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AN EXPERIMENTAL STUDY ON COMPARISON OF CONVENTIONAL TEACHING AND INTERACTIVE WHITEBOARD TEACHING IN DIFFERENT BRANCHES OF SCIENCE WITH RESPECT TO GENDER

Ramesh Bhavisetti

Research Scholar, Dept. of Education, Acharya Nagarjuna University, Andhra Pradesh, India.

Abstract

There have been tremendous changes in the life style of human beings which may be attributed to the contribution of science and technology. Its influence is being reflected in all productive endeavors. The contribution of science and technology has been experienced in almost all the spheres of human life including education. 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 comparison of Conventional Teaching and Interactive Whiteboard Teaching in different branches of 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 different branches of science. Objectives, Hypotheses, Tool, Sample, Method, Data Analysis, and Educational Implications are discussed as follows.

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

INTRODUCTION

Education provides stability in life, and it's something that no one can ever take away from us. Although many people like to rely on traditional methods of teaching, the possibilities that open when technology is brought into the classroom are endless. For one, access to education has been significantly broadened as a result, including a wide range of learning styles and degree options. The capacity of education technology to resolve the issues occurring in the traditional classroom education enabled it to pave a path to real-time and scientific teaching and learning methods by integrating, improving, and including appropriate

technological resources such as smart technology, computer-based training in education. The Interactive whiteboard is one of the innovations capable of replacing the conventional blackboard and chalk teaching method and the outdated overhead projector equipment in order to properly enhance the social-emotional and physical development of students.

REVIEW OF RELATED LITERATURE

Eng-Tek ong (2009) studied the effectiveness of smart schooling on student's attitudes towards science through survey method, comparing the participants comprised 775 form 3(15 years old) students from two smart schools. He found that the level of attitudes towards science of form 3 students who has participated in the smart school is statistically higher than that level of attitudes towards science of form 3 students 40 had participated in the main mainstream schools and discusses the findings in stream of parallel impact comparison within the available iterative and recommends that future student's should look into isolating specific elements of the smart schools that have direct impact on students towards science.

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.

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.

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.

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.

OBJECTIVES OF THE STUDY

1. To find and compare Pretest mean scores of 1. Control group 2. Experimental group students in three branches of science with respect to Gender.
2. To find and compare Posttest mean scores of 1. Control group 2. Experimental group students in three branches of science with respect to Gender.

HYPOTHESES OF THE STUDY

1. There would be no significant difference between the Pretest mean scores of Boys and Girls of Control group students in Physics.
2. There would be no significant difference between the Pretest mean scores of Boys and Girls of Control group students in Chemistry.
3. There would be no significant difference between the Pretest mean scores of Boys and Girls of Control group students in Biology.
4. There would be no significant difference between the Pretest mean scores of Boys and Girls of Experimental group students in Physics.
5. There would be no significant difference between the Pretest mean scores of Boys and Girls of Experimental group students in Chemistry.
6. There would be no significant difference between the Pretest mean scores of Boys and Girls of Experimental group students in Biology.
7. There would be no significant difference between the Posttest mean scores of Boys and Girls of Control group students in Physics.
8. There would be no significant difference between the Posttest mean scores of Boys and Girls of Control group students in Chemistry.
9. There would be no significant difference between the Posttest mean scores of Boys and Girls of Control group students in Biology.

10. There would be no significant difference between the Posttest mean scores of Boys and Girls of Experimental group students in Physics.
11. There would be no significant difference between the Posttest mean scores of Boys and Girls of Experimental group students in Chemistry.
12. There would be no significant difference between the Posttest mean scores of Boys and Girls of Experimental group students in Biology.

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, Chemistry & Biology was prepared by taking different areas to assess the following components:

1. nowledge
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 & Biology.

Objective-1

To find and compare Pretest mean scores of 1. Control group 2. Experimental group students in three branches of science with respect to Gender.

Hypothesis-1A

There would be no significant difference between the Pretest mean scores of Boys and Girls of Control group students in Physics.

Hypothesis-1B

There would be no significant difference between the Pretest mean scores of Boys and Girls of Control group students in Chemistry.

Hypothesis-1C

There would be no significant difference between the Pretest mean scores of Boys and Girls of Control group students in Biology.

Hypothesis-1D

There would be no significant difference between the Pretest mean scores of Boys and Girls of Experimental group students in Physics.

Hypothesis-1E

There would be no significant difference between the Pretest mean scores of Boys and Girls of Experimental group students in Chemistry.

Hypothesis-1F

There would be no significant difference between the Pretest mean scores of Boys and Girls of Experimental group students in Biology.

These hypotheses were tested by analyzing the Pretest mean scores of Control group and Experimental Group students. The effects were tested by finding Mean, S.D and Critical Ratio values of the scores of Conventional teaching and Interactive Whiteboard teaching and the results were tabulated in table-1.

Table-1

Comparison of mean scores of Boys and Girls in Control and Experimental group students with respect to different branches of science in Pretest

S.No	Group	Subject	Boys			Girls			SED	Critical Ratio
			N	Mean	S.D	N	Mean	S.D		
1	Control Group	Physics	17	15.41	4.02	63	15.54	3.91	1.08	0.12 NS
		Chemistry	17	15.12	3.97	63	15.22	4.00	1.09	0.09 NS
		Biology	17	16.12	4.21	63	16.51	4.23	1.16	0.34 NS
2	Experimental Group	Physics	30	15.35	3.95	50	15.59	4.01	0.92	0.26 NS
		Chemistry	30	15.29	4.03	50	15.25	3.87	0.91	0.04 NS
		Biology	30	16.53	4.30	50	16.62	4.26	0.99	0.09 NS

NS – Not Significant at 0.01 Level

From the above table 1, it was observed that the Critical Ratios calculated between the means of Boys and Girls in Control group and Experimental group students were not significant. Therefore no significant differences were observed between the means of Boys and Girls in Control group and Experimental group students in the comparison. It may be concluded that there were no significant differences between the means of Boys and Girls in learning science concepts. Hence the sub hypotheses "There would be no significant differences between Pretest mean scores of Boys and Girls of Control group and Experimental group students in Physics, Chemistry and Biology" were accepted. Thus, it was concluded that Control group students have no significant effect in the performance of Physics, Chemistry and Biology concepts in learning science with respect to Gender before the experiment. Likewise it was concluded that Experimental group students have no significant effect in the performance of Physics, Chemistry and Biology concepts in learning science with respect to Gender before the experiment.

Objective-2

To find and compare Posttest mean scores of 1. Control group 2. Experimental group students in three branches of science with respect to Gender.

Hypothesis-2A

There would be no significant difference between the Posttest mean scores of Boys and Girls of Control group students in Physics.

Hypothesis-2B

There would be no significant difference between the Posttest mean scores of Boys and Girls of Control group students in Chemistry.

Hypothesis-2C

There would be no significant difference between the Posttest mean scores of Boys and Girls of Control group students in Biology.

Hypothesis-2D

There would be no significant difference between the Posttest mean scores of Boys and Girls of Experimental group students in Physics.

Hypothesis-2E

There would be no significant difference between the Posttest mean scores of Boys and Girls of Experimental group students in Chemistry.

Hypothesis-2F

There would be no significant difference between the Posttest mean scores of Boys and Girls of Experimental group students in Biology.

These hypotheses were tested by analyzing the Posttest mean scores of Control group and Experimental group students. The effects were tested by finding Mean, S.D and Critical Ratio values of the scores of Conventional teaching and Interactive Whiteboard teaching and the results were tabulated in table-2.

Table-2

Comparison of mean scores of Boys and Girls in Control and Experimental group students with respect to different branches of science in Posttest

S.No	Group	Subject	Boys			Girls			SED	Critical Ratio
			N	Mean	S.D	N	Mean	S.D		
1	Control Group	Physics	17	15.35	4.00	63	15.87	3.97	1.09	0.48 NS
		Chemistry	17	15.41	3.87	63	15.38	3.90	1.06	0.03 NS
		Biology	17	16.35	4.21	63	17.05	4.07	1.12	0.62 NS
2	Experimental Group	Physics	30	17.59	3.89	50	17.87	3.59	0.86	0.33 NS
		Chemistry	30	16.53	3.95	50	17.32	3.39	0.83	0.95 NS
		Biology	30	19.65	3.16	50	19.59	3.40	0.77	0.08 NS

NS – Not Significant at 0.01 Level

From the above table 2, it was observed that the Critical Ratios calculated between the mean scores of Boys and Girls in Control group and Experimental group students were not significant. Therefore no significant differences were observed between the mean scores of Boys and Girls in Control group and Experimental group students in the comparison. It may be concluded that there were no significant differences between the mean scores of Boys and Girls in learning science concepts. Hence the sub hypotheses "There would be no significant differences between Posttest mean scores of Boys and Girls of Control group and Experimental group students in Physics, Chemistry and Biology" were accepted. Thus, it was concluded that Control group students have no significant effect in the performance of Physics, Chemistry and Biology concepts in learning science with respect to gender after the experiment. Similarly it was concluded that Experimental group students have no significant effect in the performance of Physics, Chemistry and Biology concepts in learning science with respect to gender 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 in the performance of learning science with respect to Gender after the experiment.
4. The Experimental group students have no significant effect in the performance of learning science with respect to Gender 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".

REFERENCES

Armstrong, V. & Barnes, S. & Sutherland, R. & S. Curran & Mills, S. & Thompson (2005), 'Collaborative research methodology for investigating teaching and learning: the use of interactive whiteboard technology' Review, Vol. 57, No. 4, November 2005.

BECTA (2006). Teaching interactively with electronic whiteboards in the primary phase. Retrieved October 18, 2009 from http://publications.becta.org.uk/download.cfm?resID=25918.

Betcher, C., & Lee, M. (2009). The interactive whiteboard revolution – Teaching with IWBs. https://epdf.tips/the-interactive-whiteboard-revolution-teaching-with-iwbs.html

BorGregorcic, Eugenia Etkina&GorazdPlaninsic (2017). A New Way of Using the Interactive Whiteboard in a High School Physics Classroom; https://www.researchgate.net/publication/313315495_A_New_Way_of_Using_the_Interactive_Whiteboard_in_a_High_School_Physics_Classroom_A_Case_Study.

Campregher S (2010). Effects of the Interactive Whiteboard (IWB) in the Classroom, Experimental Research in Primary School, Free University of Bolzano (Italy), Retrieved June 2011, from http://www.pixelonline.net/edu_future/common/download/Paper_pdf/ENT34-Campregher.pdf

Clarissa K. Cole (2012). A Literature Review Exploring the Effectiveness of the Use of Interactive Whiteboards on Teaching Basic Science Concepts to Special Education Students; https://repository.uwyo.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=1034&context=plan_b

Dr. Anita Menon (2015). Effectiveness of Smart Classroom Teaching on the Achievement in Chemistry of Secondary School Students; http://iasir.net/AIJRHASSpapers/AIJRHASS15-132.pdf

Dr.Kamalnayan B Parmar (2015). Incorporating the Smart Board for Smart Teaching; http://iejte.org/wp-content/uploads/2018/05/Vol-3-Issue-1-January-2015.pdf

Eng-Tek ong (2009). The effectiveness of smart schooling on student's attitudes towards science; http://www.ejmste.com/The-Effectiveness-of-Smart-Schooling-on-Students-Attitudes-Towards-Science,75255,0,2.html

Glover, D., & Miller, D. (2007). Leading changed classroom culture -- the impact of interactive whiteboards. Management in Education (Sage Publications Inc.), 21(3),21-24.

Jeyamani, P. (1991). The effectiveness of the simulation model of teaching through Computer Assisted Instruction (CAI).Fifth Survey of Research in Education. M. B Buch,. (Ed). New Delhi: NCERT. P 1375.

Sessoms, D.(2009). "Interactive Teaching and Learning", retrieved from http://www.edtech568.com//.htm on 17.03.2011

SMITH, A. (1999). Interactive whiteboard evaluation. MirandaNet. http://www.mirandanet.ac.uk/pubs/smartboards.htm (Accessed 22 January 2003).