

INFLUENCE OF COOPERATIVE LEARNING METHOD ON THE ACADEMIC ACHIEVEMENT OF BIOLOGY

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Abstract

This study is attempted to find out the influence of cooperative learning, STAD on academic achievement in Biology of Higher secondary school students. This is a experimental study based on simple random design for preparing two groups such as experimental and control group. Total 300 students of class XIth Biology studying in Chennai, Tamilnadu were selected as a sample for the present study. Out of which 150 students were considered in experimental group and were exposed to cooperative learning method while another 150 students were named control group and taught through conventional method (Lecture+ Demonstration+ Discussion). The students of both the groups were taught one period of 45 minutes per day for 35 days. After that a self made achievement test for Biology is administered on both the groups. After experimentation Academic achievement test scores were obtained. The data, thus collected, were analyzed through t-test. The results related to this study show that Cooperative learning oriented teaching is significantly effective for increasing the level of Academic achievement in Biology.

Keywords: *Cooperative Learning, Achievement, Conventional method, STAD, Biology Teaching*

Introduction

Number of studies have been conducted abroad to see the impact of cooperative learning method on science achievement but there is dearth of studies in Indian conditions. So, in the present study Researchers want to see the effects of cooperative learning method and Conventional method on Academic achievement in the subject of Biology.

The present study arises because of the drawback of Conventional method (based on competitive task structure) applied in the classrooms. The Conventional noticeable drawbacks of Conventional methods such as excessive competition, misbehaviour or disruptive behaviour, lack of freedom to explore their thoughts and ideas, biasness and prejudices against different castes and religions and requirements of the present society, to sort out the problems of large classrooms and individual differences of learners motivated researcher to compare it with such teaching methods which can make the learning devoid of above mentioned drawbacks. One of such teaching methods is Cooperative Learning method. Cooperative learning is an approach to instruction in which students work in small groups to help one another learn (Johnson and Johnson, 1984; Slavin, 1996).

Rationale of the Study

Teaching in large groups invariably results in the conventional one-way communication in which the teacher assumes a dominant role. The teacher's tendency lecture has encouraged educators to find ways and means of designing techniques in groups that would avoid domination of one person and encourage student participation. Teachers have considered the small groups as uniquely structured models to achieve educational goals. In small groups, the teacher is able to give individual attention to all the members of the group according to their needs. The students get an opportunity to get more actively involved in their own learning. Further, small groups are conducive for the development of multi-faceted skills among students as there is two-way communication between (i) students and students and (ii) teacher and students.

Cooperative learning encourages mutual interaction and by increasing the number of opportunities for understanding complex biological aspects and need to examine cooperative learning as an instructional approach in a conventional school context such as the one based on the assumption that it would promote active learning and meaningful interaction among learners. Specifically, the study addressed the following answers:

Objectives of the Study

1. Cooperative learning method more effective than Conventional learning method in promoting the achievement in ability of learners.
2. Cooperative learning method more effective than conventional learning method in promoting the achievement in Biology.
3. To investigate the effectiveness of cooperative learning approach in developing positive attitudes of students towards the teaching-learning process.

Hypotheses of the Study

On the basis of above-mentioned objective following hypotheses were formulated in null form-

1. There will be no significant difference in achievement mean score between Pretest of Control groups and Post-test of Control groups in learning Biology by using Conventional methods in the classroom transaction.
2. There will be no significant difference in achievement mean score between Pretest of Experimental groups and Post-test of Experimental groups in learning Biology by using Cooperative Learning Method in the classroom transaction.
3. There will be no significant difference in achievement mean score between Post-test of Control groups and Post-test of Experimental groups in Biology Chapters.

Research Model of the Study

The present study experimental in nature and the researcher used two groups such as experimental and control group. Students of class XI Biology Group from the Higher Secondary Schools of Chennai, Tamilnadu were selected as a sample for the present study. The Tool used for the study was an Achievement test constructed by researcher.

Structure and Implementation of the Study

Population and Sample for the Study

Impact of Cooperative Learning Method in learning Biology among the selected students of selected five types of schools at Standard XI in Chennai district was highlighted in the study.

Experimental Design

The researcher selected five types of (Five Higher Secondary) schools in Chennai district for conducting the study. Three hundred students were selected from five types of schools in equal strength of both control group and experimental group in the study. Equivalent Group experimental Method based on the quarterly examination marks of XI Biology.

Method of Experimental Study

The present study, the Equivalent Group experimental Method was adopted. It is the best method used to obtain information about the problems of conventional method and Impact of experimental method in learning Biology among the students.

Student Teams Achievement Divisions (STAD) First Two Chapters of Biology lessons taken for Study was used to teach experimental group. Researcher taught one period of 45 minutes per day to each and every group, for 35 days. After 25 days the students were given a gap of two days for preparation. On the announced day the achievement test for chemistry was administered on control group and experimental group. The scores thus collected were considered as Academic achievement test scores. These scores were thus analysed for finding out the effectiveness of two methods of teaching on dependent variables, i.e., Academic achievement. And Types of Schools.

Phase-1 Method and Implementation of Cooperative Learning Method

In this phase, the researcher implemented STAD Cooperative Learning Method. The construction of Cooperative learning method and Achievement test come under this phase, Identification of students from selected schools for establishing Control group and experimental group. Matching the control group and experimental group were also finalized at the stage.

Phase-2 Experimental Phase-1

In the second phase of the study, the researcher conducted the pre-test on the sample selected. The researcher teaches the unit 'Biology First Two Units' to all the students by Conventional Method of Teaching. The topic was covered within 20 days by taking one contact session of 45 minutes per day. After completing these units, a pre-test was administered to assess the students achievement in Biology Subject.

Phase-3 Experimental Phase-2

Students of Five Type of Schools formed the control group and experimental group. The students of Control group through conventional learning methods for duration of twenty teaching periods. The experimental group Cooperative Learning methods for duration of thirty five teaching periods implemented. Students of the experimental group had Individual accountability, Positive Interdependence, Group Processing and Face-to Face interaction. After through cooperative learning methods to the experimental groups through, a post-test was administered for both experimental and control groups. Variables Controlled during the Experimental Phases.

Statistical Methods Used in the Present Study

T-test was used to analyze the data. In view of the objectives of the study, the mean, standard deviation and were calculated from these raw scores. After this 't' value were calculated and compared with standard values given in t-table. In this manner, the hypotheses were tested at 0.05 and 0.01 level of significance.

Data Analysis and Interpretation

Hypothesis-1

Null Hypothesis (H₀)

There will be no significant difference in achievement mean score between Pre-test of Control groups and Post-test of Control groups in learning Biology by using Conventional methods at standard XI, Table 1.

Table 1 Mean Difference between Pre-Test Of Control Groups and Post-Test Of Control Groups

Test	N	Mean	SD	t- Value	Level of Significance
Pre control Groups	150	9.39	13.86	0.297	P>0.05
Post test control Groups	150	9.84	12.91		

The calculated value in the above table is 0.297 which is less than table value 1.96. Null hypothesis is accepted at 0.05 level. Hence there is no significant difference in achievement mean scores between pre-test of Control groups and Post-test of Control groups in learning Biology by using Conventional methods at standard XI. It substantiates that conventional methods were not effective for scoring more marks in Biology.

Hypothesis-2

Null Hypothesis (HO)

There will be no significant difference in achievement mean score between Pre-test of Experimental groups and Post-test of Experimental groups learning Biology by cooperative learning Method, Table 2.

Table 2 Mean difference between Pre-test of Experimental groups and Post-test of Experimental Groups

Test	N	Mean	SD	t- Value	Level of Significance
Pre Experimental Groups	150	9.39	3.45	24.640	P<0.05
Post Experimental Groups	150	26.29	7.38		

The calculated t value in the above table is 24.640, which is higher than table value 1.96. Null hypothesis is rejected at 0.05 level. Hence there is significant difference in achievement mean score between pre-test of Experimental groups and Post-test of Experimental groups in learning Biology by using Cooperative Learning Method in the classroom transaction. It substantiates that Cooperative Learning Method is more effective for scoring more marks in Biology. Cooperative Learning Method attracted the young learners in learning Biology the learners it proves that Cooperative Learning Method is more effective in learning Biology.

Hypothesis-3

Null Hypothesis (HO)

There will be no significant difference in achievement mean score between Post-test of Control groups and Post-test of Experimental groups in Biology Chapters, Table 3.

Table 3 Mean Difference between Post-Test of Control Groups and Post-Test of Experimental Groups

Test	N	Mean	SD	t- Value	Level of Significance
Post control Groups	150	9.83	12.29	13.719	P<0.05
Post Experimental Groups	150	26.35	7.39		

The calculated value in the above table is 13.719 which is higher than table value 1.96. Null hypothesis is rejected at 0.05 level. Hence there is significant difference in achievement mean score between post-test of Control groups and Post-test of Experimental groups in learning Biology by using Cooperative Learning Method in the classroom transaction. It substantiates that Cooperative Learning Method is more impact for scoring more marks in Biology. Cooperative Learning Method attracted the young

learners in learning Biology and the learners. It proves that Cooperative Learning Method is more effective in learning Biology.

Findings

1. There was significant difference in achievement mean score between Pre-test of Control groups and Post-test of Control groups in learning Biology by using Conventional methods
2. There was significant difference in achievement mean score between Pre-test of Experimental groups and Post-test of Experimental groups learning Biology by cooperative learning Methods.
3. There was significant difference in achievement mean score between Post-test of Control groups and Post-test of Experimental groups in Biology Chapters.

Interpretation

This is an experimental study with pretest post test equivalent group design. Entry behaviour test was conducted to separate control and experimental group to assess the previous knowledge. Both the groups are identical and this indicates the nature of identicalness in tune with the pre-test mean scores of both groups. All the pre-test 't' value for control and experimental reveal no significant difference among control and experimental groups. This establishes their identical nature and no significant achievement in their previous knowledge. The means of pre-test scores and post-test scores of control as well as experimental groups differ significantly (0.01 level) with the post test mean being greater than the pretest mean. The implication Cooperative learning methods of that enhance the learning and remarkable achievement in Biology that the level of has increased due to conventional method in control group and concept attainment and achievement in experimental group. The post test scores of control and experimental group differ significantly. The means score of experimental group is greater than of control group.

Delimitations of the Study

The delimitations of the present research study are following:

1. The study was delimited to the Higher Secondary Schools of Chennai, Tamilnadu
2. The subject chosen for the study is Biology.
3. Cooperative Learning Method, Students Team Achievement Division (STAD) has been chosen.

Suggestion for Further Research

1. Influence of Cooperative Learning Method for other subjects at Higher secondary level.
2. Influence of Cooperative Learning Method Environment in learning hard spots of the students in Biology at High school level.
3. Influence of Cooperative Learning Method learning Biology at rural schools of

standard XI.

4. Influence of Cooperative Learning Method learning Biology among the late Bloomers.

Conclusion

The Present study results show that cooperative learning and organised teaching is significantly impact for increasing the level of academic achievement of the students. So, the investigator summarizes results of this research study in favour of producing and maintaining cooperative learning environment in classrooms. The present findings of the study collaborate of the fact that cooperative learning organised teaching can increase academic achievement of the students by creating feeling of stimulation and enjoyment. In the present study, the cooperative learning environment in the classroom provided students with opportunities to analyse, synthesize and evaluate ideas cooperatively. The informal setting facilitated discussion and interaction. This group interaction helped students to learn from each other's scholarship, skills and experiences.

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