International Journal of Psychosocial Rehabilitation, Vol. 24, Issue 10, 2020
ISSN: 1475-7192

Effect of Multimedia Learning Strategy on Learning outcomes of Students with Special Needs

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Abstract

Multimedia technology is a buzz word in the field of educational technology. The use of Multimedia technology has changed the scenario of providing teaching-learning experiences to students. The present study investigated the effect of Multimedia approach on learning outcomes of students with special needs. The study was delimited to hearing and speech impaired students (from mild to moderate). The present study was experimental in nature. Pre-test post-test design was employed to collect the data. The experiment was conducted for a period of 2 weeks. A sample of 60 students was selected by using a random sampling technique. An achievement test was used to test the learning outcomes of children with special needs. The control group was taught through traditional teaching methods and multimedia strategy was used to teach to Experimental group. The data from the achievement test was analyzed and a significant difference was observed between the learning outcomes of the Experimental group and the Control group when multimedia learning strategy was used to teach an experimental group. It was also observed that multimedia learning strategy is beneficial for both kinds of children with special needs (Hearing impaired and Speech impaired).

Keywords: *Multimedia learning, learning outcomes, children with special needs, hearing impaired children, speech impaired children*

I. Introduction

The term ‘Inclusive education’ has become a buzz phrase in the field of education of children with special needs.The path of inclusion of differently-abled children has progressed from segregation in specialschools to inclusion in regular schools.Inclusive education aims at the empowerment of all childrenhaving disabilities so that they can perform academic tasks properly. It also aims atdeveloping functional and academic skills among students. All the counties over have world have done tremendous efforts for proper organization andimplementation of support services in schools.It is recommended by several Commissions and Educational bodiesin India and all over the world that children with special needs or having any kind of physicaland mental disability, are required to provide inclusive education in normal classrooms.

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The children with special needs vary in severity. People with Autism, Down syndrome, Dyslexia, Blindness,ADHD, Cleft lips, or missing limbs all are included in the category of Special needs. Different methods of teaching are used to facilitate the learning of these students in educational settings. Students with speech and hearing impairments experience a lot of difficulties in the acquisition of different learning skills (problem-solving, critical thinking, reasoning ability, etc. Teachers must pay attention while selecting a method or strategy of teaching for providing learning experiences to children with special needs.

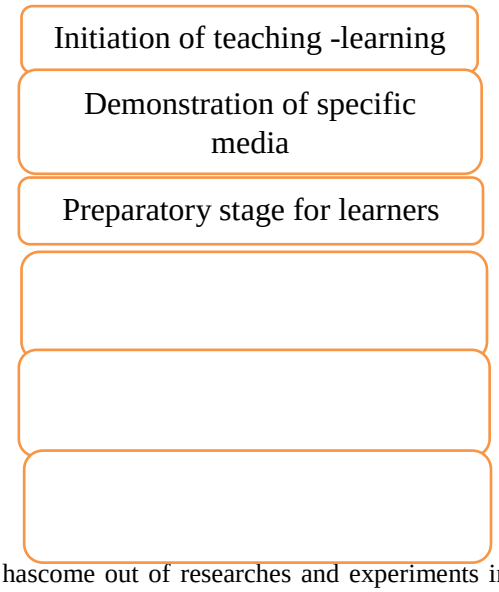
Every teacher aims to teach his students in the best possible ways by adopting proper ways and means for the effective realization of teaching objectives. Education as a system has some objectives planned for the process, for the realization of the variety of strategies, techniques and aids have been designed and devised by educational technologists Educational technology, the science and technology of teaching and learning, has evolved and devised various techniques, strategies, and approaches for both the teacher and learner to realize their teaching and learning objectives effectively. The use of a multimedia approach represents such a strategy that helps to improve the outcomes of the teaching-learning process.The use of multimedia and games in education is fun for children with special needs. They show their interest in the teaching-learning process when they are taught through animated videos and multimedia technology.

Packiam(1986), has referred to the use of a carefully selected variety of learning experiences.He focused on the idea to present learning material through selected teaching strategies, it will reinforce and strengthen one another in such a way that the learner will achieve predetermined objectives in an effective way (Khot, S. & Arvind, 2014). The multimedia approach uses several media, devices, and techniques in the teaching-learning process. This approach aims at providing meaningful learning experiencesto achieve predetermined objectives. But the success of using this approach lies with the selection of appropriate media according to the needs of students and only optimum use of it will bring desirable change in the behavior of learners. To improve the learning outcomes of students, some of the teachers have integrated technology with education. The integration of technology within the education system is called a multimedia approach. It is a pattern which led to the use of infinite applications of technology and computer in the teaching-learning process. Earlier sound cards and compact disks were used as media of technology in the education system, but the introduction of videos and animations has revolutionized the system of education.

The scope of multimedia technology is quite broad and it has infinite usage in every field of life. The Multimedia technique is one of the best techniques that are used in the field of education because it stimulates more than one sense of students simultaneously.Multimedia technology provides numerous stimuli to students which includes some elements i.e. texts, spoken words, graphics, animations, sound, video, etc. (Elshaaeikh, M. & Idris, M.,2013).

Procedure for using Multimedia approach

The use of multimedia in the teaching-learning has offered a variety of methods for providing information to students. Learning becomes more interactive by the use of different modes of multimedia: animations, sound, images, etc. The use of these modes provides an opportunity for teachers to represent information with more visual effects. The procedure of using a multimedia approach can be shown as follows:



The Multimedia approach hascome out of researches and experiments in educational technology that have been to improve the process of teaching and learning.

II. Review of literature

Thanks to multimedia technology that has changed the scenario of providing learning experiences to students.The use of multimedia technology arouses the interest of students and they receive brand new information. They can gain knowledge and information in a better way that was impossible in traditional classroom teaching. Semerci (1999) represented the idea that multimedia provides a richer learning environment for students(Oruc, S.2016). Incedayi,N. (2018) examined the impact of using multimedia technologies on the academic achievement of students in the Bakirkoy Final College. The results of the study revealed that animation usage producesa comparatively more significant increase in the academic achievement of geographic students.Sudana, M. & Rajendra.M. (2017) investigated the influence of interactive multimedia technology to enhance the achievement of students on practical skills in mechanical technology. The research findings of the study indicated thatsignificant differences exist between the mean scores of students in the experimental group and the control group. The findings of the study also indicated that multimedia as an instructional tool is quite effective to enhance the academic performance of students. Oruc,S.&IIhan, O. (2016) investigated the effect of the use of multimedia on students' performance: A case study of social studies class.They concluded that multimedia technique increased the academic performance, motivation, attention, and success of students in social studies learning compared to traditional classroom teaching.Khan, M. & Shah, I. (2015) conducted a study on the impact of multimedia-aided teaching on students' academic achievement and attitude at the elementary level. The results of the study indicated that multimedia- aided learning is more effective forthe cognitive development of students than the traditional method of teaching and the attitude of students towards science improves a lot by using a multimedia technique of teaching. Khan, T. (2010) conducted a study on the effects of multimedia on children with special needs. They selected a sample of children who are under the age of 11 years and who have either Autism or Down's syndrome. The results of the study indicated that theuse of the multimedia system is beneficial for the learning of those who have learning difficulties. The findings of the study also indicated that children with Autism got more benefitted from multimedia techniques than those who

have Down's syndrome. So, keeping in view the findings and results of the above-said researches, the present study investigated the effect of multimedia approach on learning outcomes of children with special needs. Based on the review of the literature, the following research objectives and hypotheses were framed.

2.1 Research Objectives

1. To studyifany difference exists in learning outcomes of children with special needs taught through multimedia approach and conventional teaching.
2. To study if any difference exists in learning outcomes of hearing and speech impaired children taught througha multimedia approach.

2.2 Research Hypotheses

1. No significant difference existsin the learning outcomes children with special needs taught through multimedia approach and conventional teaching.
2. No significant difference exists in the learning outcomes of hearing and speech impaired children taught through a multimedia approach.

III. Methodology

3.1 Measures

A self-prepared achievement test (grade VII) was used to study the learning outcomes of students. Test items were prepared according to the syllabi of the class.A totalof 60 items were prepared in the first draft of the achievement test. Then expert views were taken and a pilot study was conducted on 10 students and final testing of the draft (20 test items) was done on 25 students. The reliability of the achievement test came out to be 0.76. It shows that the achievement test is highly reliable. Multimedia package (CD and animated videos) was prepared to provide learning experiences to students.

3.2Sampling and research design

In the present study, experimental design with pre-test and post-test(Experimental group and Control group) of quantitative research technique was used.A sample of 60 students both males and females of VIIgrade was selected from two schools of Amritsar city. A random sampling technique was used to select the sample. The research was conducted over a period of 2 weeks. Interviews were conducted with 6 teachers of the schools to know about teaching strategy and content to be taught in the classroom that would be suitable according to the needs of students.Before conducting the study and implementation of the technique, consent from the principals of the schools was taken. Then the selectedsample was divided into two groups i.e. control group and experimental group. The pre-test of both groups on learning outcomes was taken. The Control group was taught through traditional teaching methods and multimedia learning strategy was used to teach the experimental group. Post-test of both groups were taken and scores were calculated by using descriptive and inferential methods of statistics. Mean scores, Standard deviation of each group was calculated and a t-test was employed to calculate significant differences among the groups. Tabular presentation of the distribution of the sample can be shown as follows:

Table 1.Distribution of sample (school wise and category wise)

Name of school	Hearing-impaired students	Speech impaired students
Ibadat inclusive school	14	12
DAV Red cross society school	16	18
Total	30	30

IV. Analysis and Interpretation

The following part presents the tabular and graphic presentation of data. Hypothesis wise explanation and interpretation of data are discussed as follows:

Hypothesis 1 No significant difference exists in the learning outcomes children with special needs taught through multimedia approach and conventional teaching.

Table 2T-test results of Experimental and Control group

Groups	**N**	**Pre-Test**		**Post Test**		**df**	**t-ratio**
		Mean	**SD**	**Mean**	**SD**		
Experimental	30	6.36	2.12	13.73	1.96	28	3.045
Control	30	6.3	2.39	7.66	2.53		

The above table shows the mean and SD of pre-test and post-test scores of experimental and control groups. It indicates the mean and SD of the experimental group of children with special needs(pre-test and post-test)are 6.36 (2.12) and 13.73 (1.96) respectively. In the case of the Control group, the pre and post-test mean and SD are 6.3 (2.39) and 7.66 (2.53) respectively.

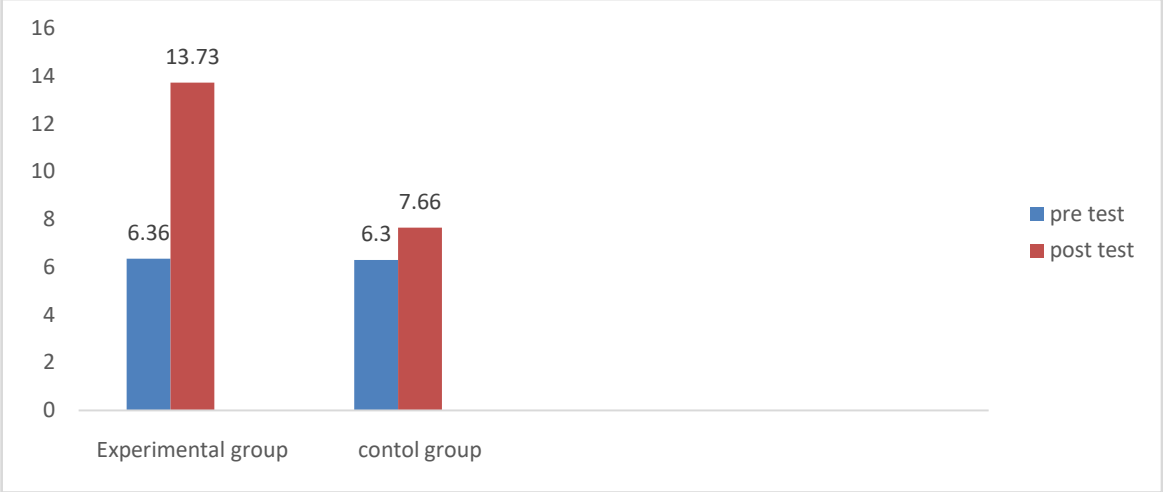


Fig 1. Mean scores of pre-test and post-test of Experimental and Control group of children with special needs

When pre-test and post-test scores of experimental and control groups are compared, a significant difference between the two groups is observed (t-value=3.045). when the mean values post-test of the experimental group and control group are analyzed, a significant increase was found as compared to mean values of pre-test (Experimental group means values $=6.36_{\text{pre-test}} < 13.73_{\text{post test}}$). Calculated t-value (3.045) is greater than the table value (2.76) at 0.01 and (2.05) at 0.05 level of significance as shown in table no.2. So, it is concluded that significant differences exist when students are taught through multimedia strategy. From the interpretation of data, it could be asserted that multimedia technology has a significant effect on the learning outcomes of the students with special needs.

Hypothesis 2 No significant difference existsin the learning outcomes of hearing and speech impaired children taught through a multimedia approach.

Table 3. T-test results of Hearing and Speech impaired children

Type of Children with special needs		**Experimental group**					
		Pre-test		**Post-test**		**df**	**t-ratio**
	N	**Mean**	**SD**	**Mean**	**SD**		
Hearing Impaired	30	6.2	1.77	13.43	1.88		
Speech Impaired	30	6.4	2.35	12.93	2.06	28	0.308

The above table (3) shows the mean and SD of pre-test and post-test scores of experimental groups. It indicates the mean and SD of the experimental group of children with special needs (hearing impaired) in the case of pre-test and post-testwere 6.2 (1.77) and 13.43 (1.88) respectively. In the case of the experimental group of children with special needs (Speech impaired) mean and SD of pre-test and post-test were 6.4(2.35) and 12.93 (2.06) respectively. Graphical presentation of the above table can be shown as follows:

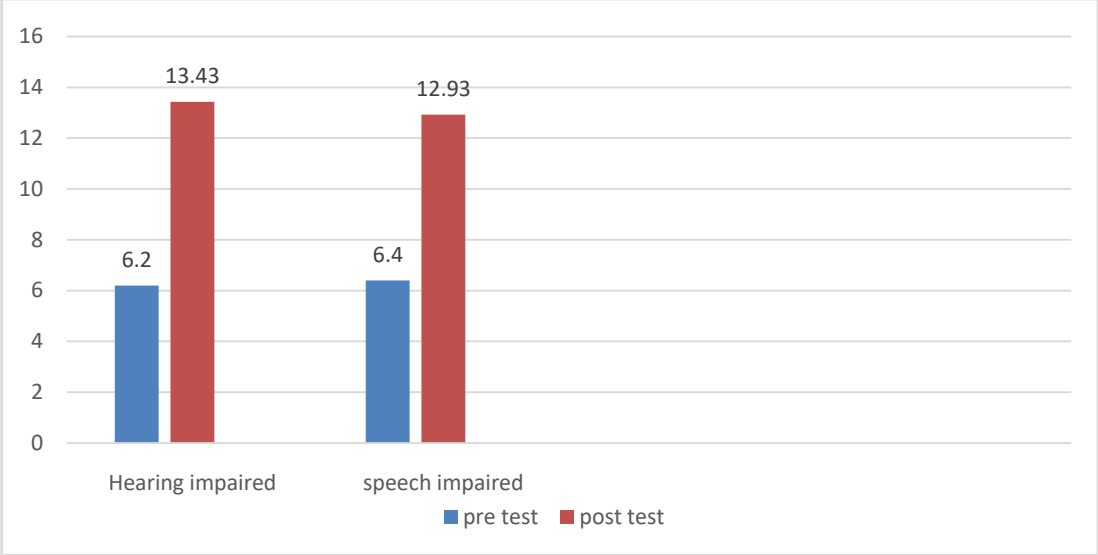


Fig no.2 shows mean scores of hearing and speech impaired children of Experimental group

When pre-test and post-test scores hearing impaired and speech impaired students of the experimental group are compared, a significant difference between the two groups is observed (t-value=0.308). when the mean values post-test of hearing impaired and speech impaired students of the experimental group are compared, a significant difference was observed. Calculated t-value (0.308) was greater than the table value (3.01) at 0.01 and (2.14) at 0.05 level of significance as shown in table no.3. So, it is concluded that significant differences exist between hearing impaired and speech impaired students of the experimental group when taught through multimedia strategy. From the interpretation of data, it could be asserted that multimedia technology is quite effective for both kinds of children and has a significant effect on the learning outcomes of the hearing impaired and speech impaired students.

V. Results and Discussion

This study examined the effect of multimedia on learning outcomes of children with special needs, no significant differences between pre-test scoresof achievement test of Experimental and Control group was found, it means that mean values of pre-test scores was highly similar to each other and when the multimedia technique was used to teach to the experimental group, a highly significant difference was observed between the two groups. Asignificant differencewas also observed between pre-test and post-test scores of Experimental groups which showedthe effectiveness of the multimedia strategy.Tariq khan (2010) completed a project on the effects of multimedia learning on children with different special education needs. The results of the project indicate that learning through multimedia is beneficial for those who have learning difficulties. Ted S. Hasselbring(2000) stated that computer technology has the potential to act as an equalizer by freeing many students from their disabilities. Computer technologyplays an important role in promoting the education of children with special needs.

In this study, the difference between the learning outcomes of hearing impaired and speech impaired students was also studied. When pre-test and post-test scores of both groups (Hearing and speech impaired) were compared, it was observed that multimedia strategy was beneficial for both because a significant

difference was observed between the mean values of pre-test and post-test scores. It has been also observed in the study that multimedia technology not only increases the learning outcomes of students rather it also enhances the interest of students in the teaching-learning process and it acts as an instrument to develop confidence among them.Marco de Groen (2017) conducted a study on the impact of Multimedia in education for children with special needs and concluded that by using multimedia in education, children with special needs learn in a better way. It gives them a huge boost to recover from their challenge greatly.

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