

## COOPERATIVE LEARNING- ESSENTIAL SKILL IN DEVELOPMENT OF BIOLOGY

**Dr. Roopam Jain**

Asstt. Prof.

Swami Vivekanand Subharti University, Meerut

[roopamajay@gmail.com](mailto:roopamajay@gmail.com)

### Abstract

Science is more than a body of knowledge to be acquired by the student and it involves procedures and skills of observation hypothesization drawing inference, prediction etc in the new approach emphasis was laid on development of different process skills in science. Many educators consider the development of science process skills in students to be a major goal of science education. Process of science is refers to, what scientist do? means the way scientist locate information, learn to observation, experiment, develop and test hypothesis and communicate ideas to others etc. It is also related to their pattern of thinking, curiosity, tolerance for the opinion of others willingness open mindedness and indication to make decision on the basis of evidence product basically refers to the knowledge contributed by the scientist. It includes facts, figures, principles laws formulate equations etc .The older viewpoints stressed on product approach of teaching science. But the movement without denying the importance of product approach of science emphasizes on supplementing it with process approach. The new enterprise is popularly known as process and product approach of science which de- emphasizes textbook learning, lays stress on meaningful learning and development of scientific and technological capabilities among the students.

**Key Word- Hypothesization, Observation, Tolerance, Curiosity.**

### INTRODUCTION

Till today most of the science teachers in India Indian classroom follow the conventional method that is teaching through product approach of science, emphasizing transfer of facts, figures, principles, laws etc in which learning process of science is neglected .Therefore in order to produce science and technology literate citizen for future who can apply their knowledge in their day to day life and dream positive change in society. It is necessary to supplement product approach with the process approach of teaching .This shift with respect to approach of teaching science has let the educationalist explore alternative strategies which could help in the development of process skills among the student. One of the teaching strategies where the students are active, given freedom to observe things share and discuss among themselves is cooperative learning. In cooperative learning set up students work together in small mix ability groups on academic task. Biology being one of the major components of school science, the major concern of present study is

to implement cooperative learning during the teaching of biology portion of science and find out its effect on the development of some of the process skill.

## Objectives of the study

1. To enhance the acquisition of total process skills in biology among students, focusing on improving their ability to observe, classify measure, interpret data, and hypothesize scientific concepts.
2. To improve the achievement of different components of process skills in biology, including observation, classification, inference, experimentation, and data analysis, among students through targeted instructional methods.

## Hypotheses of the study

Cooperative learning strategy would-

1. There is no significant difference in the acquisition of total process skills in biology between students who receive enhanced instructional strategies and those who do not.
2. There is no significant difference in the achievement of different components of process skills in biology between students who receive targeted instructional methods and those who do not.

## Methodology of the present study

Experimental method of research was used for this study. Design of the study was pre-test and post-test equivalent group

## Sample of the present study

200 students from three schools of Bhopal town were the sample of the study. Out of the 200 student 100 were treated as experimental and remaining 100 were considered as control group. Both the groups were matched on the basis of intelligence as well as achievement in biology

## Tools of the present study

The following test were used-

1. Process skills in biology - constructed and standardized by the researcher
2. Achievement test in biology constructed and standardise d by the researcher
3. Ravens progress matrices test

## Treatment

During the experiment, the experimental group was taught by learning together model of Johnson and Johnson and control group was taught by conventional method of teaching. The experiment was conducted during teaching the following three topics

1. Useful plants and animals
2. Conservation of natural resources
3. Adaptation and evolution

**Result and Discussion**

In order to find out the effect of cooperative learning on the acquisition of process skills in biology means standard deviation and t ratio work calculated for the pre-test and post-test gain scores in case of total as well as for its different component in process skills and presented in table-1 and 2.

Table-1 Indicates the effects of cooperative learning on total process skills on biology

**Table- 1**  
**Mean, SD and t- value of gain scores of experimental and control group**  
**in total process skills in biology**

Components of process skills	Experimental (N=100)		Control (N=100)		t- Value
	Mean	SD	Mean	SD	
Total process skills in Biology	12.58	6.58	5.34	6.55	<b>7.792**</b>

\*\* Significant at 0.01 level

The result in table-1 shows the significant positive effect of cooperative learning on total process skills. May be the free and flexible atmosphere sharing and discussion during the cooperative learning has helped the students to be involved in higher order of thinking. The finding matches with the findings of Johnson and Johnson.

The analysis of the result related to the effect of cooperative learning on different components of process skills in biology is shown in table- 2

**Table -2**  
**Mean, SD and t values of gain scores of experimental and control group**  
**in different components of process skills in biology**

Components of process skills	Experimental (N=100)		Control (N=100)		t-Value
	Mean	SD	Mean	SD	
Observation	2.68	2.02	1.35	2.20	4.435**
Generalization	2.63	1.98	1.22	2.01	4.984**
Interpretation	1.78	2.43	0.78	2.11	1.103**
Inference	2.63	2.29	1.05	2.41	4.736**
Prediction	3.19	2.48	0.97	2.51	6.272**

\*\* Significant at 0.01 level

Table-2 reviews the superiority of cooperative learning to conventional methods of teaching in improving achievement of different components of process skills in biology. It indicates that cooperative learning has significantly help in improvement of different component of process skills in biology such as observation, generalization, interpretation inference and prediction. The above significant and positive

result may be attributed to the discussion and activities which made the student to think and work together. The flexible environment of the cooperative learning help the students to observe explore think divergently and share ideas with their friends .All the above helped in improvement of achievement of different component of process skills in biology. The present finding goes in line with Berge which has shown the positive effect of cooperative learning on development of science process skills.

## Conclusion

The science teachers could be trained to integrate cooperative learning with various activities and challenging task which would lead to active sharing and discussion .The planning of science lessons should include more and more structured cooperative learning activities and assignments which can provide opportunity to the students to explore and investigate together interact and help one another in acquiring different processes of science such as observation, generalization, inference, prediction.

## References

1. Berge, Z. L. (1990) 'Effects of group size, gender and ability grouping on learning science processes skills used microcomputers'. Journal of research in science teaching.
2. Broohy, j. (1986) 'Teacher effect research association.' Saint Francisco.
3. Johnson, D.W. Johnson, Art (1975) 'Learning together and alone cooperation, competition and individualisation'. Englewood Cliffs N.J. prentice Hall.