

## **AN EXPERIMENTAL STUDY ON THE STUDENTS OF SECONDARY LEVEL: EFFECTIVENESS OF AUDIO-VISUAL AIDS IN TEACHING LIFE SCIENCE**

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### **Abstract**

Main purpose of this experiment to study the effectiveness of Audio-visual aids in teaching life science among the students of secondary level. The participants of this experiment were 64 (29 girls and 35 boys) secondary level student of West Bengal Board of Secondary Education. The instrument for data collection was a 14 items "Teacher made Achievement Test". Topic of achievement test was "flower". Students were divided into two groups. Pre and post-tests were taken upon both groups. Data was analyzed by using ANOVA at 0.05 level of significance. The result of this experimental study revealed that using audio-visual aids in teaching life science at the secondary level is more effective than without using audio-visual aids.

### **Keywords :**

Audio-visual teaching aids, life science teaching, TLM

### **Introduction**

Effectiveness of teaching-learning process does not depend only on teacher but also upon the different types of equipment available in the class room and our surrounding environment. Those different types of equipment are known as 'teaching and learning' materials or TLM or audio-visual aids. The TLM makes teaching-learning process more interesting and more effective.<sup>1</sup> Edgar Dale said that "Audio-visual are those devices by the use of which communication of ideas between persons and groups in various teaching and training situations is helped. These are also termed as multi-sensory materials." According to Kothari Commission (1964-66), "the supply of teaching aids to every school is essential for the improvement of the quality of teaching. It should indeed bring about an educational revolution in the country." The NPE, 1986 which was modified in 1992 had gave a great stress on the use of teaching aids, especially improvised aids, to make teaching-learning more effective and more realistic. But still now teachers in India are following the traditional way of teaching. This traditional method does not provide teaching aids. Teachers are not ready to use innovation nor they are trained enough to use the TLM or Audio Visual aids, for making their teaching more interesting and more effective. Good teaching aims at effective communication and appropriate learning outcomes.<sup>2</sup> For realizing both these, different types of aids and materials, such as chart, models, television and so on, are used. In this paper, I not

only use the term 'Audiovisual aids', but 'TLM', 'Teaching aids', 'Instructional aids', 'Audio aids', 'Visual aids' as well.

Audio-visual aids or teaching aids or learning devices are added devices that help the teacher to clarify, establish, co-relate and co-ordinate exact concepts, and help him to make learning effective, concrete, interesting, inspirational, meaningful and vivid. The basic assumption underlying Audio-visual Aids is that learning-clear understanding-stems from sense experience.<sup>3</sup> Audio-visual aids provide significant benefits in informative learning, retention and recall, thinking, interest, activity, better assimilation, imagination, personal growth and development. In the words of Edgar Dale, "Because audio-visual materials supply concrete basis for conceptual thinking, they give rise to meaningful concepts enriched by meaningful association, hence they offer the best antidote for the disease of verbalism."

Some of the important values of the proper use of audio-visual aids or teaching aids are given below:

Providing motivation for learning, providing freshness and variety, appeal to students of various abilities, encourage active participation, give needed reinforcement, widen the range of experiences, assure order and continuity of thought, improve the effectiveness of other materials, helpful in attracting attention, saving of energy and time, best motivator, encouragement to healthy class room interaction, positive transfer of learning and training, gives vividness, spread of education on a mass scale, promotion of scientific temper, positive environment for creative discipline etc.<sup>4</sup>

### **Need for the Study**

In the present technological age, the full potential of audiovisual aids needs to be explored by the science teacher for more effective science teaching. As most of the learning takes place through the sense, audio-visual aids can help ensure effective learning, breaking monotony of the classroom sense.<sup>5</sup> My paper will highlight the effectiveness of audio-visual aids in science teaching in secondary schools.

#### **1. Objective of the Study**

- To study the effectiveness of using teaching aids or audio-visual aids in teaching life science at secondary level.
- To study the effectiveness of using audio-visual aids or teaching aids among the male and female students of secondary level in teaching life science.

#### **2. Hypothesis**

There is a significant difference in the life science achievement scores between students taught with teaching aids and those taught without teaching aids.

There is a significant difference in the life science achievement scores between male and female students taught with teaching aids and those taught without teaching aids.

### **3. Methodology**

#### **3.2. Sample**

All students were from the West Bengal of Secondary Education and their age groups were between 14-15 years. This experiment was done upon the student of Rathtala Colony High School; Ranaghat, Nadia. All students were from the class IX. Total number of students was 64. Among them there were 29 girls and 35 boys. Students were selected randomly from the class IX; section A, B, C and D.

#### **3.3. Tools**

##### **Tools for data collection**

Self-made question paper (for conducting achievement test). Topic of achievement test was “flower”. Topic “flower” was chosen because students have some basic idea about that topic. Types of questions were short answer type, objective type and essay type. Total number of item was 14. Total marks were 35 total number of Knowledge based questions was 12, total number of understand based questions was 10, total number of application based question was 7 and skill based question was 6.

##### **Tools for experiment**

Chart and model of different flowers, live model of China rose and Datura, Chalk, duster and black board, Dissecting tray, needle, blade, forceps etc. are used for the demonstration

#### **3.4. Method of Experiment**

The participants of this experiment were 64 (29 girls and 35 boys) secondary level student of West Bengal Board of Secondary Education. Students were divided into two groups; group-A (experimental group) and group-B (control group). Pre-test was taken upon both groups. The pretest was used to establish equality or no difference between the treatment groups at the beginning of the experiment only. After the pre-test we got the scores of both groups. Then group-A was taught with the help of teaching aids and group-B was taught without the help of teaching aids. After teaching, post-test was taken upon both groups. They were given same question paper but question arrangement was different. Then we got the result of pre and post-test of both groups. From those scores we tally and analyzed (by using ANOVA at 0.05 level of significance), whether use of T.L.M in teaching life science is significant or not at secondary level.

#### **3.5. Results and interpretations**

In this experimental study to analysis the data we used descriptive statistic, ANOVA, and Post-hoc test.

*Table 1: Descriptive statistics:*

Dependent Variable: post test

Methods of teaching	Gender	Mean	Std. Deviation	N
without teaching aids	male	11.06	5.43	15
	female	9.64	5.63	17
	Total	10.31	5.49	32
with teaching aids	male	15.35	8.60	20
	female	21.16	7.22	12
	Total	17.53	8.48	32
Total	male	13.51	7.62	35
	female	14.41	8.48	29
	Total	13.92	7.97	64

From the descriptive table (table No. 1) we can see that the students who taught with the help of teaching aids had shown the mean score 17.53 and sd. 8.48 in post-test and the students who taught without the help of teaching aids had shown the mean score 10.31 and sd. 5.49. From this table we can see another thing that the girls who taught with the help of teaching aids had shown the mean score 21.16 and sd. 7.22 in post-test and the boys shown the mean score 15.35 and sd. 8.60 where the boys who taught without the help of teaching aids had shown the mean score 11.06 and sd. 5.43 in post-test and the girls shown the mean score 9.64 and sd. 5.63.

### Pre-test Data Analysis

A variance of analysis was conducted in respect of pre-test scores to determine if there was a significant difference among the treated groups on the prior knowledge test. The result of the ANOVA analysis indicating that interaction between method of teaching and pre-test were no significant differences among the treatment groups on the test see Table No. 2.

Table 2:

*Tests of Between-Subjects Effects (prior knowledge test)*

Variable	Type III sum of square	Mean square	df	F	Sig.
Corrected model	23.766 <sup>a</sup>	23.76	1	1.08	.30
Intercept	3859.51	3859.51	1	175.72	.00
Method of teaching	23.76	23.76	1	1.08	.30
Error	1361.71	21.96	62		
Total	5245.00		64		
Corrected total	1385.48		63		

From the table No. 1 We can see that there is no significant difference between group A (experimental group) and group B (control group). That means both groups have same prior knowledge.

### Post-test Data Analysis

Table: 3

Dependent Variable: post test

Variables	Type III Sum of Squares	df	Mean Square	F	Sig.
Method of teaching	964.87	1	964.87	19.95	.00
gender	74.70	1	74.70	1.54	.21
Method of teaching * gender	202.31	1	202.31	4.18	.04

From the table No. 3 we can say that there is significant difference in the life science achievement scores between students taught with teaching aids(group-A) and those taught without teaching aids(group-B). But there is no significant difference in the achievement scores between the male and female student of group A and the male female student of group B. This table also shows that there is a significant difference in the life science achievement scores between male and female students taught with teaching aids(group-A) and those taught without teaching aids(group-B).

To further identify where the differences were, Bonferroni post-hoc test were conducted (Table: 4 and table: 5).

*Table: 4 Presents the adjusted means and standard errors for methods of teaching on post-test.*

Dependent Variable: post test

methods of teaching	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Without teaching aids	10.35	1.23	7.89	12.82
with teaching aids	18.25	1.27	15.71	20.79

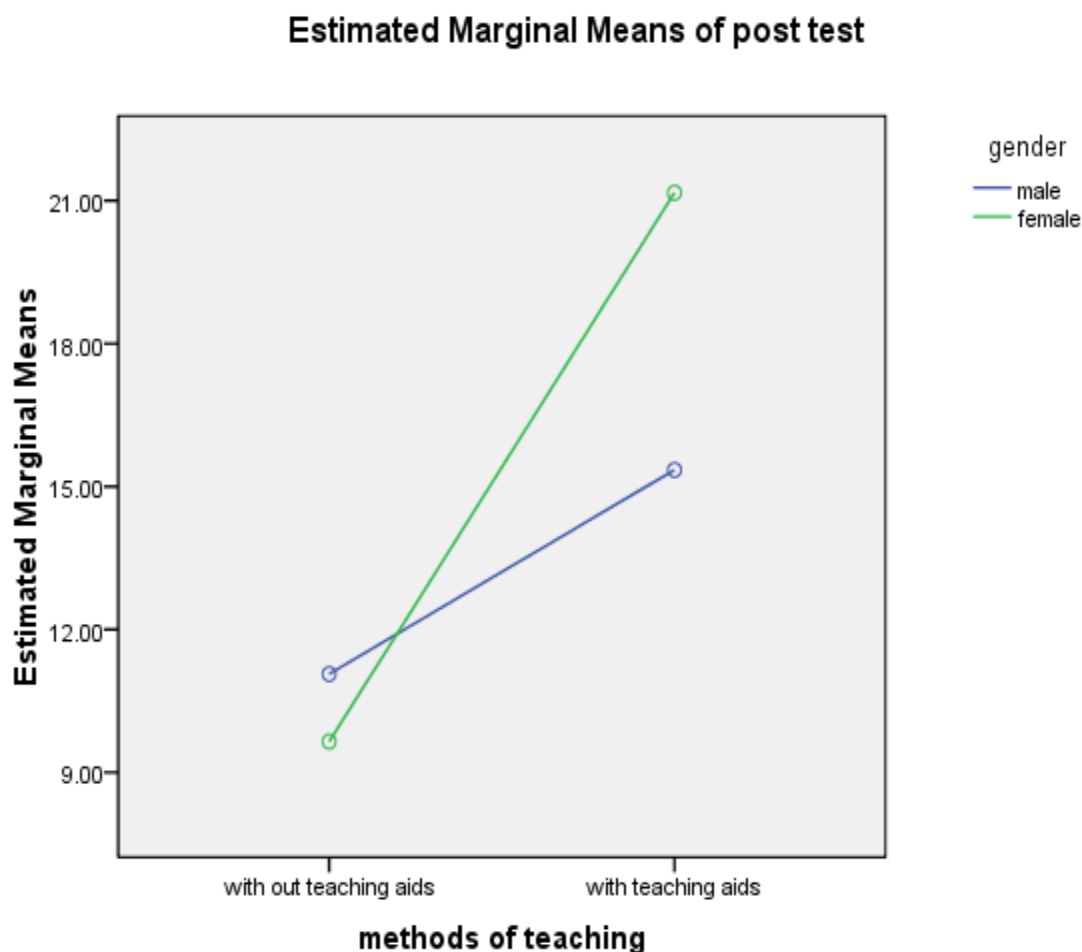
From the table no 4 we can see that the student who taught with the help of teaching aids have shown better result (total mean score is 18.25) in post-test than the student who taught without the help of teaching aids (total mean score is 10.35).

*Table: 5Presents the adjusted means and standard errors for methods of teaching and gender on post-test.*

Dependent Variable: post test

Methods of teaching	gender	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
without teaching aids	male	11.06	1.79	7.47	14.65
	female	9.64	1.68	6.27	13.02
with teaching aids	male	15.35	1.55	12.24	18.46
	female	21.16	2.00	17.15	25.18

From the table No. 5 we can see the gender differences. Here we can see that the girls who taught with the help of teaching aids have performed better (mean score is 21.16) in post-test than the boys (mean score is 15.35). On the other hand the boys who taught without the help of teaching aids have performed better (mean score is 11.06) in post-test than the girls (mean score is 9.64).



**Fig:**  
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figure

shows that the performances of male and female students in post-test. [Here blue line indicates the boy's performance in post-test and green line indicates the girl's performance in post-test].

This graphical representation is showing that the girls who taught with the help of teaching aid have shown better result in post-test than the boys. On the other hand the boys who taught without the help of teaching aids have shown better result than the girls

#### 4. Discussion

Using teaching aids or audio-visual aids in teaching life science is very effective because it helps to develop scientific attitude among the student and it also helps to understand the critical part of the life science.<sup>6</sup> An old Chinese maxim goes like one picture had more worth than thousand words. If a teacher use words along with pictures students are better able to grip the problem of the concept earlier. Students' interest increases when instructed through audio-visual media. Audio-visual aids not only make the presentation more interesting but also they engaging more than one of the senses, they also facilitate listening and memorizing.

While teaching abstract concepts or unfamiliar topic, visualization can be an essential tool of understanding.<sup>7</sup> Activity based learning leads to critical thinking, creativity, reasoning and the development of curiosity which is the real aim of education. Audio-visual aids entail activity for teacher as well as for students that keep them attentive and motivate them to think and inquire resulting in deep comprehension about what is being taught.<sup>8</sup> Student is more attentive, motivated and interested as compared to that classroom session that is in function without the use of audio-visual aids.

From the above study we can see that the students (group-A) who taught with the help of audio-visual aids or teaching aids, they visualized the problem and that made them to understand the problem and to solve the problem. So they have done better scores in post-test than the student of group-B who taught without the help of teaching aids. From this study we can see another thing, that the girls of group-A (who taught with the help of teaching aids) have done better result in post-test than the boys of group-A. So from the above study we can say that, teaching aid effects more upon the girls than the boys to achieve their desired goal.

For this experimental study we used very simple type of teaching aids or low cost teaching aids or improvised teaching aids. This proved that low cost teaching aids or improvised teaching aids are also very useful in teaching life science. All over the world teachers are innovating new teaching aids to make teaching-learning processes more interesting and effective.<sup>9</sup>

While in the development industrial nations of the first world pedagogy innovations are entered around capital intensive newly emergent information communication technologies (ICT), is capital deficient developing countries growing attention is being accorded to developing low-cost teaching aids. As implied in their nomenclature low-cost teaching aids involve minimum or nil input costs as they are made from discarded items or from materials readily available in our immediate surroundings and natural environments. Developed and produced on campus, they help institutions become self-reliant costs of education. Use of low-cost teaching aids makes the process of teaching and learning more interesting and effective.

## 5. Conclusion

The study reveals that, Teaching Aids are one of the basic components in the teaching-learning process. An efficient life science teacher is always one who makes maximum utilization of these teaching aids while executing his work inside and outside the classroom.<sup>10</sup> But it is found out that most of the time teachers use only the text book and no additional or supplementary teaching aids are made use of. It is glaring fact that even trained teachers seem to give least attention to this need. This has therefore resulted in the low achievement of the student, especially those coming from rural and interior areas of the state. There might be a number of reasons that have led to the non-utilization of aids while teaching. It could be due to non-availability of the materials or lack of creativeness on the part of the teacher. It could also be due to lack of infrastructure or management problems recto find out these causes.

Learning and teaching is the concern of the trained teachers. But learning is a complex process. It can be reinforced with learning aids of different variety because they stimulate, motivate as well as arrest learner's attention for a while during the instructional process. The need of using teaching aids in primary and secondary schools has been a matter of concern to our Government for long time. Government has tried to make it mandatory by issuing several guidelines and others time to time. Government has made it mandatory to get training before



joining in schools as a professional teacher in many states in India, resulting in a good process of imparting knowledge is practiced in the schools. It has reduced the talk and chalk method drastically. But, it is not completely flawless. It can be seen that some of the teachers, be it trained or untrained, are very reluctant to use of teaching aids in classroom. Many schools do not have sufficient number of teaching aids in their stock, although a hefty fund is issued to the schools every year by the Government. This is a prevailing problem in the implementation of various schemes by the Government.

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