

EFFECT OF ACTIVE LEARNING STRATEGY ON SCIENCE ACHIEVEMENT OF LEARNING DISABLED HIGH SCHOOL STUDENTS

Kanakbala Nayak
Dr. Sudarshan Baral

Abstract

Active learning is a multi-directional learning experience in which learning occurs, teacher-to-student, student-to-teacher and student-to-student involving activity-based learning experiences: input, process and output. This study has the objectives of studying the effect of active learning strategy on achievements of learning disabled students in Physics, Chemistry and Science (Physics + Chemistry). Null hypotheses were framed for testing. Learning Disability Checklist for identification of learning disabled students and Science Achievement Test for measuring science achievement were used. The study was conducted with 15 randomly selected learning disabled high school students by following randomized pre-test post-test design. It was found that the active learning has positive effect on the achievement of LD students.

Keywords

Active learning, Learning disabled, Science achievement.

Introduction

Active learning is an umbrella term that refers to several models of instruction that focus the responsibility of learning on learners. Bonwell and Eison (1991) popularized this approach to instruction. This “buzz word” of the 1980s became their 1990s report to the Association for the Study of Higher Education (ASHE). However according to Mayer (2004) strategies like “active learning” developed out of the work of an earlier group of theorists- those promoting discovery learning.

Active learning, quite simply, is involving students directly and actively in the learning process itself. This means that instead of simply receiving information verbally and visually, students are receiving and participating and doing. The latter grouping is what is meant by active learning. So in simple terms then, active learning is: engaging students in doing something besides listening to a lecture and taking notes to help them learn and apply course material. Students may be involved in talking and listening to one another, or writing reading and reflecting individually.

Meyers and Jones (1993) define active learning as learning environments that allow “students to talk and listen, read, write, and reflect as they approach course content through problem-solving exercises, informal small groups, simulations, case studies, role playing, and other activities- all of which require students to apply what they are learning”.

Bonwell & Elison (1991) defines in active learning students are doing things and thinking about what they are doing. Active learning can involve reading, writing, discussing or being engaged in solving problems. In other words active learning is not a spectator sport...Wikipedia Dictionary defines active learning, as a process whereby learners are actively engaged in the learning process, rather than “Passively” absorbing lectures. Active learning involves reading, writing, discussion, and engagement in solving problems, analysis, synthesis, and evaluation. Active learning is also known as cooperative learning.

Johnson & others defines cooperative learning as “the instructional use of small groups so that students work together to maximize their own and each other’s learning.” It has been suggested that students who actively engage with the material, are more likely to recall information later (Bruner, 1961) but this claim is not well supported by the literature (Mayer, 2004, Kirschner, Sweller, and Clark, 2006). Rather than being behaviorally active during learning, Mayer (2004) suggests learners should be cognitively active.

The efficacy of active instructional techniques has been questioned recently (Mayer, 2004; Kirschner, Sweller and Clark, 2006). Certainly practicing procedural skills is a necessity for learning to be automated. But while these activities may be motivating for learners, these unguided situations can in fact leave learners less competent than when they began the activity (Kirschner, Sweller and Clark, 2006).

Rationale of the Study

Learning disabled students, like others have every right to flourish to the maximum of their abilities to achieve best in their life. But for their disability they achieve not up to their abilities and thereby fall behind their classmates and age mates in achievement. They should never be left to their own fate. We will have to take care to compensability to provide them all possible help to cope up with their disability and to help them reach nearer to achievement of other students of their age and grade. There are different ways to help them. Now the question arises what is the best strategy for them to compensate their achievement? To seek answer to this question the investigator felt it necessary to undertake the present project to see the effectiveness of active learning strategy on achievement of learning disabled students.

Topic of the Study

Topic identified for present investigation is *Effect of Active Learning Strategy on Science Achievement of Learning Disabled High School Students.*

Objectives

The objectives for the present study have been stated in the form of following research questions.

1. What is the effect of active learning strategy on the LD students' performance in Physics?
2. What is the effect of active learning strategy on the LD students' performance in Chemistry?
3. What is the effect of active learning strategy on Science (Phy+Chem) achievement of learning disabled students?

Hypotheses

With reference to the objectives stated above following null hypotheses have been framed for testing.

Ho₁: Active learning strategy has no effect on achievement of learning disabled (LD) students in Physics.

Ho₂: Active learning strategy has no effect on achievement of learning disabled (LD) students in Chemistry.

Ho₃: Active learning strategy has no effect on Science (Physics +Chemistry) achievement of learning disabled (LD) students.

Operational definition of the terms used

Active Learning: Active learning is a process of learning in which the students directly and actively participate, do the things by themselves and involve themselves instead of just merely receiving information. In this type of learning the students talk, listen, read, write and solve problems in groups in a cooperative manner.

Learning Disabled: Learning disabled is one who achieves less than his potency. A condition of achieving less than what one is capable to achieve is what is called learning disability.

Methodology

Participants

High School students having learning disability were the participants for this study. The participant group consisted of 15 randomly selected LD subjects.

Tools

The following tools were used by the researcher.

1. Learning Disability Checklist for identification of learning disabled students.
2. Science Achievement Test by R.D. Singh for measuring the Science achievement of LD students.

Design and Procedure

The present investigation utilized experimental method to study the cause-effect relationship. Effect of active learning strategy (independent variable) on Science achievement (dependent variable) of LD students was studied. The study was conducted by following randomized pretest posttest design. The group exposed to the independent variable consisted of 15 randomly selected LD students.

The group was pretested on dependent variable i.e. Science (Physics + Chemistry) achievement. In addition to that the group was also pretested on Physics and Chemistry achievement separately. Then the subjects were exposed to independent variable i.e. active learning strategy, for one month. After that they were post tested on the dependent variable i.e., Science (Physics +Chemistry) achievement along with separate Physics and Chemistry achievement.

Statistical Treatment

Data were subjected to the following statistical treatments for analysis in order to reach valid conclusions.

- Mean was calculated to find out the average achievement of the groups.
- Standard Deviation (SD) was worked out to know the spread of scores.
- The t-test was computed to see if there exists significant difference between the mean results of two testing sessions.

Result and Discussion

Hypothesis wise result analysis and discussion were presented as follows:

OBJECTIVE.1: What is the effect of active learning strategy on the LD students' performance in Physics?

H_{01} : Active learning strategy has no effect on achievement of learning disabled (LD) students in Physics.

Table 1
Mean, SD, SEM, t-value and table value in favor of LD Group in Physics

LD Group	N	Mean	SD	SEM	t-value	Table value	Decision
Pre test	15	13.50	3.53	1.65	6.93	2.05	Significant
Post test	15	24.93	5.31				

As exhibited in **Table 1** the pretest mean score of the LD group is 13.50 and the same is 24.93 in the posttest. It indicates that the posttest performance of the LD group is higher in comparison to that of the pretest performance. Standard deviation is 3.53 for the pretest whereas it is 5.31 for the posttest. Result of SD indicates higher spread of scores in favor of posttest performance than the pretest performance of the LD group. Obtained t-value is 6.93 which is greater than the table value i.e. 2.05 to be significant at 0.01 level. It is proved that the active learning strategy has significant and positive effect on achievement of learning disabled students in Physics.

OBJECTIVE.2: What is the effect of active learning strategy on the LD students' performance in Chemistry?

Ho2: Active learning strategy has no effect on achievement of learning disabled (LD) students in Chemistry.

Table 2
Mean, SD, SEM, t-value and table value in favor of LD group in Chemistry

LD Group	N	Mean	SD	SEM	t-value	Table value	Decision
Pre test	15	14.90	3.05	1.30	8.54	2.05	Significant
Post test	15	26.00	3.60				

The mean performance of LD group in pretest session is 14.90 and 26.00 in posttest session, vide **Table 2** Standard deviations for the pretest and posttest sessions are 3.05 and 3.60 respectively. The exhibited mean performances of pretest and posttest session refer to the fact that the LD group enhanced their performance in posttest session. The SD signifies that the scores of posttest session are more spreading than that of the pretest session. SEM is found to be 1.30 and

the t-value is 8.54. The obtained t-value (8.54) on comparison with the table value (2.05) is found to be greater and therefore considered to be significant at 0.01 levels. Hence it is concluded that the active learning strategy has significant effect on achievement of learning disabled students in Chemistry.

OBJECTIVE.3: What is the effect of active learning strategy on Science (Physics + Chemistry) achievement of learning disabled students?

H_{03} : Active learning strategy has no effect on Science (Physics +Chemistry) achievement of learning disabled (LD) students.

Table 3
Mean, SD, SEM, t-value and table value of LD group in Science

L.D. Group	N	Mean	SD	SEM	t-value	Table value	Decision
Pre test	15	27.7	5.71	3.26	7.15	2.05	Significant
Post test	15	51.00	6.99				

As revealed from **Table 3** the mean pretest score of the LD Exp. Group is 27.7 and posttest score is 51.00. This envisages the fact that the LD Experimental group performed better in posttest session as compared to that of the pretest session. The S.D. is 5.71 for the pretest session and 6.99 for post-test session. The result of SD is a sign of wider spread of scores in post test session as compared to the pre-test session. SEM is 3.26 and obtained t-value is 7.15. While comparing the obtained t-value (7.15) with the table value (2.05), it is revealed that the difference in the pretest and posttest performances of LD group is significant at 0.01 levels. This signifies that the independent variable i.e. active learning strategy has positive effect on the Science achievement of LD students.

Conclusion

Above result analysis and discussion highlighted only one fact that the active learning has positive effect on the achievement of LD students. This has been proved in the performances of LD group in Physics, in Chemistry and Science including Physics plus Chemistry.

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About the authors

Kananbala Nayak (first author) is an Assistant Teacher at Nandankanan High School, Nandankanan, BBSR, Odisha,754005. Email: kananbalanayak4@gmail.com

Dr Sudarshan Baral (second author) is a senior faculty (Reader in Education) at S. C. S. Autonomous College, Puri. Odisha. 752001. Email: baral.sudarsan@yahoo.com