



ISSN: 2249-894X
 IMPACT FACTOR : 5.7631 (UIF)
 UGC APPROVED JOURNAL NO. 48514
 VOLUME - 8 | ISSUE - 8 | MAY - 2019



EFFECT OF ACTIVE LEARNING STRATEGY ON SCHOLASTIC ACHIEVEMENT OF SCIENCE STUDENTS

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ABSTRACT:

Active learning strategy has been a preferable alternative to the conventional method of teaching in recent years. The purpose of this empirical study is to investigate the effect of active learning on scholastic achievement of secondary school science students. This research was carried out through an experimental design with experimental and control groups, which were equated by Raven's Progressive Matrices Intelligent test. Active learning instructional package on a few concepts of general science with various

collaborative and cooperative techniques was applied to experiment groups for 4 weeks, while the control groups were educated through traditional methods of teaching. The scholastic achievement test in Science on Physics, Chemistry, and Biology dimensions was developed by the researcher to gather the data. The collected data was analyzed by inferential statistical tests such as paired sample *t*-tests. The result of mean gain scores of the experimental group found significant at $t_{SC} = 22.016$, $t_P = 18.334$, $t_C = 16.835$, and $t_B = 15.064$ ($p < /0.01$) and revealed that active learning as an instructional strategy is effective than the conventional method of teaching in enhancing the performance of science students in Physics, Chemistry and Biology dimensions.

KEYWORDS: Active Learning Strategy, Conventional Method, Scholastic Achievement of Science, Secondary School Students.

INTRODUCTION :

Education has been undergoing a rapid change from teacher education system to the learner education system and this demands changes in the instructional process and materials used for making the process more effective. Much of the rhetoric about contemporary higher education suggests that

educational institutions need to embrace change due to advances in knowledge, technology, transportation, and more advances that have dramatically shifted the way we all function in the modern world. Much of the current literature on contemporary pedagogy advises that to best prepare 21st century learners for the increasingly complex and interconnected global society in which they live and work, institutions should implement, across all disciplines, pedagogical practices that involve interactive, inquiry- or problem-based, technology-enriched teaching and learning.

Students learn best when learning is active: When they are mentally involved when they engage in hands-on activities when they are involved in the process of inquiry, discovery, investigation, and interpretation. Thus, learning is enhanced when students repeat the information in their own words or when they give examples or make use of the information.

Active Learning Strategies help to initiate learners and faculty into effective ways to help learners engage in activities based on ideas about how people learn. Multiple active learning strategies may be used in each of the active learning

designs. Active Learning is an approach with various methods/strategies for implementation.

SIGNIFICANCE OF THE STUDY

This study investigates the impact of Active learning strategy on the scholastic achievement of Secondary School Science Students with special reference to Physics, Chemistry, and Biology fields. This study is significant in the sense that it provides opportunities for teachers and learners to explore and examine the nature of active learning in secondary school education. It also adds value and insight into how these strategies are perceived and practiced in the contemporary education system to facilitate secondary skill training.

OBJECTIVES OF THE STUDY

- To study the effectiveness of active learning instructional strategy on scholastic achievement of secondary school science students.
- To compare the effectiveness of active learning instructional strategy and conventional method of teaching in terms of students scholastic achievement in science.
- To compare the effectiveness of active learning instructional strategy and conventional method of teaching in terms of students scholastic achievement in major branches of science - physics, chemistry, and biology.

HYPOTHESES

1. There is no significant difference between teachings through active learning instructional strategy and conventional method in terms of students' scholastic achievement.
2. There is no significant difference between pre and post-test mean gain scores of the experimental group with respect to scholastic achievement in physics.
3. There is no significant difference between pre and post-test mean gain scores of the experimental group with respect to scholastic achievement in chemistry.
4. There is no significant difference between pre and post-test mean gain scores of the experimental group with respect to scholastic achievement in biology.

RESEARCH METHODOLOGY

The main focus of the present study is to know the effect of active learning instructional strategy on scholastic achievement of secondary school science students. In order to realize the objectives of the study, experimental research was carried out by the researcher. The major objective of experimental research is to establish a cause and effect relationship.

The present study was undertaken with the objectives of testing the effect of active learning strategy on scholastic achievement of secondary school science students. The researcher has prepared and validated the active learning instructional strategy package and scholastic achievement tool on selected concepts of general science to test the performance of students in major branches of science i.e., Physics, Chemistry, and Biology.

The present study was experimental in nature. Pre-test Post-test equivalent group design was followed in the present study. In this design, the pre-test on scholastic achievement in general science-based on active learning instructional package was administered before the application of treatment to the experimental and control groups and post-tests at the end of the treatment period. This design was found to be most appropriate after reviewing of related literature in experimental designs.

PARTICIPANTS

A suitable school where the experiment could be conducted was identified. Bapu High School, Triveni Road, Yeshwanthpur, Bengaluru, Karnataka has been identified to conduct an experiment using the Active learning strategy. The control group was chosen from the same school in different sections. The groups were allocated as experimental and control groups by administering them the intelligent test.

FINDINGS AND DISCUSSION

Table 1: Significant Difference between Teachings through Active Learning Instructional Strategy and Conventional Method based on Scholastic Achievement in Science of the Students

Scholastic Achievement in Science	Group	N	Mean	SD	t-value	Level of Significance
	Experimental	40	30.40	4.882		
	Control	40	17.50	4.397		

Table-1 indicates that the obtained t-value 22.182 is greater than the table value (2.58) with df 39 at 0.01 level of significance. Hence the hypothesis-1 is rejected. This shows that students belonging to the experimental group performed better with reference to scholastic achievement after treatment. Thus it can be concluded that the active learning instructional strategy is effective than the conventional method of teaching with respect to scholastic achievement in science among students studying in secondary schools.

Table 2: Significant Difference between Pre and Post-Test Mean Gain Scores of the Experimental Group based on Scholastic Achievement in Physics

Scholastic Achievement in Science	Experimental Group	N	Mean	SD	t-value	Level of Significance
	Post-test	40	9.55	2.012		
	Pre-test	40	5.10	1.878		

Table-2 reveals that the obtained t-value 18.334 is greater than the table value (2.58) with df 39 at 0.01 level of significance. Hence the hypothesis-2 is rejected. This shows that students belonging to the experimental group performed better with reference to scholastic achievement in physics after treatment. Thus it can be concluded that the active learning instructional strategy is effective than conventional method of teaching with respect to scholastic achievement in physics among students studying in secondary schools.

Table 3: Significant Difference between Pre and Post-Test Mean Gain Scores of the Experimental Group based on Scholastic Achievement in Chemistry

Scholastic Achievement in Science	Experimental Group	N	Mean	SD	t-value	Level of Significance
	Post-test	40	10.08	2.269		
	Pre-test	40	5.65	1.847		

Table-3 depicts that the obtained t-value 16.835 is greater than the table value (2.58) with df 39 at 0.01 level of significance. Hence the hypothesis-3 is rejected. This shows that students belonging to the experimental group performed better with reference to scholastic achievement in chemistry after treatment. Thus it can be concluded that the active learning instructional strategy is effective than the conventional method of teaching with respect to scholastic achievement in chemistry among students studying in secondary schools.

Table 4: Significant Difference between Pre and Post-Test Mean Gain Scores of the Experimental Group based on Scholastic Achievement in Biology

Scholastic Achievement in Science	Experimental Group	N	Mean	SD	t-value	Level of Significance
	Post-test	40	10.75	1.794		
	Pre-test	40	6.75	1.691		

Table-4 shows that the obtained t-value 15.064 is greater than the table value (2.58) with df 39 at 0.01 level of significance. Hence the hypothesis-4 is rejected. This shows that students belonging to the experimental group performed better with reference to scholastic achievement in biology after treatment. Thus it can be concluded that the active learning instructional strategy is effective than the conventional method of teaching with respect to scholastic achievement in biology among students studying in secondary schools.

CONCLUSION

Active learning helps the teacher in their efforts to differentiate instruction to improve the performance of classified and non-classified students. These strategies can support all learners to undertake inquiries and solve problems and apply what they have learned in new situations. Research studies report that many active learning strategies are equally effective for mastering content when compared to the lecture format, what is significant is that active learning strategies are superior to lectures for student achievement in thinking and writing. In active learning strategy, the teacher assumes the role of facilitator and guide. Students take the responsibility of their learning by role-playing, constructing, interpreting, preparing exhibits, processing, group work, games, and inquiry modes.

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