

## **Effectiveness of Multimedia Approach of Teaching Science on Scientific Attitude and Achievement of Secondary School Students**

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### **ABSTRACT**

The process of teaching – learning can be made more interesting, more effective and child-centered if technology is made use appropriately. Many technology interface mediums like smart classrooms, blended learning and multimedia approach are helping teachers in this regard. Multimedia is one such medium through which teaching-learning can be made more effective, especially in teaching science where understanding concepts and applying it in day today life is more important. Children often find this difficult because they fail in understanding the concept and also practical exposure is very less. This problem is not only with children, but also with teachers as they sometimes find it difficult to make some abstract concepts clear to children. Multimedia, with all its components like text, graphics, sound, animation and pictures is one such media which can compliment teacher in their teaching and make teaching more effective and also helps in developing scientific attitude among children.

**Key Words :** Multimedia approach, Scientific attitude, Achievement

### **INTRODUCTION**

Teachers primarily require access to learning resources, which can support concept development by learners in a variety of ways to meet individual learning needs. The development of multimedia technology for learning offers new ways in which learning can take place in schools and also at home. Enabling teachers to have access to multimedia learning resources, which supports constructive concept development, allows the teachers to focus more on being a facilitator of learning while working with individual students. Multimedia with its illustrations, audio and video plays an important role in stimulating interest of students in learning, in increasing the classroom capacity, in broadening their vision, in developing student's thinking, in breaking the difficulty of teaching, in creating a pleasant classroom atmosphere, in teaching elements, in improving teaching effectiveness and demonstrating modern flavor and in many other positive aspects in the field of education. Interactive multimedia weaves five basic types of media into the

learning environment: (i) Text (ii) video (iii) sound (iv) graphics and (v) animation.

Scientific Attitude is the most important outcome of learning science. A person with Scientific Attitude is truthful, objective, open-minded, free from superstitious beliefs and has a rational thinking. On the other hand science is a subject that has utmost relevance to our life. In our day to day life it is the application of science that makes our life more easy and comfortable to live. Invention in science has made human life simpler. Learning Science brings precision in child's life and encourages being systematic and disciplined. Many Researches have proved that learning science helps a child to take proper decision and also enhances higher order thinking skills. It also helps in developing scientific attitude among children. Children enjoy learning science only when the teaching of science is made more interesting, when teaching becomes more practical oriented and when concepts are made clear. Many a time teachers find it difficult to explain the abstract

concepts. This can be overcome when science is taught through interactive multimedia instead of traditional method of teaching, making concepts in science clear, more interesting and more precise. Teaching through multimedia can be controlled, can be taught to a large group, it has rapid flexibility and it falls in line with high school science teaching requirements. Teachers in the classroom with the proper use of multimedia technology can stimulate student's interest in learning, enhances active classroom atmosphere.

### **Elements of multimedia in education:**

Multimedia learning environment involves a number of components or elements in order to enable learning to take place. They are: text, sound, video, animation and graphics.

#### **Text:**

Text acts as the keystone tying all other media elements together. It is a well written text that makes a multimedia communication wonderful.

#### **Sound:**

Sound is used to provide emphasis or highlight a transition from one page to another. Sound synchronized to screen display, enables teachers to present lots of information at once. Sound, if used creatively, becomes a stimulus to the imagination.

#### **Video:**

The representation of information by using the visualization capabilities of video can be immediate and powerful. Video can stimulate interest if it is relevant to the rest of the information on the page. Video can be used to give examples of phenomena or issues referred to in the text.

#### **Animation:**

Animation is used to show changes in state over time, or to present information slowly to students so they have time to assimilate it in smaller chunks. Animations, when combined with user input, enable students to view different versions of change over time depending on different variables. Animations are primarily used to demonstrate an idea or illustrate a concept.

#### **Graphics:**

Graphics provide the most creative possibilities for

a learning session. They can be photographs, drawings, graphs from a spreadsheet, picture or something pooled from the internet.

### **Importance of multimedia courseware:**

Besides being a powerful tool for making presentations, multimedia offers unique advantages in the field of education.

- Multimedia enables teachers to provide a way by which learners can experience their subject in a different way. The key to providing this experience is having simultaneous graphic, video and audio rather than in a sequential manner.

- Multimedia can provide an enhanced or augmented learning experience at a low cost per unit.

- It enables learning through exploration, discovery and experience.

- With multimedia, the process of learning can become more goal oriented, more participatory and flexible in time and space.

### **Need and importance of the study:**

The effectiveness of science education depends upon the extent of scientific attitude developed in students. Developing scientific attitude among students becomes the first and foremost priority of a science teacher. Achievements in the field of science and technology promotes the standard of living and well being of its people in the field of industry, education, engineering, medicine and so on. Therefore, science has become an integral part in the school curriculum. Learning science develops scientific attitude among students. This helps in reducing being subjective, affinity towards superstitious beliefs and all sorts of prejudice based on sex, caste and religion. It also develops democratic behavior, scientific attitude and higher order thinking skills like critical thinking skill and problem solving skill.

Teachers should help students to develop scientific attitude, inspire them to have a positive attitude towards learning science and inculcate scientific interest in them. Positive attitude towards learning science always makes a child appreciate new things and helps developing scientific attitude in him. Scientific Attitude largely includes open mindedness, objectivity, suspended judgement, rationality, aversion to superstitious beliefs and many more. Hence, it is very important for a teacher to motivate and inspire students with his teaching and develop scientific attitude in him.

Sometimes, students find difficult to study science due to its abstract nature. Even teachers sometimes find it difficult to make some science concepts clear, especially concepts like nuclear physics, periodic tables, preparation of food by plants and many more among children, blame it to the traditional method of teaching. Traditional method has failed to create interest in science to some extent, it curbs the curiosity of a child as it becomes teacher centered and it also creates fear among students. Multimedia, with its unique features like graphics, simulation audio and video can be blended with teaching science which helps students to understand the concept better and helps in retention.

Science and technology is fast improving and has laid a strong base in educational field also. Multimedia packages are readily available which provides graphic, video and audio presented in a sequential manner. It enables learning through exploration, discovery and experience. Multimedia teaching can be made use in teaching science by the teachers were abstract concepts can be taught effectively.

#### **Objectives of the study:**

- 1) To study the effectiveness of teaching science through Multimedia Approach on Achievement of class VIII students.
- 2) To study the effectiveness of teaching science through Multimedia Approach on Scientific Attitude of class VIII students
- 3) To find the differential effect of teaching science through Multimedia Approach on Scientific Attitude with respect to gender.
- 4) To find the correlation between Scientific Attitude and Achievement in Science when taught through Multimedia Approach.

#### **Hypotheses:**

- 1) There is no significant difference between the mean scores of Achievement in Science of students belonging to experimental group and control group of class VIII students.
- 2) There is no significant difference between mean gain scores of Scientific Attitude of experimental group and control group of class VIII students.
- 3) There is no significant difference in the mean gain scores of Scientific Attitude of boys and girls of class VIII students
- 4) There is no significant correlation between

Scientific Attitude and Achievement in Science when taught through Multimedia Approach.

### **METHODOLOGY**

A post-test experimental design was used in which one section of the school was treated as control group where traditional teaching method was applied and the other section was considered as an experimental group where Multimedia Approach of teaching was employed.

#### **Population and sample:**

Population for the present study comprised of the class 8 students of a private school of Mysore city. Random sampling technique was adopted for selection of the school. A school with medium of instruction as English was selected through random sampling. Two sections of 30 students of class 8th were considered wherein Section A was taken as control group and another section with 30 students of same class were taken as experimental group.

#### **Tools used:**

- The following tools were adopted for the study
- Multimedia courseware developed by the investigator for selected lessons in science for class 8 students.
  - Achievement test in Science constructed and validated by the researcher
  - Scientific Attitude Scale standardized by Dr. J.K. Sood and R.P. Sandhya.

#### **Analysis of the data:**

- 't-test' and Pearson Correlation were used to analyze the data.

### **RESULTS AND DISCUSSION**

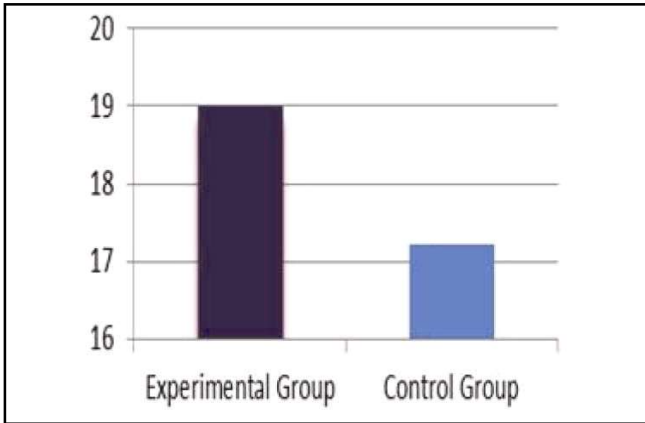
#### **Table to Test HYP 1 to 3:**

From Fig. 1 and HYP 1 in Table 1 it can be inferred that the obtained t-value 2.37 is greater than the table value at 0.05 level. Hence, the null hypothesis is rejected and alternate hypothesis is accepted. That is, there is a significant difference between the mean gain scores of Achievement in Science of students belonging to experimental group and control group of class VIII students.

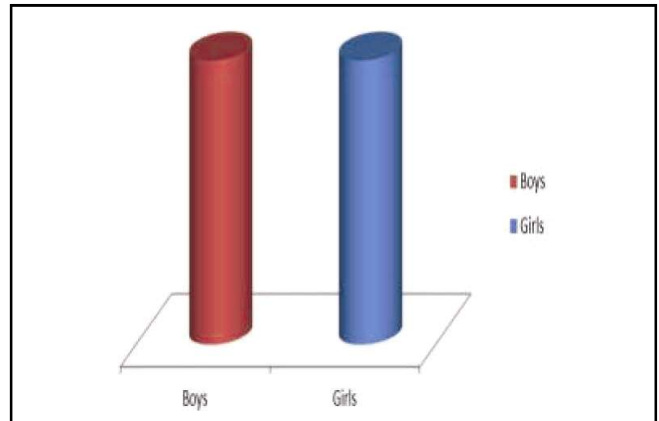
From Table 1 and Fig. 2 it can be inferred that the obtained t-value 4.64 is greater than the table value at

**Table 1 : Achievement in Science, Scientific Attitude of students belonging to experimental group and control group and Scientific Attitude of boys and girls of class VIII**

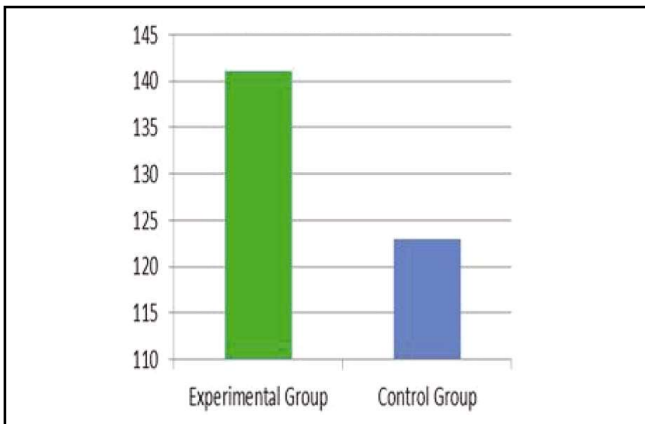
Source	Variables	N	M	SD	df	t-value	Significance	
HYP 1	Achievement	Experimental Group	30	19	2.93	58	2.37	Significant at 0.05 level
		Control Group	30	17.23	2.83			
HYP 2	Scientific Attitude	Experimental Group	30	141	14.34	58	4.64	Significant at 0.05 level
		Control Group	30	123	15.29			
HYP 3	Scientific Attitude	Boys	30	140	13.47	28	0.54	Not Significant at 0.05 level
		Girls	30	143	15.80			



**Fig. 1 : Achievement**



**Fig. 3 : SA of boys and girls**



**Fig. 2 : Scientific attitude**

0.01 level. Hence, the null hypothesis is rejected and alternate hypothesis is accepted. That is, there is a significant difference between the mean gain scores of Scientific Attitude of experimental group and control group of class VIII students.

From Table 1 and Fig. 3 it can be inferred that the obtained t-value 0.54 is lesser than the tabled t value at 0.05 level. Hence, the null hypothesis is accepted. That is, there is no significant difference between the mean gain scores of Scientific Attitude of boys and girls of class VIII.

**HYP 4:**

There is no significant correlation between Scientific Attitude and Achievement in Science when taught through Multimedia Approach.

From Table 2 it is found that there is a positive relationship between Scientific Attitude and Achievement in science as ‘r’ is significant at 0.01 level. Hence, the hypothesis is rejected and an alternate hypothesis is accepted. That is, there is a significant correlation between Scientific Attitude and Achievement in Science when taught through Multimedia Approach.

**Table 2 :**

Variable	N	SA	A	r value	Result
SA	30	1		1	Significant at 0.01 level
A	30	0.869662	1		

**Findings of the study:**

- Teaching through multimedia courseware is more effective than conventional method of teaching
- Teaching through multimedia courseware does not affect the gender. Both male and female students perform equally better when they are taught through multimedia courseware.
- There is a significant correlation between Scientific Attitude and Achievement in Science when taught through Multimedia Approach.

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