EFFECTIVENESS OF MULTIMEDIA ON ACHIEVEMENT OF DISADVANTAGED STUDENTS IN INCLUSIVE SETTING

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ABSTRACT

The present experimental study was undertaken with two objectives in view (i) to develop a multimedia package for Class XI Biology and (ii) to measure the effectiveness of the multimedia package with special reference to socially, culturally and academically disadvantaged students in inclusive setting. Two matched groups of socially, culturally and academically disadvantaged students were constituted for the purpose of this experiment. The control group was taught through the traditional lecture method while the experimental group was taught using the Multimedia package. A pre-test was given to both groups before the experimental treatment. Then the experiment was carried out for a period of 30 days. At the end of the experimental treatment, a post-test was given to the students of control group and experimental group. The responses given by the students in pre-test and post-test, were the vital data required for analysis. The data thus obtained were analysed by using appropriate statistical techniques such as mean, SD and t-test. The obtained results showed that using multimedia was more effective than the traditional lecture method in teaching Biology and it enabled socially, culturally and academically disadvantaged students to improve upon their performance to a considerable extent.

INTRODUCTION

Education is an important issue of human rights as it is discussed in different declarations, covenants, treatises, constitutions and national acts. As the Committee on Economic, Social and Cultural Rights observes in the starting lines of its General Comment No. 13 "Education is both a human right in itself and an indispensable means of realizing other human rights". As an empowerment right, education is the primary vehicle by which economically and socially marginalized adults and children can lift themselves out of poverty and obtain the means to participate fully in their communities.

Education has a vital role in empowering women, safeguarding children from exploitative, hazardous labour and sexual exploitation, promoting human rights and democracy, protecting the environment, and controlling population growth. Increasingly, education is recognized as one of the best financial investments states can make. But the importance of education is not just practical: a well-educated, enlightened and active mind, able to wander freely and widely, is one of the joys and rewards of human existence. Education also plays an important role in the realization of the right to development and relevant economic, social and cultural rights. The marginalized section of the society including minorities, sexual minorities, women and migrants, scheduled castes, scheduled tribes etc can realize their social, economical and cultural rights through education. In view of above perceptions it can be clearly said that education is a mode of development. But inclusive education rather than only education is more important for promoting and achieving inclusive development.

Inclusive education is a process of strengthening the capacity of the education system to reach out to all learners and can thus be understood as a key strategy to achieve education for all. As an overall principle, it should guide all education policies and practices, starting from the fact that education is a basic human right and the foundation for a more just and equal society.

INCLUDING DISADVANTAGED STUDENTS IN REGULAR CLASSROOMS

Education in India has historically been the property of the few. Since educational development took place

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within the framework of a stratified social system it has always been focused on the needs of the privileged ones. India has made uneven progress in educating its society. The present day Indian society is, therefore, divided into various caste groups and among them the disadvantaged social group continues to remain in the lowest rung of the educational ladder. After independence, efforts are being made both by the Union Government as well as the State Governments to provide numerous facilities to the socially and culturally disadvantaged groups with a view to bring them on par with the various advantaged groups. Tribal people and nomadic people are marginalized sections of our society and they have their own unique culture. They have been cut off from the mainstream for a long time.

The socially and culturally disadvantaged children because of their socio-economic conditions find it hard to be in schools. Quality education is increasingly becoming more expensive over the years. These marginalized groups find it very difficult to afford such education. They mostly find themselves in residential schools run by the Government. Especially for them or in such schools that have hostels run by the Government nearby. This group comprises about 15% of the country's total population. Unclean occupations like scavenging, flaying, tanning etc. are most entirely engaged in by these groups. In such a caste based society, access and competencies are invariably possessed by the advantaged groups and so it becomes necessary to implement a special drive to admit students from the socially, culturally and academically disadvantaged groups in good schools and to devise some special instructional strategies to enhance their achievement in the courses they study.

NEED FOR THE STUDY

Nowadays we are passing through the age of information technology wherein knowledge explosion is taking place rapidly in every sphere and new media are being extensively used for transmitting information. Many are unable to keep pace with this phenomenon. This can be attributed to the lack of development of higher mental abilities, self-study habits, initiative on the part of students, etc. Thus multimedia approach is a combination of a variety of instructional materials and techniques for providing a series of learning experiences related to any subject.

Amongst many subjects in the higher secondary level, biology is a very important one. A biology student is engaged in a human activity that is directed towards seeking new knowledge about living things. A student tries to acquire new concepts of biology through practicing science or passing through the process of biology. India shall need specialists in the fields of medicine, health, agriculture and animal husbandry. The talent in these fields shall come from biology. Hence the investigation is mainly focused on higher secondary biology students.

Designing a package by the teacher includes the effect of message configuration and characteristics, effective combination of multimedia elements such as text design, visual effects and the use of audio, animation and graphics. Multimedia approach refers to the use of appropriate and carefully selected varieties of learning experiences which are presented to the learner through selected teaching strategies. This will reinforce and strengthen one another in such a way that the learner will achieve pre-determined objectives. Educational technology has rich potentialities and possibilities for accelerating the pace of human progress in general and for bringing astounding developments in various aspects of education. It has capabilities of bypassing several stages and sequences that are normal in the academic process. However, with the passage of time, the body of knowledge in different fields of learning increased and a tendency arose for experimental studies. Man's ever increasing knowledge of the world, new explorations on earth, growth of industry and trade necessitated the faster progress of a scientific outlook in biological science.

In the traditional classroom setting, the disadvantaged students are too inhibited to ask the teacher to clarify a concept or to get a doubt cleared. But, in multimedia, even if they don't understand something at the first attempt, they can understand the concept thoroughly by making use of the provision for playback. Besides, they can also take the software to their houses and listen to or view the instructional programmes according to their own convenience and thereby learn at their own rate without inhibition or the feeling of being backward in comparison with the fast learners. Chang

et al. (2008), Chai and Tan (2009), Lee and Guo (2009), Daniel (1999), Winter (1994), Stella (1993), Reddy and Ramar (1995, 1999) and Karuppasamy (2011) have studied and established the effectiveness of computer assisted instruction. But no study has been attempted with special reference to disadvantaged students. Systematic researches are, therefore necessary to develop a multimedia package so as to assess its effectiveness with reference to socially, culturally and academically disadvantaged students.

OBJECTIVES

i) To find out whether there is any significant difference in the performance of the control group and the experimental group students between pre-test and post-test.

ii) To find out whether there is any significant difference between pre-test and post-test in respect of the various categories of students i.e. socially disadvantaged students, culturally disadvantaged students and academically disadvantaged students.

iii) To find out whether there is any significant difference in the retention test performance of the control group and the experimental group students.

HYPOTHESES

i) There is no significant difference in the performance of the control group and the experimental group students between pre-test and post-test.

ii) There is no significant difference between pre-test and post-test in respect of the various categories of students i.e. socially disadvantaged students, culturally disadvantaged students and academically disadvantaged students.

iii) There is no significant difference in the achievement test performance of the control group and the experimental group students.

DESIGN OF THE STUDY

Experimental design is the blueprint of the procedures that enable the researcher to test hypotheses by reaching vivid conclusions about relationships between independent and dependent variables. In this experimental research, the investigator has chosen two equivalent-groups design for his study.

The pretest-posttest equivalent groups design is

$R\ O_1\ X\ O_2$ X gain = $O_2 - O_1$ O_1O_3 – Pretests

$R\ O_3\ C\ O_4$ C gain = $O_4 - O_3$ O_2O_4 – Posttests

In this experimental method two groups of subjects are selected. One of the equivalent groups serves as the control group in which the subjects are taught by the traditional method. The other group serves as the experimental group in which the subjects are taught using a multimedia package.

DEVELOPMENT OF A MULTIMEDIA PACKAGE

The title is formulated using adobe premier software and the supporting title deco software. The text for the multimedia package has been created using the above premier software. The animation pictures are downloaded from the web and photo galleries and converted into video clippings through a video editing software using the procured wizard software. The corrections are made using the Nero software and the researcher has been able to get the desired format.

SAMPLE

The sample for the present study comprises 50 XI standard students of St. Anne's Higher Secondary School in Cuddalore. Socially, culturally and academically disadvantaged students were identified on the basis of school records. These students were divided into two groups. Each group consisted of 10 socially disadvantaged students, 5 culturally disadvantaged students and 10 academically disadvantaged students.

TREATMENT FOR THE EXPERIMENTAL GROUP AND CONTROL GROUP

The experimental group was taught using the multimedia package. The control group was taught by the conventional method (i.e.) lecture method. Both the groups had the same number of students and they were given equal time for each session. The treatment was given for 30 days with a schedule of one hour per day for each group and no students were absent on those days. The treatment was given without any disturbances.

DEVELOPMENT OF ACHIEVEMENT TEST

The achievement test in science consists of 50 items from bio-geo chemical cycle, depletion of ozone and pollution. Among them 15 questions are on knowledge level, 20 questions are on understanding level and 15 questions are on application level. The questions are of multiple choice type having four alternatives. Students have to mark the answer as a or b or c or d. The total score of the test is 50. For each correct answer, the score is one. For each wrong answer the score is zero.

STATISTICAL TECHNIQUES USED

Statistical techniques serve the fundamental purpose of description and inferential analysis. The following statistical techniques were used in the study.

- Mean (M) and standard deviation (SD)
- 't' test for determining the significance of difference between the means of the two sub-groups.

ANALYSIS OF DATA

Table 1

COMPARISON OF PRE-TEST AND POST-TEST SCORES OF CONTROL AND EXPERIMENTAL GROUPS

Groups	NO	Pretest		Posttest		Calculated 't' Value
		Mean	SD	Mean	SD	
Control Group	25	33.42	5.33	34.46	7.17	0.17@
Experimental Group	25	35.44	6.17	45.44	6.17	4.33**

Note:

@ Not Significant at 5% level ** Significant at 5% level

There is a no significant difference between pre-test and post-test in respect of the control group students, whereas there exists significant difference between pre-test and post-test in respect of the experimental group students. The control group students could not show any marked progress in achievement in the post-test performance and so there is no significant difference in their performance between pre-test and post-test. On the other hand, the students of the experimental group have shown remarkable progress in the post-test.

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Table 2

COMPARISON OF PRE-TEST AND POST-TEST SCORES OF EACH CATEGORY OF STUDENTS

Note:

@ not significant at 5% level ** significant at 5% level

Groups	Category	No	Pre test		Post test		Calculated 't' Value
			Mean	SD	Mean	SD	
Control Group	Socially disadvantaged	10	34	3.58	34.30	3.3	0.07 @
	Culturally disadvantaged	5	30.55	2.28	32.45	2.28	0.62 @
	Academically disadvantaged	10	37.33	4.77	37.86	4.96	0.17 @
Experimental Group	Socially disadvantaged	10	36.32	4.24	46.05	4.30	7.20 **
	Culturally disadvantaged	5	29.8	1.72	37.44	3.03	9.87 **
	Academically disadvantaged	10	36.22	4.75	47.42	4.69	8.98 **

There is significant difference in the performance of students between pre-test and post-test in respect of each category of students in the experimental group, whereas there is no significant difference in the performance of the students between pre-test and post-test in respect of each category of students in the control group. Since the control group students were not subjected to the experimental treatment, they could not make any remarkable progress in post-test. On the other hand, all the categories of students in the experimental group have done better in the post-test than their counterparts in the control group.

Table 3

COMPARISON OF CONTROL AND EXPERIMENTAL GROUP STUDENTS IN THE GAIN SCORES

GROUP	N	Mean	S.D.	't' value	Remark at 5% level
Control Group	25	34.64	7.95	3.47**	Significant
Experimental Group	25	47.28	9.54		

** Significant at 5% level

There is significant difference in the achievement test performance between the control group and experimental group. The students of the experimental group have shown better performance in the achievement test than their counterparts in the control group. This table establishes that the applied strategy i.e multimedia has been effective in ensuring retention of the learnt concepts.

MAJOR FINDINGS

The major findings which have emerged from the study are as follows:

1. There is no significant difference between pre-test and post-test in respect of the control group students, whereas there exists significant difference between pre-test and post-test in respect of the experimental group students.
2. There is significant difference in the performance of students between pre-test and post-test in respect of each category of students in the experimental group, whereas there is no significant difference in the performance of the students between pre-test and post-test in respect of each category of students in the control group.
3. There is significant difference in the achievement test performance between the control group and experimental group.

EDUCATIONAL IMPLICATIONS

1. The results of the study have established that the applied strategy i.e., multimedia has been more effective than the traditional lecture method in teaching biology to various categories of students at plus one level. Only the degree of efficacy differs from category to category. So similar studies can be attempted in a wide range of schools to arrive at more dependable conclusions.
2. Identifying various categories of students in inclusive classrooms, such as socially, culturally, and academically disadvantaged students will enable the teachers to devise required remedial instruction to facilitate their learning. The teachers trained in this regard will be able to identify and classify the students into various categories and they will be able to accommodate their instruction to student diversities. Such training can be provided to the teachers at the district level by DIET or SSA and at the state level by SCERT.

3. Multimedia package also can be developed by NCERT and SCERT and even by commercial agencies since they are deemed to be more effective in teaching disadvantaged students. So teachers should be adequately prepared by means of orientation programmes or in-service training to play a supportive role in order to lead the various categories of learners towards optimum level of attainment in an inclusive setting.
4. Since the applied mode of instruction enhances the achievement of various disadvantaged students, it will diminish wastage and stagnation in our schools. So the teachers should be adequately prepared by means of orientation programmes. Such orientation may be given at DIET level also, so that awareness about multimedia packages can be developed among the primary school teachers.

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