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# AN EXPERIMENTAL STUDY ON COMPARISON OF CONVENTIONAL AND INTERACTIVE WHITEBOARD TEACHING AMONG AND WITHIN THE BRANCHES OF SCIENCE

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***Abstract***

*Modern age is the age of science and technology. The world of today is very dynamic and we are the witnesses of series of technological innovations in our day to day life. The globalization of technology stays to transformation the manner we live and work. Teaching and learning stand more successful when technology is added to the classroom and to progress students' learning and to support them extent their aims. Interactive Whiteboard is an influential device in the classroom adding interactivity and association, allowing the integration of media content into the lecture and supporting collaborative learning. Hence researcher would like to study on Interactive Whiteboard teaching in learning Science in Krishna District, Andhra Pradesh, India. True-Experimental research design was used for this study. The population of the study was made up of 8th class CBSE Students. The sample population was made up of 160 students. This study intends to find out the effectiveness of Interactive Whiteboard teaching in learning Science. Objectives, Hypotheses, Tool, Sample, Method, Data Analysis, and Educational Implications are discussed as follows.*

***Key Words**: Technology, Conventional, Learning, Interactive Whiteboard,*



## Introduction

Global era is benefitted with a great deal of the scientific and technological advancements of the late 20th century. Novel invention of technology is influencing the future of advanced education and prompting teaching approaches. The essential purposes of teaching science into inspire the students' confidence and concentration towards science. It is conceivable only when students ensure somewhat themselves utilizes some unprepared teaching aids and creates save enhancements in them.

Interactive Whiteboard classrooms are technology improved classrooms that foster chances for teaching and learning through combining technology for example computers, specified software, assistive heeding tools, networking and audio or visual competences. Interactive

classrooms use all interactive components like videos and power point presentations and these visually interesting methods of teaching become engaging to students who are already struggling with the old-fashioned method of teaching in a classroom.

**Review of Related Literature**

Murcia (2007) studied that understanding of key enduring science concepts and the investigative and social aspects of working scientifically. The aim was to engage students and provide opportunities for construction of scientific understandings. The assumption was that to be effective primary science teachers the students needed to develop their scientific literacy. It would develop a general, broad and useful understanding of science that contributed to their competence and disposition to use science to meet the personal and social demands of their life at home, at work and in the community. The study revealed that science as a tool for inquiry or discovery and the use of science for learning, informing or contributing to problem solving and critically reflects on the use of science with reference to context.

Betcher and Lee (2010) studied scientifically on Interactive white board, ICT, interactive, technology in education to find out learning technology in education by survey method which found that the uses of interactive white board enhances motivation learn and raises the level of concentration improve behavior and enhances learning because it was fun and innovative.

Elharr (2010) found the relationship between the use of interactive board and student achievement. To find out, he employed survey and observed the execution of the Interactive board in grade V and VI in several areas of Australia Students who learned with the interactive white board scored better achievement and nationwide tests math and languages in 2003 the modification was minor and didn't repeat itself and a comparable test administered in 2004. An exhaustive analysis of the data indications are that the usage of the interactive white board contributed primary to the accomplishment of students who were weak in the part of writing.

Dr. Anita Menon (2015) critically studied the effectiveness of smart classroom teaching on the achievement of secondary school students on chemistry and studied the effectiveness of different classroom teachings i.e. Smart Classroom teaching and conventional mode of teaching on achievement of class IX students in chemistry with respect to gender and to study the academic achievement and the interactional effect of it on them. She experimented on 330 students and concluded that there was no effect on the academic

achievement in chemistry of secondary school students, boys or girls even when taught through smart classroom teaching and conventional teaching.

Jayamani P (1991) presented a brief analysis on the effectiveness of the stimulation model in teaching physics to standard XI students through CAI that both the CAI strategies were superior to the traditional method of instruction and CAI with TSS was more effective than CAI without TSS for under achievers.

**Objectives of the Study**

1. To find and compare the Pretest mean scores of 1. Control group Experimental group students among and within the branches of science.
2. To find and compare the Posttest mean scores of 1. Control group Experimental group students among and within the branches of science.

**Hypotheses of the Study**

1. There would be no significant difference between the Pretest mean scores of Control group students among and within the branches of science.
2. There would be no significant difference between the Pretest mean scores of Experimental group students among and within the branches of science.
3. There would be no significant difference between the Posttest mean scores of Control group students among and within the branches of science.
4. There would be no significant difference between the Posttest mean scores of Experimental group students among and within the branches of science.

**Methodology of the Study**

True-Experimental design was adopted for this study.

**Sample for the Study**

A sample of 160 pupils from $8^{th}$ class from CBSE School in Krishna District, Andhra Pradesh.

**Tool of the Study**

Pretest was prepared from the previous knowledge of the three units from $8^{th}$ class CBSE Science Text Book. That is Light from Physics, Metals and Non-Metals from Chemistry and Reproduction from Biology. The test was constructed on the norms and standards of the achievement test.

A questionnaire in Physics was prepared by taking different areas to assess the following components:

1. Knowledge

2. Understanding

3. Application

4. Skill

**Analysis and Interpretation Of Data**

These investigative approaches may prove very useful in the study of data of any research work and no resemblances, changes, tendencies and significant aspects would go ignored by the researcher. The researcher has analyzed the total mean scores from Physics, Chemistry and Biology.

**Objective-1**

To find and compare the Pretest mean scores of 1. Control group 2. Experimental group students among and within the branches of science.

**Hypothesis-1A**

There would be no significant difference between the Pretest mean scores of Control group students among and within the branches of science.

**Hypothesis-1B**

There would be no significant difference between the Pretest mean scores of Experimental group students among and within the branches of science.

These hypotheses were tested by analyzing the Pretest mean scores of Control group and Experimental group students. The comparisons were tested by finding Mean, S.D and F-value of the scores from Conventional teaching and Interactive Whiteboard teaching and the results were tabulated in table-1.

**Table-1**

**Analysis of Control and Experimental group students learning through Pretest**

| **ANOVA Summary** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **S. No** | **Group** | **Variable** | **Category** | **N** | **Mean** | **SD** | **F-value** |
| **1** | **Control Group** | **Subjects** | **Physics** | 80 | 15.51 | 3.90 | **1.999$^{NS}$** |
| | | | **Chemistry** | 80 | 15.20 | 3.97 | |
| | | | **Biology** | 80 | 16.43 | 4.20 | |
| | | **Source of Variation** | **Sum of Squares (SS)** | | **df** | **Mean Squares (MS)** | |
| | | **Between Groups** | 64.825 | | 2 | 32.4125 | |
| | | **Within Groups** | 3842.338 | | 237 | 16.2124 | |
| | | **Total** | 3907.163 | | 239 | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | **Subjects** | **Physics** | 80 | 15.54 | 3.97 | |
| | | | **Chemistry** | 80 | 15.26 | 3.88 | |
| | | | **Biology** | 80 | 16.60 | 4.24 | |
| **2** | **Experimental Group** | **Source of Variation** | **Sum of Squares (SS)** | | **df** | **Mean Squares (MS)** | **2.453$^{NS}$** |
| | | **Between Groups** | 79.825 | | 2 | 39.9125 | |
| | | **Within Groups** | 3856.575 | | 237 | 16.2725 | |
| | | **Total** | 3936.4 | | 239 | | |

**NS – Not Significant at 0.01 Level**

From the above table 1, it was observed that the F-values calculated among Physics, Chemistry and Biology of Control group and Experimental group students were not significant. Therefore no significant differences were observed among Physics, Chemistry and Biology of Control group and Experimental group students in the comparison. It may be concluded that there were no significant differences among Physics, Chemistry and Biology of Control group and Experimental group students in learning science concepts. Hence the sub hypotheses "There would be no significant differences between the Pretest mean scores of Control group and Experimental group students among and within the branches of science" were accepted. Thus, it was concluded that Control group students have no significant effect among and within the performance of Physics, Chemistry and Biology concepts in learning science before the experiment. Similarly it was concluded that Experimental group students have no significant effect among and within the performance of Physics, Chemistry and Biology concepts in learning science before the experiment.

**Objective-2**

To find and compare the Posttest mean scores of 1. Control group 2. Experimental group students among and within the branches of science.

**Hypothesis-2A**

There would be no significant difference between the Posttest mean scores of Control group students among and within the branches of science.

**Hypothesis-2B**

There would be no significant difference between the Posttest mean scores of Experimental group students among and within the branches of science.

These hypotheses were tested by analyzing the Posttest mean scores of Control group and Experimental group students. The comparisons were tested by finding Mean, S.D and F-

value of the scores of Conventional teaching and Interactive Whiteboard teaching and the results were tabulated in table-2.

**Table-2**

**Analysis of Control and Experimental group students learning through Posttest**

| **ANOVA Summary** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **S.No** | **Group** | **Variable** | **Category** | **N** | **Mean** | **SD** | **F-value** |
| **1** | **Control Group** | **Subjects** | **Physics** | 80 | 15.76 | 3.96 | |
| | | | **Chemistry** | 80 | 15.39 | 3.87 | |
| | | | **Biology** | 80 | 16.90 | 4.08 | |
| | | **Source of Variation** | **Sum of Squares (SS)** | | **df** | **Mean Squares (MS)** | |
| | | **Between Groups** | 99.258 | | 2 | 49.629 | **3.15NS** |
| | | **Within Groups** | 3734.675 | | 237 | 15.758 | |
| | | **Total** | 3833.933 | | 239 | | |
| **2** | **Experimental Group** | **Subjects** | **Physics** | 80 | 17.81 | 3.64 | |
| | | | **Chemistry** | 80 | 17.15 | 3.50 | |
| | | | **Biology** | 80 | 19.60 | 3.33 | |
| | | **Source of Variation** | **Sum of Squares (SS)** | | **df** | **Mean Squares (MS)** | |
| | | **Between Groups** | 256.975 | | 2 | 128.488 | **10.53*** |
| | | **Within Groups** | 2891.588 | | 237 | 12.201 | |
| | | **Total** | 31.48.563 | | 239 | | |

**NS – Not Significant at 0.01 Level**

From the above table 2, it was observed that the F-values calculated among Physics, Chemistry and Biology of Control group and Experimental group students were not significant at Control group and significant at Experimental group students. Therefore no significant differences were observed among Physics, Chemistry and Biology of Control group and significant differences were observed in Experimental group students in the comparison. It may be concluded that there were no significant differences among Physics, Chemistry and Biology of Control group and significant differences in Experimental group students in learning science concepts. Hence the sub hypotheses "There would be no significant differences between the Posttest mean scores of Control group and Experimental group students among and within the branches of science" were accepted in Conventional teaching and rejected in Interactive Whiteboard teaching. Thus, it was concluded that Control group students have no significant effect among and within the performance of

Physics, Chemistry and Biology concepts in learning science after the experiment. On the other hand it was concluded that Experimental group students have significant effect among and within the performance of Physics, Chemistry and Biology concepts in learning science after the experiment.

**Findings of the Study**

1. Interactive Whiteboard teaching is effective in learning science.
2. The effect of regular method of teaching in learning science is also significant and effective in its own way.
3. The Control group students have no significant effect among and within the performance of Physics, Chemistry and Biology concepts in learning science after the experiment.
4. 10. Experimental group students have significant effect among and within the performance of Physics, Chemistry and Biology concepts in learning science after the experiment.
5. Conventional teaching has no significant effect in learning science.
6. Interactive Classroom teaching has significant effect in learning science.

**Suggestions to Further Studies**

1. The effectiveness of Interactive Whiteboard teaching may also be extended to experiment on different classes in learning science and other non – science.
2. The same study may be carried out to test the effectiveness of different subjects related to languages, literature and the like.
3. A longitudinal study may also be conducted to see the effectiveness of the Interactive Whiteboard teaching and Conventional teaching.

**Conclusion**

This piece of research helped the researcher to know more about the procedure of experimental research and also some awareness about Interactive Whiteboard classroom teaching. Above all these researches helped the researcher to gain a sense of achievement and self-satisfaction and this report may be helpful to the teachers, students and research scholars in their teaching learning situations. This may also be helpful to the policy makers and educationists to solve the problems of education. One of the best significant features of today's world is the developing momentum of scientific, technological, social developments etc. The revolution and unpredictability, human societies and organizations are inevitable to create dynamic and productive developments because of access to latest trends in the future.

According to Toffler, "only using innovative of change is for its direction, which can be spared the shock of the injury and to achieve a better future and more human".

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