

## A COMPARATIVE STUDY OF THE EFFECTIVENESS OF VISUALIZATION LEARNING PACKAGE AND CONVENTIONAL METHOD FOR LEARNING BOTANY

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### Abstract

*The development of visualisation technology has opened new channels for putting educational and instructional concepts into practice. It effectively conveys knowledge and gives students the chance to organise and study exercises at their own pace. Visualization products combine text, images, sounds, educational, and amusing creations. It employs a variety of communication methods, including written text, recorded data, numeric data, drawings, photos, voice recordings, and videos. The present paper evaluates the comparative effectiveness of the visualization learning packages and conventional method for learning botany to XI class students. 50 Botany students of XI class of one Government school of Salem district were the subjects of the study. The data collection tools were the Visualization learning package and Botany Achievement Test. The Topic "Photosynthesis" was taught to the botany students of the control group through the conventional method of teaching and experimental group through a visualization learning package. The results of the t-test analysis of the pre-test and post-test mean achievement test scores revealed that there was a statistically significant difference between the achievement level of botany students of the control group and the experimental group. The findings of the study suggest that the Visualization learning package could be considered a better alternative to the conventional method for teaching botany.*

**Keywords:** Visualization Learning Package, Botany, Conventional Method, Effectiveness, Academic Achievement, Experimental Method.

### Multimedia Instruction

Text, photographs, sounds, and full-motion clips are all integrated into multimedia goods to create engaging, educational, and amusing performances. It employs a variety of communication methods, including written text, recorded data, numeric data, drawings, photos, voice recordings, and videos. Information representation and transmission have been significantly impacted by multimedia technologies. It has taken computer users to high-technology desktop systems that offer fun adventure and interactive learning. Multimedia products are complementary to the teaching-learning process as they assist the teachers in better communication of the content. These provide learning information to teachers, students and scholars in a newly engaging and meaningful way. Visual technology overcomes the limitations in science classrooms by enabling the investigations of phenomena that would otherwise be too expensive, time-consuming, and risky.

## **Background of the Study**

Multimedia can improve the academic achievement of students (Park, et al., 2019; Saputri & Indriayu, 2018) some other studies shared contrary opinions about the effectiveness of multimedia in improving the attitude of students towards science and its related disciplines (Ercan, 2014; Zahorec, Haskova & Bilek, 2014; Lipnevich, Gjicali, & Krumm, 2016; and Kareem, 2018). Multimedia has been defined in different contexts, depending on the multimedia element used. Mukherjee (2018) opined that multimedia should be interactive, should be controllable by the user.

Learning techniques to impact significantly learning (Bethel-Eke and Eremie (2019) and Magulod (2019). However, a few researchers have debunked the belief that learning techniques have a widespread impact on instructional performance. Munir, Ahmad, Hussain, and Ghani (2018); and, Huang, et. al. (2019) do now no longer discover any widespread dating among learning techniques and college students' instructional performance. Also, even as a few researchers advise that learning techniques problems need to be taken into attention while seeking to recognize how learners learn more efficaciously (Kirshner, 2017; Knoll et al., 2016), a few different researchers accept as true that educational designers do now no longer need to necessarily take students preferred learning techniques into account to facilitate learning, but rather focus on the attention of mental constraints (Moussa-Inatyetal., 2019). Hence, learning technique may be an important variable to also consider and experiment within this study. Gender inequality, especially in growing nations isn't a brand-new phenomenon. Ayittey, Arthur-Nyarko, & Onuman, 2020) finding supports that multimedia learning packages enhanced students' academic achievement. Akinbadewa (2020), computer-based multimedia instructional packages can bring about meaningful learning and improved academic achievement in Biology. Kousar & Vamadevappa (2019) found that significant improvement in Scientific Aptitude after the implementation of a multimedia package in science on 9th standard students of secondary schools in the experimental group and a multimedia package in science is effective in fostering scientific aptitude.

## **Objectives of the Study**

1. To compare the effectiveness of the conventional method for learning botany through visualization package in pre-test and post-test achievement scores of botany students of the control group.
2. To compare the effectiveness of the conventional method for learning botany through visualization package in pre-test and post-test achievement scores of botany students of the experimental group.
3. To compare the effectiveness of the conventional method for learning botany through a visualization package in post-test achievement scores of botany students of the control group and experimental group.

## Hypotheses of the Study

The following hypotheses are investigated by the researcher: such as

**Hypothesis 1:** There is no significant difference in the effectiveness of the conventional method for learning botany through visualization package in pre-test and post-test mean achievement scores of botany students of the control group.

**Hypothesis 2:** There is no significant difference in the effectiveness of the conventional method for learning botany through the visualization package in pre-test and post-test achievement scores of botany students of the experimental group.

**Hypothesis 3:** There is no significant difference effectiveness of the conventional method for learning botany through the visualization package in post-test achievement scores of botany students of the control group and experimental group.

## Sample

A sample of the 50 botany students of XI class was selected purposively from one school from Salem District. The control group was comprised of 25 botany students who were taught through the **Conventional method** of teaching and the experimental group was comprised of 25 students who were taught through the intervention programme conducted by the researcher to

## Visualization Learning Package

### Design

One group pre-test and post-test design

### Tools used

- Package for Visualization Learning
- Questionnaire for Botany Achievement Test

## Analyses and Interpretation of Data

The data collected from the sample of the study was organized and tabulated to facilitate the application of appropriate statistical techniques for its analysis. The score complied, Mean, and Standard Deviation was computed for the table, and 'the t-test was chosen because the researcher wished to test the null hypothesis. The true level of significance was considered, i.e. 0.01 level of significance as an arbitrary standard for accepting or rejecting the null hypotheses.

**Hypothesis 1:** There is no significant difference in the effectiveness of the conventional method for learning botany through visualization package in pre-test and post-test achievement scores of botany students of the control group.\

**Table 1 Significant Difference in the Effectiveness of the Conventional Method for Learning Botany through Visualization Package in Pre-Test and Post-Test Achievement Scores of botany Students of the Control Group**

Control Group	N	Mean	SD	t-value
Pre-Test Control group	25	8.32	1.81	32.92
Post Test Control group	25	29.08	3.39	

Table (1) showed that the calculated values of pre-test and post-test achievement scores of control group botany students are found to be 8.32 and 29.08 respectively. The obtained calculated 't'-value 32.92 which is found that the significant at 0.01 level of significance. The calculated 't' value of 32.92 is higher than the tabulated value of 2.48 at a 0.01 level of significance. Consequently, the null hypothesis is not accepted. The result concluded that there is a significant difference in the effectiveness of the conventional method for learning botany through visualization package in pre-test and post-test achievement scores of botany students of the control group botany students.

**Hypothesis 2:** There is no significant difference in the effectiveness of the conventional method for learning botany through visualization package in pre-test and post-test achievement scores of botany students of the experimental group.

**Table 2 Significant Difference in the Effectiveness of the Conventional Method for Learning Botany through Visualization Package in Pre-Test and Post-Test Achievement Scores of Botany Students of the Experimental Group**

Experimental Group	N	Mean	SD	t-value
Pre-Test Experimental group	25	8.56	1.68	73.57
Post Test Experimental group	25	42.04	2.01	

Table (2) showed that the calculated values of pre-test and post-test achievement scores of control group botany students are found to be 8.56 and 42.04 respectively. The obtained calculated 't'-value 73.57 which is found that the significant at 0.01 level of significance. The calculated 't' value of 73.57 is higher than the tabulated value of 2.48 at a 0.01 level of significance. Consequently, the null hypothesis is not accepted. The result concluded that there is a significant difference in the effectiveness of the conventional method for learning botany through visualization packages in pre-test and post-test achievement scores of experimental group botany students.

**Hypothesis 3:** There is no significant difference in the effectiveness of the conventional method for learning botany through visualization package in post-test achievement scores of botany students of the control group and experimental group.

**Table 3 Significant Difference in the Effectiveness of the Conventional Method for Learning Botany through Visualization Package in Post-Test Achievement Scores of Botany Students of the Control Group and Experimental Group**

Testing groups	N	Mean	SD	t-value
Post-Test Control group	25	29.08	3.39	14.38
Post Test Experimental group	25	42.04	2.01	

Table (3) inferred that the calculated 't' value of the post-test control group and post-test of the experimental group botany students' mean achievement score of 14.38 is higher than the tabulated value of 2.48 at 0.01 level of significance. Consequently, the null hypothesis is not accepted. The result concluded that there is a significant difference in the mean achievement score of the post-test control group and post-test experimental group botany students.

### Findings of the Study

#### Following are the findings of the Study

There is a significant difference was found in the pre-test and post-test achievement scores of botany students of the control group after the experimental treatment. The above-given finding infers that the conventional method of teaching was found effective concerning academic achievement in botany.

There is a significant difference was found in the pre-test and post-test achievement scores of botany students of the experimental group after the experimental treatment. From the above given finding infer that the visualization learning package was found effective with respect to academic achievement in botany.

There is a significant difference was found in the post-test achievement scores of botany students of the control group and experimental group elucidating that experimental treatment yielded a significant difference in post-test mean achievement scores of botany students. The above-given finding is that botany students of the experimental group who were taught through a visualization learning package exhibited better achievement in botany as compared control group who were taught through the conventional method.

### Discussion of the Results

The visualization learning package affects students' performance in botany. Most of them have concluded that multimedia instruction helps students learn and succeed better than other teaching strategies or methodologies. In this study, the botany

students of the Experimental Group who were taught through the visualization learning package achieved better than the Control Group who were taught through the conventional method of teaching.

### Conclusion

From the findings of the study, the botany students of the experimental group who were taught through the visualization learning package exhibited better achievement in botany as compared control group who were taught through the conventional method of teaching. The visualization learning package was found more effective as compared to the conventional method for teaching botany students in XI class. It may be concluded that the visualization learning package contributed to raising the achievement of botany Students. Based on the results of the study visualization learning packages can be used for learning students as it enhances their academic achievement and is the best technique to increase students' achievement, interest and active participation in classroom teaching learning.

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