**Effectiveness Of Interactive Multemedia Approach For Physical Science On Secondary Level In Rural Area**

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**ABSTRACT:**

*The focus of the study examined the effect of Interactive Multimedia Approach on student achievement in general science as compared to traditional method of instruction. An experiment was conducted with 9lh class students of session 2017 studying Physical Science at Harijhama high School in rural area under West Bengal Board of Secondary Education (WBBSE) Multimedia program for the experiment was developed by the researcher using interactive multimedia mode of presentation covering two chapters from the textbook of Physical Science for secondary classes. Each mode comprises a text segment in Physical Science followed by multiple choice questions and immediate feedback.*

*Secondary school students studying science subjects constituted the population of the study. The students of 9th class of Harijhama High School, Harijhama, Purba Medinipur, were selected as sample of the study. Only students studying Physical Science as science subject were included in the sample. Sample students were assigned to two group’s i.e. experimental group and control group. Both the groups were equated on the basis of their achievement scores in previous examination in the subject of Physical Science. Each group comprised 20 students. There were two different treatment patterns applied during the experiment. Both the groups were taught through routine method by the same teacher. The multimedia approach was used as additional strategy for the experimental group. During the experiment period, the experimental group received the treatment of independent variable, i.e. multimedia approach whereby the experimental group was exposed to certain web-cites consisting of multimedia. In the mean while he control group was kept busy in other activities such as guided practice and independent practice. This was adopted to control the variable of time and to realize the primary objective of the study. The experiment continued for six weeks.*

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*In order to find out treatment effects, a teacher-made post-test was administered to the experimental as well as control group immediately after the treatment (teaching) was over. The purpose of this test was to measure the achievement of the students constituting the sample of the study. Final data were collected from 40 students, 20 from each group from each school.To evaluate the multimedia program in terms of students' opinion was administered to the experimental group students. Null hypotheses were tested by analyzing the data on achievement test. Paired t-test was applied to determine the significance of difference between the mean achievement scores of the experimental and the control groups.*

*The results revealed that the experimental group outperformed the control group in all the achievement areas i.e. overall, by levels of cognitive domain and by type of content. Achievement scores by the intellectual capacity groups of the experimental group were generally in accordance with their intellectual capacity, grade. Students liked the multimedia program and benefited for it. They found it better mode of instruction than the traditional method. Efforts are being made on the part of the government to expand computer facilities in schools. Expansion in computer literacy, a computer education and computer facilities warrants the need of interactive multimedia.*

1. **INTRODUCTION:**

The President of India, A.P.J. Abdul Kalam, formally launched the India-U.S. Edusat Network at Rashtrapati Bhavan on 8th December 2005.  His advocacy for a knowledge grid connecting [educational institutions](http://www.articlesbase.com/information-technology-articles/effectiveness-of-computer-assisted-instruction-in-reading-achievement-among-secondary-school-students-758089.html), research facilities and industries is the logical follow-up of a series of measures that have been undertaken by Anna University to ensure that tele-teaching reaches even to the remotest corners of the state.  This will enable the knowledge users to have access to high-performance computing environment, simulation systems, parallel/clustered servers, and super computer infrastructure from any end of the grid.

According to him, the whole purpose of education in a country was to develop and enhance the potential of human resource and progressively transform it, into a knowledge society.  Every Nation wants to produce students who ultimately become the knowledge workers in their own economy to be global citizens.  In the 21st Century, the need for competitiveness, in the field of Higher Education knows no bounds.  In the words of Dr.Kalam, "The competitiveness is powered by knowledge power.  Knowledge power is powered by innovation.  Innovation is powered by science and technology and technology is powered by resource investment".  (The Hindu, Friday, December 9, 2005).

In the 21st century the world is becoming more and more technology oriented. Thus the industrial age gave way to the information, an info-tech era which is as vital as air we breathe because this has brought changes to society, business, education and our human begins lives. Like Books, Blackboards, Laboratory equipments and Maps, a Computer also can serve teacher to communicate to the students.. A part from this the computer does some of the teacher’s work.

The age of computer is drawing in schools. It is a quite a jump from traditional teaching-reliance on book to the use of computer. In the context of learning, the rapid response to a learner’s action is of particular benifit as there can be quick reinforcement of good ideas which learner has and any misconception may be corrected. Interactive multimedia approach is based on the principles of programmed instruction. The major aim of the programmed instruction is to provide individualized instruction to meet special needs of individual learners. For this, it is necessary to have a huge device, which can store a gigantic amount of organized information that can serve to a great variety of educational needs with variety of educational levels; along with different styles of instruction and levels of learning.

Multimedia approach is relatively a new field in which the pioneer efforts were made around 1960s. A number of large-scale heavily funded multimedia projects have been launched and implemented since then. Multimedia is a common form of ICT in which repetitive type or flash card approach emphasizes rote memory and is used in all educational levels. Teachers use computers for instruction. Computer is just not like tools as black board or textbook. It is rather a device which provides students with interactive involvement with instructional materials. This is the advantage for which it is said that ICT contributes towards quality of education. Some of the benefits are-

1. Students may be given various degrees of control over their own learning.
2. Instruction can be tailored according to individual student's needs.
3. Feedback on student performance can be had and stored for further reference.

As the name implies, the basic interaction in Multimedia Approach occurs between the learner and the computer. It is self-paced and in many respects is very similar to programmed learning except that the instructional package is in the form of computer programme. Instruction usually proceeds step-by-step using a video display.

The learner answers questions and calls up the next learning sequence by using the computer terminal. The system is more interactive than programmed instruction because the learner can select from a wider range of options and can be required to make more complex decisions.

1. **OBJECTIVES OF THE STUDY:**

This study was designed to see the relative effectiveness of Interactive Multimedia Approach as a supplementing strategy on the academic achievement of secondary school students in the subject of Physical Science. The major objectives of the study were:

1. To compare the effectiveness of traditional method and Multimedia Approach on the Students.
2. To measures differences of performance in traditional method and Multimedia approach.
3. To compare the students achievements using Multimedia approach and Traditional method.
4. To find out the relative effects of Multimedia approach as supplementing strategy on the academic achievement in Physical Science.
5. To explore the difference between treatment effects for the students of high and low intelligence.
6. To investigate the difference between treatment effects for male and female students.
7. **HYPOTHESIS OF THE STUDY:**

To achieve the objectives of the study the following hypothesis were tested-

1. There is no significant difference between the mean scores of the students taught Physical Science with Multimedia approach as supplementing strategy and without Multimedia.
2. There is no significant difference between the mean scores of the high achievers and low achievers of experimental and control groups.
3. There is no significant difference between the mean scores of boys and girls students of experimental and control groups.
4. **METHODOLOGY OF STUDY:**

The study was aimed at investigating the effect of Interactive Multimedia Approach as a supplementing strategy on the academic achievement of secondary school students in the subject of Physical Science. As it was an experimental study and the purpose was to see the relative effectiveness of independent variable, i.e. teaching strategy, it was necessary to look into the various designs usually adopted in experimental research. The design of this study was ‘The Post- test Only Equivalent Groups Design’. In this design, subjects are randomly assigned to experimental and control groups.

* 1. **Population:**

The purpose of this study was to see the relative effect of Interactive Multimedia Approach as a supplementing strategy on the academic achievement students of class-IX in the subject of Physical science of secondary school, in the rural area in Purba Medinipur District under West Bengal Board of Secondary Education. Therefore, secondary school students studying Physical Science subjects constituted the population of the study for the academic session-2017.

* 1. Sample:

The study was conducted on a sample of 40 students of 9th class of the Harijhama High School in the rural area were selected as sample of the study. Sample students were divided into two groups, i.e. experimental group and control group. Both the groups were equated on the basis of their scores in previous examination in the Physical Science. Each group comprised 20 students.

**4.3 Tools for Data Collection:**

1. Interactive Multimedia Approach Program which made after expert, teacher and student opinions.
2. Pretest and Posttest which was consists Multiple Choice Question .Both have 20 marks and 40 minutes time duration.
3. **DATA ANALYSIS AND INTERPRETATION:**

The achievement scores of the sample were obtained as a result of the post-test. After obtaining the scores the lists were prepared for each group. The means, standard deviations, differences of means were computed. Significance of difference between the mean scores of both the groups on the variable of previous achievement and scores on post-test was tested at .01 and .05 levels by applying T-test.

***Table-1: Significance of difference between the mean scores of***

***students between Experimental and Control group in Cycle-I.***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CYCLE-I** | **N** | **Df** | **Mean** | **SD** | **SED** | **t-value** |
| **Experimental** | **20** | **38** | **16** | **2.33** | **0.73** | **8.21** |
| **Control** | **20** | **38** | **10** | **2.33** |

Table-1 shows that Table value oft for 38 degree of freedom is 2.71at 1% level and 2.02 at 5% level. The calculated value 8.21 is more than the table value of both at 1% and 5% level. So the difference between the two Means is significant. Therefore, the hypothesis is retained.

**CYCLE-I**



**1.1: Mean difference between Experimental and Control group**

**Fig 1.2: Difference between table value and obtained value of t**

***Table-2: Significance of difference between the mean scores of***

***students between Experimental and Control group in Cycle-II.***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CYCLE-II** | **N** | **Df** | **Mean** | **SD** | **SED** | **t-value** |
| **Experimental** | **20** | **38** | **10** | **2.86** | **0.90** | **4.44** |
| **Control** | **20** | **38** | **14** | **2.86** |

Table-2 shows that Table value oft for 38 degree of freedom is 2.71 at 1% level and 2.02 at 5% level. The calculated value 4.44 is more than the table value of both at 1% and 5% level. So the difference between the two Means is significant. Therefore, the hypothesis is retained.

**CYCLE-II**

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**Fig-2.1 Mean difference between Control and Experimental group**



**Fig-2.2: Difference between table value and obtained value**

1. **FINDINGS:**
2. Science teaching through interactive multimedia approach was equal effective for boys and girls.
3. There is significant difference between the performance of Experimental and Control group students.
4. The learners interact with the teacher more in Interactive Multimedia Approach.
5. Interactive Multimedia Approach strategies were superior to the traditional method of instruction and Multimedia Approach with Teacher Support System (TSS) was more effective than Multimedia Approach without TSS for under achievers.

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1. **RECOMMENDATIONS:**

In the light of the findings revealed and conclusions drawn from the study, the following recommendations are made-

1. Computer education should be enhanced in school to expose students to Interactive Multimedia Approach.
2. Government should provide the financial support to purchase computer systems and other computer peripherals.
3. There should be in-service seminars, workshops and training for the teachers on the use of computer in teaching their subjects specially Physics.
4. An experiment with the students from different cultural backgrounds such as urban and rural areas is needed to examine the effectiveness of computer-assisted instruction as a supplementary strategy.
5. An experiment with greater number of students from different secondary schools, representing a wider range of intelligence, be planned to examine the results of this study.
6. The teachers of different subject areas, especially from rural schools, are trained in the use of computers in the classroom.
7. The present study was conducted to see the effect of computer-assisted instruction as supplementary strategy in teaching of Elective Physical Science. Such studies are needed to be planned and conducted in other subject areas such as mathematics, Biology and social sciences.

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