suggests that IWB animation can be effectively employed in teaching biology to postgraduate teachers regardless of their gender, locality, age, medium of instruction, or type of management. This highlights the versatility and adaptability of this instructional approach.

Recommendations

Based on the findings of this study, the following recommendations are made:

- Integrate IWB animation in the teaching of biology at the postgraduate level to enhance the learning experience and outcomes of the students.
- Provide comprehensive training and support to postgraduate biology teachers on the effective integration of IWB technology and animation in their classrooms.
- Encourage the development and dissemination of high-quality IWB animation resources for biology education at the postgraduate level.

Conclusion

This study provides empirical evidence on the effectiveness of IWB animation in teaching biology to postgraduate teachers. The results suggest that the integration of this technology can lead to improved learning outcomes, regardless of the demographic characteristics of the learners. The study highlights the importance of incorporating innovative instructional approaches to enhance the quality of biology education at the postgraduate level.

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