

Effectiveness of multimedia instructional package for teaching secondary school students in terms of their selected cognitive abilities

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Abstract

This research paper is devoted towards experimental method of study with pre-test, post-test control group. Intervention of technology in the teaching learning process as a result of Educational Technology is the product of instructional and learning process. Use of Information Communication Technology (ICT) is the burning issues now a days in our teaching learning process. For many of us, the lure of computers is a powerful one. However, many of us also refrain from using computers for fear of failure. We want to hone computer skills, but are scared to make the effort because we lack those very skills. The experiment was made among Designed Multimedia used CBSE class students of VI, VII and VIII students as experimental group whereas the counter same as non-user of MM followed traditional method. The formulated objective of the study was "To Study the Effectiveness In Terms Of Students Achievement on Criterion Test". The formulated hypothesis was tested and it was found through the analysis of data percentile techniques was Developed Multimedia Instruct was found to be effective in terms of Achievement of the students on criterion tests. Seventy five percent students achieved more than sixty percent of marks. The finding also supported most of the studies related to Instructional Technology.

Keywords: Information Communication Technology (ICT), Multi Media (MM), Instructional Technology (IT), Learning Technology (LT), Criterion Reference Test (CRT)

1. Introduction

It is the responsibility of Government to provide quality education from elementary to higher level to their people by which development of Nation is possible. Education is the key by which social development is possible irrespective of any factors acts as barriers directly or indirectly for the development. In teaching learning process the core principle according to the objective to see the maximum output in the part of learner. The principle of instructional technology and learning technology are associated with the learners' achievement. Intervention of technology in the teaching learning process as a result of Educational Technology is the product of instructional and learning process. Use of Information Communication Technology (ICT) is the burning issues now a day in our teaching learning process. For many of us, the lure of computers is a powerful one. However, many of us also refrain from using computers for fear of failure. We want to hone computer skills, but are scared to make the effort because we lack those very skills. Too many of us, especially in the field of learning, are caught in this modern tug-of-war. Better understanding in the part of learners, applications of pedagogical issues related to learning process with respect to their developmental stages are the remarkable area for educational problems.

The basic objective of interactive multimedia material is not so much to replace the teacher as to change the teacher's role entirely. As such, multimedia must be extremely well designed and sophisticated enough to mimic the best teacher, by combining in its design the various elements of the cognitive processes and the best quality of the technology. With today's multimedia courseware, once a programme has been designed and built in with the appropriate responses, it

should be flexible and permit change and alteration. We shall look at the usage, advantages and disadvantages of multimedia in education and training. Some of the prototype multimedia lessons are also given at the end as examples. Multimedia is a term frequently heard and discussed among educational technologists today. Unless clearly defined, the term can alternately mean a judicious mix of various mass media such as print, audio and video or it may mean the development of computer-based hardware and software packages produced on a mass scale and yet allow individualized use and learning. In essence, multimedia merges multiple levels of learning into an educational tool that allows for diversity in curricula presentation. Multimedia is the exciting combination of computer hardware and software that allows you to integrate video, animation, audio, graphics, and test resources to develop effective presentations on an affordable desktop computer (Fenrich, 1997).

2. Rationale of the Basic Investigation

The basic objective and responsibility of any Government all over the world is to provide and avail quality and education for all from elementary level to higher education. In our teaching learning process the core principle according to the national goal how to see the maximum output in the part of the learners. The principle of Instructional Technology (IT) and Learning Technology (LT) are associated with the Teachers, Teaching Environments and Learners' achievement. Intervention of technology in the teaching learning process as a result of Educational Technology is the product of instructional and learning process. In both IT and LT are more potential by the use of Information Communication Technology (ICT) for resolving the burning issues teaching

learning process now a days. For many of us, the lure of computers is a powerful one. However, many of us also refrain from using computers for fear of failure. We want to hone computer skills, but are scared to make the effort because we lack those very skills. Too many of us, especially in the field of learning, are caught in this modern tug-of-war. Better understanding by the applications of pedagogical issues related to learning process of the learner in any stages are the remarkable area for the of educational problems. ICT in teaching learning process in both LT and IT trying to facilitates pedagogical issues with respect to other learning constraints of both learners and teachers. The emerging concept of media approach of teaching learning changed with the integration different media with single platform as Multi Media (MM) approaches of teaching learning. All the interventions of hardware and software approach of teaching learning environment lead by different theories behind the learning principles.

3. Rationale of the Study

There are so many studies conducted by different researcher in the field of Multimedia Instructional Package. Most of the studies are related with computer Aided Instruction (Multimedia Instructional Package) Those studies were conducted by Joseph (1984), Paul (1984) Joseph (1985) Ann (1986) Barbara (1986) Ellan (1986), Jay (1986), John (1986), Johson and Stanne (1986), Sue (1986), James (1986), Keig (1987), Mapsunota and Baba (1987), Millor (1987), Niemice and Walberg (1987), Wever (1988), Carol (1988), Hagh (1988), They reported that, Multimedia Instructional Package was found to be effective in terms of achievement Joseph (1994), Found that us of feedback of microcomputer to teach spelling at elementary school could improve the spelling scores at the begning of the study. In India, Shabji Pravaker (1988) developed software for teaching semi-conductors at plus 2 level. Himani Bhardwaj (1989) ^[8] developed Multimedia Instructional Package on microbes for class viii and Bhuban Mahapatra (1990) developed Software on chemistry for class ix students, and compared it with Traditional method. The main Findings of these studies were (i) Multimedia Instructional Package was found to be effective than traditional method and (ii) Seventy percent of student secured more than Seventy percent of marks.

Timolhy (1986), Breuni (1987) and Daine (1987) they have done their work for study the effect of Multimedia Instructional Package on cognitive domain. They found that, there is positive relation between Multimedia Instructional Package and development of cognitive domain of the learner. On the other hand Bhuban Mahapatra (1990) studies impact of Multimedia Instructional Package on Abstract reasoning of the students. There are many researches related with aspects also viz. Library management through computers, feedback through computer and so on. But in India it is still at experimental level.

Besides these measurements of some of the factor like reasoning, quite a few researches aimed to investigate the relationship between reasoning and achievement in various subject and / or prediction of academic success using reasoning as one of the predictors. Such studies have been conducted abroad by Segel (1932) Crawford (1936), Wolf (1939), Freidrick (1939), Beel (1940), Traxler (1941), Hessemier (1942), Goodman (1944), Crawford (1946),

Travers (1949) and in India by Rice (1922), Kamat (1939), Kulshreshtha (1956), All these studies revealed a significant correlation between reasoning and achievement in various academic subject and it was also found that, reasoning contributes significantly variance in the predication of academic achievement on almost all school subject.

Besides the treatments, there can be numerous other variables, which can influence the reasoning ability, independently as well as by interacting with the treatment, such as scientific attitude, higher mental ability, creativity etc. To find out the relation of different cognitive variables and their contribution towards the learning objectives through Multimedia Instructional Package is the present problem. Again through researcher has done Ph. D. in this area and to extend his doctoral work, with supporting to this area, problem has taken for this study.

4. Investigative Research Objective Hypothesis

1. To Study the Effectiveness In Terms Of Students Achievement on Criterion Test

The hypothesis formulated for the proposed studies are as under.

1. There will be no significant difference between mean achievement scores on criterion test with respect to class their classes.

5. Design

The present study was experimental in nature. Pre-test, post-test control group design was employed. 160 students were randomly divided into four these randomly divided groups were randomly assigned to the treatment. The treatment in the study had four levels, namely, (1). Unequal groups. The Traditional Method (i.e. readers of text book); (Group-I), (2). The Text Book + Multimedia Instructional Material Method (G-II.)

Each day, the topic started with one class with 40 minutes and followed next class if required. Thus, the total treatment duration was 40 working days under CBSE Schools personal contact programme. The investigator taught the all the four groups according to their treatment. The duration of teaching was different as per teaching methods. At the end of the all the topics with the help of Criterion Test developed by the investigator were administered to all the four groups. Before starting experimentation verbal intelligence test, study habit inventories, technological acquaintance and criterion reference test were administered upon four groups. At the end of the treatment four different Reaction scales and Criterion Reference Test were administered to the groups.

6. Tools

For majoring different variable standardized tools and tools developed by the investigator were used for the study. Details about different tools used in the study are given details caption wise as under;

6.1 Development of Criterion Reference Test (CRT)

Investigator was developed Criterion Reference Test (CRT) for measuring the learners' achievement taught through different methods to different groups. The test was consisted of 120 questions are objective types followed different pattern of questions. All the questions are objective type for making

the test more reliable. Knowledge, understanding, application, analysis, synthesis and evaluation level of cognitive variables is measured through the objective type of questions. Questions were covered fifteen topics which are integrated from Science subject of CBSE Schools, Class VI, VII and VIII level. In short answer type questions the answer were restricted within few sentences in order to make the scoring more objectives. Most of the questions were reasoning based.

7. Procedure of Data Collection

There were two groups in the study as stated early namely experimental group and control group. The procedure of data collection from both the groups is described here different captions. They were used their own time. There was no time limit for them. Again they were through additional activities also discussions assignment and library reference. On the other hand the time taken by the control group was according to the teacher. All the four schools were 5. K. m. apart from each other’s so there will be no effect on the interaction between the students of all the four schools. The students’ achievement was found to be significantly positively related with their intelligence. So the intelligence was controlled statistically and taken as covariate.

7.1 Data Collection from Experimental Group

As stated above two schools were selected for the experiment i.e. 1. Sammirton Higher Secondary School, Hoshongabad and 2. Kendriya Vidyalaya, Hoshongabad students of class VI, VII and VIII randomly assigned. Proper Instructions, orientation and other details were given before conducting experiment by the researcher. These schools were selected only for that, they have computer knowledge and about the use of computers in teaching learning process. In this school 28 and 30 computers were available for students. One hour and twenty minutes were provided for three days in a week for the experimentation. The teacher was present in the lab for solving their problem regarding the machines as well as package. Thrice a week, at least one hour the students could get a chance to interact with computers and they could use the package according to their wish. Inspire of this they were free to use the package, whenever the computers were available to them. The students were free to learn according to their own pace and three was no fixed time limit. More ever they could read a given information as many time as they wanted and they were also free to learn the contents according to their choice. After studying with computer 10 to 20 minutes were provided for interaction with teacher. In this interaction they generally solve their problems regarding computers and reference. With the consent of teacher and students discussion session were arranged. Difficulties regarding the teaching points raised by students were discussed. At the time of discussion library references were provided by the teacher which helped the learners in doing the assignments designed by the teacher. In the same way five chapters of science were taught to the students with Multimedia software package. After the completion of the experiment in all the three classes in two schools criterion test, was administered.

7.2 Data collection of Control group

Students of class VI, VII and VIII of MGM Higher Secondary School, Itarsi and Kendriya Vidyalaya, Itarsi were considered as the control group. These schools were followed the same

syllabus. These schools groups were did not receive any special treatment. Each of the chapter was taught by the investigator through the traditional method. After accomplishment of all chapters criterion tests were administered to the students of control group. In this way side by side intelligence test.

8. Effectiveness of Software Package

The effectiveness of Multimedia Instructional Package in terms of achievement was studied in terms of student’s performance on three criterion tests, prepared on five units of science. To study the overall achievement of the students, the average scores of each student was calculated. Obtained data was analyzed by computing percentiles. The results are given in the table1.1.

Table 1.1: Achievement scores of the students on different criterion tests and overall achievements (in percentage)

Percentile	C.T. -I	C.T. -II	C.T. -III	C.T. Overall performance
P ₉₀	80.60	82.60	85.44	78.06
P ₈₀	77.40	78.00	81.88	75.60
P ₇₀	74.20	75.70	78.44	73.20
P ₆₀	71.00	73.42	75.44	70.68
P ₅₀	66.84	71.14	72.62	68.00
P ₄₀	64.56	68.66	69.72	64.80
P ₃₀	62.28	63.32	66.80	61.60
P ₂₅	61.16	60.66	64.34	60.00
P ₂₀	60.00	57.00	62.76	56.00
P ₁₀	54.50	28.58	51.00	49.50
Mean	67.254	65.908	63.582	65.744

It can be seen from the Table 1.1 the mean performance on all the three criterion tests was above 65.744. The result reflected that, the students showed a good performance through developed Multimedia Instructional Package. Again Table 1.1 reveals that, 75 percent students achieved first division marks on criterion Test I, II, and III except criterion test I. Near about 30 percent students secured more than 70 percent marks. Distinction marks were obtained by twenty percent students on criterion test I, II, and III. Looking at the overall performance it can be seen that 20 percent students obtained distinction marks, and 75 percent students scored more than first division marks. Over all mean performance was 66 percent. Which was quite good? These results indicated the richness, which had been brought through the developed software. In this way the developed software was found to be effective in terms of achievement of the students on criterion tests.

8.1 Findings

It is found that students learning through multimedia learning environment secured overall performance with 20 percent are distinctions marks.

8.2 Discussion

1. Developed Multimedia Instruct was found to be effective in terms of :
 - a) Achievement of the students on criterion tests. Seventy five percent students achieved more than sixty percent of marks.

It was found Multimedia based instruction is effective in terms of students achievement because teacher able to describe

about the concept and learning principles with teaching effective are integrated and able to influence three levels of cognitive abilities. Both students and teachers are remaining active and abstract idea graphically represented in front of the students with concrete way. The principle of learning through interactive process and common discussion of the teacher student's constructivism develops and all the principles experimented through the developmental psychology and psychology of teaching learning helps through MM approaches of teaching resulted as maximum achievement of the learner.

9. Reference

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