

**EFFECTIVENESS OF TEACHING-LEARNING MATERIALS DETERMINING  
ACADEMIC ACHIEVEMENT OF SENIOR SECONDARY SCIENCE STUDENTS**

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**ABSTRACT:**

The present research work explores the effectiveness of Teaching-Learning Materials Determining Academic Achievement of Senior Secondary Science Students. This research was conducted on 64 students studying in class 12th in M.P.C. Senior Secondary School, Baripada, Odisha. In the study, Science Achievement Test, adopted and adapted tool was used. The teaching through Teaching-Learning Materials was given to the students after pre-test. The findings of the study revealed that Teaching-Learning Materials has significant effect on the achievement of secondary science students. Recommendations were made on the basis of obtained findings of the study.

**KEYWORDS:**

**Discipline of the study:** Education

**Concepts investigated:** Academic Achievement of Senior Secondary Science Students

**Methods and Process:**

- Experimental Research Design
- The Purposive Sampling Technique and 64 sample.
- Science Achievement Test, standardised adopted and adapted tool
- Statistical Techniques like Mean, SD, SEd and t-test.

**Geography:**

Country: INDIA, Continent: ASIA

**INTRODUCTION:**

(Bonska, 2010), Instructional materials helps in creating social awareness related to the learning process.

Teaching-Learning Materials(TLM) refers to any collection of audio, visual and audio-visual materials including animate and inanimate objects and human and non-human resources that a teacher may use in teaching and learning situations to help in achieving desired learning objectives through experiential, practical, conceptual and contextual experience, thinking as well as learning.

Teaching-Learning Materials facilitate demonstration and explanation of the selected topic content in the classroom which helps learners to experience or self-realize or rather connect to the parts of the world they could not experience while staying in the classroom situation, a teacher with special expertise are the facilitator of this process.

Students retained information for a longer time if they taught through of Teaching-Learning Materials. Teaching aids helps to develop a particular concept properly. Teaching aids provide complete examples for conceptual thinking. The teaching aids create interest, increase the vocabulary and make learning permanent. So, teaching aids provide direct experience to the students.

They can also be defined as materials or tools locally made or imported, that would help in tremendous improvement of a lesson if intelligently used. The process of teaching-learning depends upon the different types of equipment available in the classroom. There are many aids available these days like, audio, visual and audio-visual aids. They have very much importance in TLP (Teaching-Learning Process).

This study attempts to find out the effect of instructional materials on the academic achievement of students.

**LITERATURE REVIEW STUDY:**

Mayer (2010), R.E. (2009). Multimedia Learning, claims that visual materials play an important role in assisting instruction in order to clarify, define and explain the related teaching point.

Oladejo, M.A., Olosunde, G.R., Ojebisi, A.O. and Isola, O.M. (2011). "Instructional Materials and Students' Academic Achievement in Physics: Some Policy Implications. European Journal of

Humanities and Social Sciences”, claims that the utilization of improvised instructional materials promotes and enhances the effective teaching-learning process.

Sharma (2012), A. (2012). “Using instructional materials to enhance academic achievement among school students”, revealed that the effective use of instructional materials in the classroom draws the attention of students due to its multisensory experiences.

#### OBJECTIVES:

- 1) To understand the effectiveness of TLM in the course of Senior Secondary Science Students.
- 2) To understand the Effectiveness of Teaching-Learning Material in Academic Achievement.
- 3) To understand the effectiveness of remedial intervention program.

#### DELIMITATION:

- The present study is delimited to senior secondary school students only.
- The present study is confined to 10+2, 2<sup>nd</sup> year Science students of M.P.C. Senior Secondary School, Baripada, Mayurbhanj District, Odisha, India only.

#### METHODOLOGY:

a) **Method:** The method is a gateway of success on any investigation and research project. Methodology is the systematic, theoretical analysis of the methods applied to a field of study. In the present study, Experimental Research Design Research was been used. Taking into consideration the nature of the study, the investigator used the Pre-Test and Post-Test group Experimental Research Design to explore the facts related to the study regarding the effect of teaching-learning materials on the achievement of senior secondary science students.

b) **Population, Sample, Sampling Technique and Data Collection:** In the present study, the population constituted all the Senior Secondary 10+2, 2<sup>nd</sup> year Science students of Mayurbhanj District, Odisha, India. 64 Senior Secondary students studying in class 12th in M.P.C. Senior Secondary School, Baripada, Mayurbhanj district, Odisha was selected as the Sample of the study. In the present study, the researcher selected the Purposive Sampling Technique in order to select the sample.

For data collection, the researcher had adopted standardised adopted and adapted Science Achievement Test tool for senior secondary school students that includes different types of 40 questions like Multiple choice questions, fill up the blanks, Match the following, True or False, and One-Word answers.

The test contains 40 questions representing 40 marks. The reliability of the test was calculated by Split-half method. The co-efficient of reliability calculated by Spearman-Brown the formula comes out to be 0.76 which is insignificant at a 0.01 level of significance. Hence the tools are highly reliable. The tools are checked by the language and subject expert to find out the content validity of the tools.

According to the expert, the tools are valid and appropriate to measure the achievement level of students towards science. Every correct answer should be given a (1) mark and a zero (0) mark for every wrong answer. The minimum and maximum scores are 14 to 35.

After the outcome of Pre-Test, a 12 days Remedial Intervention Program was designed and intervened. In that, the students are taught using Teaching-Learning materials of quality standards and appropriate one. Then, after that Post-Test was conducted and the result was analysed and compared too.

Statistical Techniques like Mean, SD, SEd and t-test was adopted and comparative study was analysed to infer the outcome of the study.

#### DATA ANALYSIS:

**Table-1:** Comparison in scores after pre-test and post-test respectively of Science Achievement Test on Senior Secondary Science Students.

Test	N	Means	Sds	SEd	t-value

Pre-Test	32 (N1)	25.36 (M1)	7.19 (Sd 1)	1.67	3.83
Post-Test	32 (N2)	31.76 (M2)	6.12 (Sd 2)		

It is revealed from the above Table- 1, the mean scores of pre-test and post-test science achievement tests among students were 25.36 and 31.76 with SDs 7.19 and 6.12 respectively. The SED that came out from the above two tests was 1.67. The calculated t-value was found to be 3.83, which is significant at both 0.01 and 0.05 levels.

**RESULTS:** From this analysis and interpretation of the data, it was clearly found that students achieved more marks in post-test than the pre-test, which signifies that the use of TLM's by the senior secondary science student was found to be more beneficial for the study. Therefore, there is a significant difference between pre-test and post-test result on Science Achievement Test among senior secondary science school students. Therefore, it was clearly found that students achieve more in post-test than the pre-test, which signifies that the use of teaching-learning material is more effective in Academic achievement by the students.

**FUTURE PROSPECT:**

The future prospect in this context refers to the major suggestions and recommendations for further studies. From this, present study, the following would be the future prospects we can put forth:

- Teachers should be well trained through in-service training to maximize the benefits of using these aids.
- The curriculum should be designed such that there are options to activity based learning through instructional material
- We can also segregate boys students` and girls students` of any particular course and with proceed with the study.
- In the present study due to research demand and convenience samples are selected through Purposive Sampling technique. Similar study may also be taken up considering other types of sampling techniques like Random Sampling technique etc.
- The sample of the present study was taken from limited population but for better generalization of results a study covering large population can also be taken up.
- Similar study may also be taken up considering elementary and secondary level students.
- The present study is confined to achievement of science students only. Similar study may also be taken up considering achievement of humanities and other discipline students.
- In the present study due to research demand the researcher had adopted experimental research design. However, similar study may also be taken up using Case Study Research design too.
- In the present study due to research demand the researcher had adopted Remedial Intervention Program with TLM's suitable for teaching Science students only. However, this study could also be taken up by adopting Remedial Intervention Program with TLM's suitable for teaching humanities and other discipline students as well.

**CONCLUSION:** Teaching-Learning materials are important tools for the teaching-learning process. Thus, it helps the teacher to deliver the lesson effectively and students learn and retain the concepts (abstract and concrete) better and for a longer duration. The use of TLM materials improves critical and analytical thinking. It helps to remove abstract concepts through visual presentation.

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