Haripur Journal of Educational Research, Vol. 1, Issue 1, 2017

Scientific Application of Audio Visual Aids in Teaching Science

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Abstract

Present study was designed to examine the effectiveness of using low cost materials as audio visual aids (A.V. Aids) on academic achievement of students' at elementary level. Total 70 students of class 5th from (Govt. Model High School Vehari, in Punjab) were included in the sample. It was an experimental study which followed pre-test post-test design, control design. Students were divided in two groups on the basis of their score in pre-test; experimental and control. Thirty five students were allocated to experimental and control groups each. The experimental group was provided the treatment by using low cost material as A.V. Aids for two months. The researcher himself taught the experimental group of students and the results showed positive effects of A.V. Aids on students' academic achievement. It was recommended that low-cost A.V. Aids may be used on regular bases for batter academic achievement of students of mixed abilities. It was also recommended that teachers may use of A.V. Aids not only in the subject of science but in all other subjects as well.

Key Terms: Audio Visual Aids, Teaching, Science, Elementary students, Academic achievement

Introduction

Students come to school to learn and increase their knowledge. The use of low cost materials helps teachers to increase interest of the students and make the concepts clear. When a teacher uses low cost material, students show interest in teaching learning process. A psychiatrist William found that individuals learn or remember 10% of what they read, 20% of what they hear, 30% of what they see, and 50% of what they see and hear. Low cost teaching aids are most effective apparatus for increasing learning. These types of teaching aids save the time of the teacher and help increase interest of the students. These aids enhance the intellectual capacity, thinking and feelings (Schwarz & Lutz 2004). Low cost materials as A.V. Aids are important especially at primary level. Low cost materials enrich the mental level of the

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students in understanding the various basic concepts and principles (Abbas, 2003). Successful education depends on three aspects, teacher, materials and method of teaching. The locally prepared A.V. Aids can fulfill the needs of both; teachers and students. This way conducive educational environment can be developed for the learners (kumar, 2014). The teacher educators should focus on the designing and making of low cost no cost instructive apparatus from the easily accessible objects. The routine waste material can be used with little efforts by the teacher to make his lesson effective and interesting (Akbar, 2004).

The present study was designed to examine the effects of low cost material as audio visual aids as teaching strategy on academic achievement of students in the subject of science at primary level in district Vehari. It was also an intention to analyze effects of low cost material as audio visual aids as teaching strategy on academic achievement of students having mixed abilities. In order to follow the right track of research, two hypotheses were also established. There will be no significant difference in the academic achievement of students who will be taught through A.V.aids and those who will not be taught through A.V. aids. Similarly, there will be no significant difference in the academic achievement of students who will be taught through A.V.aids and those who will not be taught through A.V. aids

Review of Literature

Science is not just confined to reading or hearing. It holds students in laboratory work as well, in order to test ideas and develop understandings. Hence, science-teaching plan is incomplete without scientific experiences (Ewers, 2001). The literature on science education is the outcome of number of research activities. Individual, home, school, teacher all should be cooperative in enhancing the achievement of the students' scientific knowledge (Esiobu, 2005). Experiment-based science learning is effective for students as well as teachers. They must be given proper time resources and facilities to promote

their critical, observations. Encouraging environment should be developed for observations and experiences. Science is deals with the understanding of the universe. These understandings help man to know more about the world (Ogunleye, 2002). Science is a capable resource for increasing logical thoughts. It is necessary to encourage students to develop systematic modes of explanations and modeling (Acher, Arca & Sanmarti, 2007).

Low-cost instructional resources give clear instructions about the objectives (Ibeneme, 2000). Chinese accomplished that: I hear; I forget, I see; I remember, I do; I understand. An old Chinese proverb goes like one seeing is more worth, a hundred words. Low cost material as A.V. Aids helps students think critically. It accelerates comprehension. The learners of 21st century have the opportunity of using computers in class room. Children show great interest to watch educational movies than to read book (Yunus, Salehi & John, 2013). Low cost material as audio-visual can make lessons easy to grasp the lesson (Mathew & Alidmat, 2013). Learning has two sides; positive and negative. To achieve the positivity, a teacher incorporates low cost materials as A.V. Aids; pictures, poster, graphics, videos, charts, flash cards etc. in the teaching (Asokha, 2009). For effective teaching, teachers make the subject exciting by relating it to the real world. Low cost resource is very important and effective in the process of meaningful learning (Ngozi, Samuel & Ameh, 2012). Low cost materials as audio visual aids can be useful when we explain the meanings and concepts of the things in a concrete way, a helping tool for teaching (Natoli, 2002). Low cost materials as audio-visual aids are very helpful teaching, instructional as well as promotional aids. They provide experiences which cannot be easily provided otherwise (Mcnaught, 2007).

The significance of audio-visual tools in the educational procedure is moderately apparent (Mishra and Yadav, 2013). Low cost materials as audio visual aids make presentations more attractive. Visual aids help the student to use senses timely. One picture can bring out countless words. If a teacher uses

the low cost material, the lesson can be made full of interest (Kate, & Marquez, 2011). Visual-aids similar to pictures, models and charts help the learners to understand the conceptual thoughts of the content (Yunus et al., 2013). If a teacher uses the audio-visual aids, it attracts students towards topic by relating the topic to the life (Çakir, 2006). Individuals gain knowledge of science better if low cost resources are offered during teaching learning process (Ozaslan & Maden, 2013).

Research Methodology

The study was experimental and pre-test post-test research design was applied. Students of class 5th were selected as sample from (Govt. Model High School Vehari, in Punjab). They were 70 in number. In order to minimize the effects of other variables on results, students of same class were selected who were sharing almost equal socio-economic status, academic qualification, living standard, parental income, age, teachers etc. A test was designed and validated through experts. It was pilot tested to check its reliability.

Test was of multiple choice items, developed from the chapters which were already taught to the students. These chapters were; classification of animals, Micro organisms and seed and its germination, from textbook of general science of grade 5th. It was administered as pre-test and scores were placed in ascending order. The students were randomly divided into two categories afterwards. One was called experimental group and the other was named as control group. Each has 35 students comprised of high achievers, mediocre and low achievers. Experimental group was provided the treatment by using low cost material as A.V. Aids for two months. The lesson plans were designed on regular bases. Low cost material as audio visual aids were used to engage the students in teaching and learning such as; in chapter four (kinds and causes of pollution) pictures of land, water and air pollution, polluted water, pesticides, waste dumping, waste garbage, petroleum jelly, pictures of burning of tires etc. (Boards, Pictures, Flash Cards, Graphs, Diagrams and real objects.

In chapter five (Matter and its States); charts, chalk-board diagrams small bouncing balls, dry peas, plastic tray and plastic sheet, ice, ice cubes, plastic bowl, stainless steel glass etc., were used.

In chapter six (Friction); book, ball, wooden block, glass sheet, oil, eraser, pencil, polystyrene cup and physical balance were used. In chapter 'inertia'; cupboard, book, card, 5 rupee coin, jar or glass and paper sheets, were used. In 'simple machines'; spring balance, thread, knife, steel ruler, apple, meter rod, weights, wedge, were utilized. To teach the concepts like (Luminous and Non-Luminous Objects); candle, match box, book, wooden piece, shoe box, torch, tissue papers, piece of hard card board, a clear wrapping paper, mirror, white ball, three small wooden piece, scotch tape, were used. All these things were developed by the teacher. The researcher himself taught the experimental group of students in Govt. MHS Vehari. The preferred lessons were taught by the teacher using proper low cost material arranged before the class. Home assignments were given in the form of activity to increase their learning.

The second instrument was post-test. The items of the post test were also of multiple choice items. It was based on three chapters; pollution and its causes, matter and its sates and friction and simple machine. These three chapters were taught by the researcher himself to the students during the experiment. At this stage once again expert science teachers were consulted for the validity of the tool. According, changes in options, stems or clues final version of test was made. It was piloted resulting in test reliable with coefficient 0.78. It was administered to the students to see the effects of using low cost material as A.V. Aids on academic achievement of students.

Data were collected in two phases, initially through pre-test before the start of experiment and in the second phase after completion of experiment through post-test. Data were analyzed through SPSS with mean scores, standard deviation and t-value.

Results and Discussion

Difference of Boys' Achievement in Pre-test

Category	N	Mean	SD	t-value	p-value
Experimental	35	25.03	8.58		
Control	35	25.37	8.00	-0.173	0.864

Level of significance = 0.05

The table shows that for experimental and control groups N= 35, mean scores 25.02 and 25.37, standard deviation 8.58 and 8.00 respectively t value -0.17 and significance of (2-tailed) is .86. The table revealed that there was no significant difference in achieved scores of control and experimental groups of boys in the pre-test. In the light of this result, it was hard to reject the hypothesis.

Difference of Boys' Achievement in Post-test

Category	N	Mean	SD	t-value	p-value
Experimental	35	35.51	11.85		
Control	35	28.05	9.60	4.44	0.00

Level of significance = 0.05

The table shows that experimental and control group of boys, N= 35 mean scores 39.51 and 28.05 standard deviation 11.85 and 9.60, respectively t value 4.44 and significance of (2-tailed) is 0.00. The table revealed that there was a significant difference in both the groups (control and experimental) of boys in the marks obtained in the pre-test. In the light of this result, it was hard to accept the hypothesis.

Difference of High Achiever Boys' in Post-test

Category	N	Mean	SD	t-value	p-value
Experimental	17	48.88	6.92		
Control	17	35.58	7.73	5.278	0.00

Level of significance = 0.05

The table indicates that high achiever boys of experimental and control groups each equal students, N= 17, mean scores 48.88 and 35.58, standard deviation 6.92 and 7.73, respectively t value 5.27 and sig. (2-tailed) is .000. The table showed that there was a significant difference in the mean scores of boys high achievers of experimental group and control group in the post-test. In the light of this result, it was hard to accept the hypothesis.

Difference of Low Achiever Boys' in Post-test

Category	N	Mean	SD	t-value	p-value
Experimental	18	30.66	8.09		
Control	18	20.94	4.23	4.52	0.00

Level of significance = 0.05

The table shows that low achiever boys of experimental and control groups equal student each group, N= 18, mean scores 30.66 and 20.94 standard deviation 8.09 and 4.23, respectively t value 4.52 and significance of (2-tailed) is .000. The table presented that there was a great distinction in the mean scores of experimental group boys' low achievers and control group boys low achievers in the post-test. In the light of this result, it was hard to accept the hypothesis.

Discussions and Conclusions

The present study was conducted to see effects of low cost materials on students' academic achievement at primary level. After analysis of the scores, treatment through low cost material as A.V. Aids is more significant than teaching without low cost material. The students of experimental group showed better results after treatment to compare with students of control group. The same results showed the significance of low cost material as practical as compared to the verbal instructions (Percival, 2014). After the treatment, results indicated low cost material improves the performance of the students at primary level. The confirmation of this can be found in a number of studies like Kochhar (2004) advocated that audio-visual aids bring interest in lesson both for students and teachers. A.V. Aids play an important role in

diverting the attention of the student towards learning and studies (Kochhar, 2004). The results showed that lesson delivered in a proper way or method, affects the learning of the students. The present study proved that low cost material can improve the academic achievement of the students at primary level. Low cost material as A.V Aids improves academic achievements of students (Mcnaught, 2007).

Recommendations

The following recommendations were made on the bases of the conclusions.

It was recommended that low cost material as A.V. Aids should be used by the teachers where possible or where they find it helpful in subject of Science. The use of Low Cost Material as A.V. Aids proved fruitful for the students of primary level in subject of science, therefore, it was recommended that Low Cost Material may be used as teaching strategy in subject of Science at primary level. The teachers may use low cost material as A.V. Aids to increase the interest of the students especially in the subject of Science. It was recommended that teachers may be appointed by the Government who has capability of teaching science at primary level. It was recommended that head teachers of primary schools may allocate teaching of science subjects to teachers who possess science background in their academics. It was also recommended that teachers, who are teaching science subject, may be motivated, encouraged and appreciated in developing their capacity to design and use low cost material as a teaching strategy in their classrooms. It was also recommended that use of low cost materials may be encouraged to apply in all subjects in general and for the teaching of science in particular. It was recommended to guide teachers in using low cost material by the Government. It was recommended that Low cost and helping material as A.V. aids may be prepared locally by the school teachers and students.

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