Inclusion of Multimedia Technology as a Catalyst in Teaching Chemistry at Higher secondary level

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ABSTRACT

One of the most rapidly changing and exciting areas of education in the world today is the development of technology materials especially multimedia programs that run on personal computers. It proves that the age of computer is dawning. It is taking over the world swiftly and surely. It is a quite jump from traditional teaching reliant on text books to the computer age.

Technology has dominated a major place in the field of education. This article is the report of an experiment conducted for enhancing achievement in chemistry through multimedia. Two equivalent groups were drawn constituting experimental group and control group. Experimental group was taught using multimedia and the control group was taught using lecture method. The results of the post test administered to both experimental group and the control group revealed that the multimedia method has been found to be more effective than the conventional method.

Introduction

An appropriate educational technology in the hands of competent teachers can ensure better teaching learning process. The classrooms are overcrowded with heavy amount of syllabi the pupils are expected to gain knowledge to improve the level of understanding to develop the interests of pupils to enrich meaningful development of independent study habit and to create purposeful development of self confidence in learning an alternative process of teaching has to be adopted. Multimedia is found to be effective in stimulating interest of learners, motivating them to acquire knowledge and learn the difficult concepts in a simplified manner. In that sense

multimedia is a unique medium with features of quality audio visual recording and instant feedback.

In this article the investigator is comparing the conventional method with multimedia method. So it will be beneficial to the teachers, the students and the educational institutions. Since keeping all these in views, the investigator attempts an experiment to study the effectiveness of multimedia package for selected topics in in-organic chemistry for XI standard students in cuddalore region.

Significance of the study

It is impossible for the science teacher to use mere words to make the pupils understand the scientific principles clearly at all times for "a picture is worth a thousand words". In this context multimedia has become one of the best techniques of teaching in general and particularly the inorganic chemistry

Besides being a powerful tool for making presentations, multimedia offers unique advantages in the field of education. In teaching Chemistry instructor cannot make a nuclear explosion live in a classroom. Multimedia enables us to provide a way by which learners can experience their subject in a vicarious manner. The key to providing this experience is having simultaneous graphic, video and audio, rather than in a sequential manner. These are multimedia programs combining text, audio, video, and animate graphics in an easy-to-use fashion.

That role belongs to the learning needs of students. With multimedia, the process of learning can become more goals oriented, more participatory, and flexible in time and space, unaffected by distances and tailored to individual learning styles, and increase collaboration between teachers and students. Multimedia enables learning to become fun and friendly, without fear of inadequacies or failure

Objectives of the study

1. To develop a multimedia package for teaching Inorganic chemistry for XI standard students.

2. To study the effectiveness of multimedia approach over traditional method in teaching of inorganic chemistry for XI standard students.

Hypothesis

1. There is no significant difference between the achievements in chemistry of experimental group and control group in the pre-test.

2. There is no significant difference between the achievements in chemistry of experimental group and control group in the post-test.

Methodology

The present study is experimental in nature and has been designed on lines of parallel group, pretest, and post-test experimental design.

Sample

The study consisted of two parallel group's i.e. experimental and control groups each group consisted of thirty students of standard XI of Cuddalore district.

Tools used

Multimedia package to teach chemistry at XI STANDARD.

Achievement test.

Results and discussion

The main objective of the study was to find the effectiveness of the multimedia package of in-organic chemistry over the traditional teaching method on achievement in chemistry. To fulfill the objectives, the data collected was subjected to differential and inferential analysis. Null hypothesis were formulated and t-test was applied to ascertain them.

TABLE: 1

t - Value of Half Yearly Examination Course for the Experimental group and the Control group.

Scores	Control group			Experimental group			t-value	Remark
Half yearly examination scores	N	Mean	SD	N	Mean	SD	0.078	Not significant At 0.05 level
	30	77.8	4.91	30	77.9	4.94		

The two groups were matched equally on academic achievements scores in chemistry on half yearly examination and t-value for their mean and SD was computed to ascertain whether the students in the both the groups differed significantly.

Figure 1 shows that the obtained t-value of 0.078 is less than the theoretical t-value at 0.05 level of significance. Therefore it can be inferred that the control group and Experimental group do not differ in their achievement in chemistry before the treatment.

TABLE: 2

Mean and Standard Deviation of the Control group in the pre-test and post-test

Group	N	Pre-Test		Post-Test	
		M	SD	M	SD
Control group	30	7.4	1.28	11.3	1.68

TABLE: 3

Mean and standard deviation of the Experimental group in the pre-test and Post - test

Group	N	Pre-Test		Post-Test	
		M	**SD**	**M**	**SD**
Experimental group	30	7.5	1.28	22.03	1.3

Testing of Hypothesis

Hypothesis: 1

There is no significance difference between the pre-test in chemistry of the control group and Experimental group.

TABLE: 4

Mean, SD, t-value on pre-test in chemistry of control and Experimental group.

Category	No.of Students	Mean	SD	t-value	Significance
Control group	30	7.4	1.28	0.30	NS at 0.05 level
Experimental group	30	7.5	1.28		

Figure 4 shows that the obtained t-value 0.30 is smaller than the theoretical t-value for 0.05 level of significance; therefore the null hypothesis is accepted. The Experimental group and the control group do not differ in the pre-test in chemistry and the both the groups are equal before the treatment.

Hypothesis: 2

There is no significant difference between the post-test in chemistry of the control group and Experimental group.

TABLE: 5

Mean, SD, t-value on post-test in chemistry of control and Experimental group.

Category	N	Mean	SD	t-value	Significance
Control group	30	11.13	1.68	27.25	S at 0.01 level
Experimental group	30	22.03	1.3		

Figure 5 shows that the obtained t-value 27.25 is greater than theoretical 0.01 levels and hence the difference between the control group and the experimental group in the post-test is significant. Therefore null hypothesis is rejected. That is the experimental group has secured a highest score than control group. Therefore it can inferred that the multimedia package developed in the study by the investigator is more effective than the traditional method, in teaching in-organic chemistry at higher secondary level.

Education implications

Many students in higher secondary school have many difficulties in understanding chemistry. For this reason, students develop scientifically unacceptable Conceptions about many subjects or concepts in chemistry. Their knowledge of chemistry is therefore incomplete and incoherent .Many students, in fact, merely memorize chemistry concepts without actually learning .This situation is an indication of why some students never come to like chemistry. Conceptual understanding in chemistry is related to the ability to explain chemical phenomena through the use of macroscopic, molecular and symbolic levels of representation It is known that when relationships are formed between these three levels of representation, students understand and learn more in chemistry .In learning environments that include multimedia, students are able to form successful relationships between the three levels of representation in chemistry and thus learn the subject in a more effective and

meaningfully. Through multimedia, students rearrange their thoughts about chemical phenomena and processes and build meaningful mental models. With the use of these technologies within the educational environments, the mode of education switched from teacher-centered learning to student-centered learning. In student-centered learning, instead of remaining passive, students actively participate in the learning Using multimedia in teaching

Conclusion

Chemistry teachers must make much effort to create an ideal environment for teaching and learning. Including technological tools in the classroom will require teachers to employ different teaching techniques. Instead of making use of technological tools for a short-term educational program, however, students will benefit more from a longer period of learning. Designers of chemistry curriculum as well as chemistry teachers should take care to plan and implement activities that include technological tools in accordance with pedagogical objectives since the structure of such activities will be meaningfully effective in a student's learning process. In conclusion, multimedia presents significant opportunities in the near future for the chemistry education programs. They may also be beneficial and effective tool in the development of new methods and techniques.

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