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Effectiveness of Interactive Visualization Strategy on Achievement of Educational Technology of Prospective Teachers of Kerala

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***Abstract*-- The study aimed to test the effectiveness of the Interactive Visualization Strategy on Achievement in Educational Technology at B.Ed. The present study has been conducted on a sample of 60 B.Ed. Students. Lesson transcripts based on the Interactive Visualization Strategy, Lesson transcripts based on the Lecture method, and Achievement tests on Educational Technology were used to collect data. The statistical techniques adopted are the t-test on Educational Technology. The study revealed that the achievement of B.Ed. Students taught through the Interactive Visualization Strategy are more effective than those taught through the Lecture method.**

***Keyterms*-- Effectiveness, Interactive Visualization Strategy, Achievement, Prospective teachers.**

I. INTRODUCTION

Education is the most fabulous jewel of humankind. A glimpse of it can enrich and enlighten the entire process and development of society. Human resources development is the supreme task of all progressive societies. The development of a nation is the development of the innate abilities and powers of its individuals. The unprecedented development of science and technology of modern times has resulted in the explosion of knowledge. New trends in education are emerging to play a dynamic role in meeting the sweeping needs of the time, place, and person. The field of educational operations has been focused on continuous experimentation with the content approach and the product of education, to articulate the harmonious development of our students.

There were numerous positives and negatives associated with education technology. However, technology and education are a great combination if used together with the right reason and vision.Technology has the capacity to change the education beyond the four walls of a classroom. With the recent growth in mobile technologies witnessing the emergence of flexible, open learning environments that enable contextual, real-time, interactive, and personalized learning."Instruction ends in the classroom, but education ends only with life".

Computer awareness is the basis for technological innovations in education. Computers are revolutionizing all fields of activity nowadays. With the quest for knowledge growing at a rapid pace and the human intellect becoming increasingly inquisitive, the need for data warehousing, data analysis, decision-making, and presentation has become a crucial aspect of modern living. From the scientist and technologist to the commoner, everybody has experienced the touch of a machine through local area networks, wide area networks, and the Internet, which access and present information.

Information Communication Technology

Across the globe, there is a growing trend to incorporate ICT into the teaching and learning process. The teacher and learner must have access to technology to improve learning outcomes. ICT is an essential tool that can transform the current isolated, book-centered learning environment into a rich, student-centered environment. In today's society, the use of ICT is becoming increasingly ubiquitous. ICT can help students to learn more, better, and faster. Still, such improvements are incremental. They are not second-order changes. They cannot hope to make even a dent in the rapidly growing totality of human knowledge. ICT can solve many of the problems and accomplish many of the tasks that students are currently learning to do by hand. Moreover, ICT can help students become substantially more productive in solving problems and accomplishing tasks. If appropriately educated, a student working with an ICT system can far outperform a student who lacks such an aid in a wide range of problem-solving tasks. Our educational system will undergo significant changes over the next three decades as it incorporates the idea of integrating ICT with student education. ICT has become an integral part of today's teaching-learning process. Countries worldwide are utilizing ICT to facilitate information dissemination and communication across all areas of education and training. Improving the quality of education and training is a crucial issue, particularly during periods of educational expansion.

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ICT can improve the quality of education in various ways: by increasing learner motivation and engagement, by facilitating the acquisition of basic skills, and by improving teacher training.

Concept of interactive visualization

Students learn best when they see several representations of a concept, including textual, visual, and animated. Textbooks can provide textual and some visual representations. However, software tools offer a visual and animated view. However, observing is not enough. To check their understanding of a concept, students must be able to interact with it in some way and receive feedback. Future education and training require proper tools that can overcome space, time, and performance demands. Such demands are underscored by the growing geographical distribution of education and training centers, the need for continuous technological updates, and the enhanced learning effectiveness achieved through the integrated use of multiple forms of information. Such tools can be developed using multimedia communication systems for educational and training purposes (Papandreou & Adamopoulos, 1998).

Visualization technology is developing rapidly, providing a spectrum of possibilities for educational integration. There is thus a need for research data to stimulate the integration of innovative visualization methods with pedagogical practice. With the ready availability and potential for educational use of our own fundamental artifact, the computer, it is natural to expect that computer science educators would turn to using computers in hopes of finding new ways to convey the core knowledge of their discipline. For a successful interactive visualization, students should be in control of the visualization and should receive feedback immediately. Control includes changing the input, changing the speed, allowing movement forward and backward, and the ability to reproduce the result. Students should be able to create their own input and receive immediate feedback on it.

II. Hypothesis Of The Study

The hypothesis formulated for the present study were,

1. There will be a significant difference in achievement in the Educational Technology of B.Ed. Students were taught through the Interactive Visualization Strategy and the Lecture cum Demonstration Method.

III. Objectives Of The Study

2. To find out the effectiveness of the Interactive Visualization Strategy and the Lecture Method on Achievement in Educational Technologyamong B.Ed. Students.
3. To compare the effectiveness of the Interactive visualization strategy and Lecture cum Demonstration methods on the achievement of Educational Technology among B.Ed Students.

IV. Methodology And Sample Selected

The Experimental method was used for the present study. The design selected was the pretest-posttest non-equivalent group design. The study was conducted on a sample of 60 B.Ed. Students, of whom 30 were selected as the experimental group and the remaining 30 students as the control group.

Tools used for the study:

The tools used for the study were:

a. Lessons transcripts prepared using the Interactive Visualization Strategy.

b. Lesson transcripts based on the Lecture Method.

c. Achievement test.

V. Statistical Techniques Used

Statistical techniques provide an indispensable tool for collecting, analyzing, and interpreting data. These methods can facilitate the derivation of conclusions and the formulation of generalizations. The researcher has employed the following statistical techniques to analyze the data from the learning style inventory. The investigator used the following primary statistical methods to analyze the data: Mean, Median, and Mode. Standard deviation, Skewness, Kurtosis, Test of significance of difference between means.

VI. Analysis And Interpretation Of The Data

Analysis and interpretation of data is considered the heart of any research work.

Comparison of Experimental and Control groups about pre-test scores

Before starting the experiment, an achievement test in Educational Technology was administered by the investigator as a pre-test to both groups.

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The arithmetic mean, median, mode, standard deviation, skewness, and kurtosis of the pre-test scores were calculated. Table 1.1 below shows the statistical measures of the pre-test scores of the two groups.

Table 1.1
Statistical measures for pre-test scores of the Control and Experimental groups on the Achievement test in Educational Technology

Group	Mean	Median	Mode	SD	Skewness	kurtosis
Experimental	8.9	9	10	2.24	-0.13	0.264
Control	8.8	9	8	2.97	-0.2	0.234

The arithmetic mean of scores obtained by the Experimental group is 8.9, and that of the Control group is 8.8. The median score for both groups is 9. The modes of the scores obtained by the Experimental group and Control group are 10 and 8, respectively. The standard deviation of the Experimental group is 2.27, and the standard deviation of the Control group is 2.97. The distribution of the Experimental and Control groups is negatively skewed. This reveals that the distribution is approximately normal.

Table 1.2
Test of significance of difference between mean scores of Pre Test of Control and Experimental group on Achievement in Educational Technology

Group	**N**	**M**	**SD**	**CR**	**Level of Significance**
Experimental	30	8.9	2.24	0.15	Not Significant at 0.05 Level
Control	30	8.8	2.97		

From Table 1.2, there is no significant difference between the pre-test scores of Educational Technology conducted by the two schools.

The test of significance of the difference between means 0.15 is not significant at the 0.05 level as compared to the table values. This shows that there is no significant difference between the groups in the pre-test in Educational Technology.

Comparison of Experimental and Control groups with respect to Post Test scores

The same achievement test in Computer Science was administered to both the Experimental and Control groups as a post-test to measure the achievement after the experiment.To find out the effectiveness of the Interactive Visualization Strategy, the pre-test and post-test scores of the Experimental and Control groups were compared mainly using the test of significance of difference between means. The Table shows the statistical representation of post-test scores of Achievement in Educational Technology.

Table 1.3
Statistical measures for post test of Control and Experimental group on Achievement test in Educational Technology

Group	Mean	Median	Mode	SD	Skewness	kurtosis
Experimental	35.57	36	36	6.2	-0.21	0.323
Control	24.57	25	30	7.59	-0.17	0.277

The maximum score of the achievement test in Educational Technology 50. The arithmetic mean of the scores obtained by the Control group is 24.57, and that for the Experimental group is 35.57. The median of the scores of the Experimental group and Control group are 36and 25, respectively. The mode of the Experimental group is 36, and the Control group is 30. The standard deviation of the Experimental group is 7.59, and the Control group is 6.2. The two distributions are negatively skewed and leptokurtic. These results indicate that the students in the Experimental group achieved higher scores on the post-test compared to the control group. This shows that the interactive visualization strategy is more effective in teaching Educational Technology than the Lecturecum Demonstration Method.

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Table 1.4
Test of significance of the difference between the means of both Pre Test and post test of Control and Experimental group on Achievement test in Educational Technology.

Test	Groups	N	M	SD	CR	Level of Significance
Pre Test	Experimental	30	8.9	2.24	0.15	Not Significant at 0.05 Level
	Control	30	8.8	2.97		
Post Test	Experimental	30	35.57	6.2	6.16	Significant at .01Level
	Control	30	24.57	7.59		

From Table 1.4, it is inferred that both the Experimental and Control groups do not differ significantly in their Pre Test scores. (Since calculated CR=0.15<1.96 at 0.05 level). From the Table, it is inferred that both the Experimental and Control groups differ significantly in their post-test scores. (Since calculated CR=6.16>2.59 at .01level).It can be concluded that the Interactive Visualization Strategy is more effective than the Lecture cum Demonstration Method in learningEducational Technology.

VII. Findings Of The Study

Findings regarding the effectiveness of the Interactive Visualization Strategy in achievement in Educational Technology. The analysis of Post-test scores using the test of significance of difference between groups revealed that t-value obtained (t =6.16) is significant at 0.01 level. The mean scores (M_1=35.57, M_2=24.57) helped to state that the Experimental group taught with the Interactive Visualization Strategy is in an advantageous position with respect to achievement in Educational Technology.

The study shows that the Interactive visualization strategy is more effective than the Lecture cum Demonstration method of teaching educational technology. Interactive visualization improves students' achievement and enables students to memorize the concepts in a better way. Teachers can use the Interactive visualization strategy at any level of education.

VIII. Conclusions Of The Study

The Interactive Visualization Strategy is focused on the levels of understanding and application. This model has a wide application in teaching basic and higher-level competencies in higher education. The major conclusions of the present study are outlined below. Teaching using the Interactive Visualization Strategy is more effective than the Lecture cum Demonstration Method on Achievement in Educational Technology of B. Ed students.

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