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## Effectiveness of Project based Learning in Mathematics at Secondary School Education

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### ABSTRACT

Mathematics teaching is a field in which knowledge of the subject matter is the first necessity. Teaching mathematics, however involves more than knowledge and enjoying the subject. The mathematics teacher must be able to motivate his students, he must be able to guide them to discover ideas and he must be able to evaluate the achievement of his students. It is a teaching strategy which allows students to work together in small groups with individuals of various talents, abilities and background to accomplish a common goal. The title of present study is Effectiveness of Project based Learning in Mathematics at Secondary School Education. Objectives of the study are to study effectiveness of Project based learning strategy and traditional strategy on achievement in mathematics. Present study is delimited to class 9<sup>th</sup> students of Schools at the city Meerut (U.P).

**Key Words:** Project Based Learning, Academic Achievement, Secondary Level, Mathematics

### INTRODUCTION

Mathematics is fundamental to national prosperity in providing tools for understanding science, engineering, technology and economics. Among the reasons of the decline in Mathematics achievement in schools is because students consider mathematics as a difficult and boring subject. Mathematics teaching is a field in which knowledge of the subject matter is the first necessity. Teaching mathematics, however involves more than knowledge and enjoying the subject. The mathematics teacher must be able to motivate his students, he

must be able to guide them to discover ideas and he must be able to evaluate the achievement of his students. It is a teaching strategy which allows students to work together in small groups with individuals of various talents, abilities and background to accomplish a common goal. According to D.W. Johnson and R.T. Johnson (1991), in order to construct a lesson with project based learning five basic must be provided: Positive interdependence, Face to face primitive interaction, Individual accountability, Appropriate use of social skills, Processing how well the group is functioning. PBL Includes many principles some of these are-Principal of activity, Principal of purpose, Principal of experience, Principal of reality utility, Principal of freedom. The most important properties of this technique are the students work in four five member heterogeneous group. A single product is turned in and the groups receive reward together emphasis on team building activity and regular discussion within group about how well they are working together.

### **NEED OF THE STUDY**

In study of traditional and project based learning in mathematics to need new methods and develop the behavior of students and to make the students responsible. Some students in his study said that the complex concept or difficult problem become easier when they learn mathematics by using project method. Cooperative small group of mathematics instruction would have strong emphasis participation, which did not often appear in traditional mathematics classroom.

### **OPERATIONAL DEFINITIONS**

**Traditional learning-**Traditional method means active participation of teacher with a particular teaching method like lecture method. There is lack of student environment for students in method.

**Project Based Learning-**Project based learning is a strategy that develops healthy interaction skills promotes success of the individual student and forms personal and professional relationships.

**Academic Achievement**-Academic achievement means accomplished or proficiency of performance in a giving skill or body of knowledge.

### **OBJECTIVES OF THE STUDY**

Objectives are something that you are trying to achieve-

- To find academic achievement of class IX through traditional method.
- To find academic achievement of class IX students through project based learning.
- To compare the academic achievement of class IX students through project based learning and traditional method.

### **HYPOTHESIS OF THE STUDY**

There will be no significant difference between academic achievements of class IX students taught by traditional method and project based learning.

### **RESEARCH METHODOLOGY**

Experimental research method has been used for this study. Sample for the study have been taken 120 students. Experimental group 60 students and control group 60 students.

### **TOOLS TO BE USED**

Self made Achievement test in mathematics.

### **STATISTICAL TECHNIQUE**

In present study Mean, Standard Deviation, T-Test statistical techniques have used.

### **DELIMITATION OF THE STUDY**

- The present study will be delimited to 9<sup>th</sup> class students only.
- The students will be delimited to Meerut city only.

- The study will be delimited to project based learning and traditional method in mathematics.

## ANALYSIS AND INTERPRETATION OF DATA

**TABLE- 1.1**

**Mathematics Achievement of Students taught through PBL and Traditional Strategy**

Group	N	Mean	S.D	t-value	Df	Significance
Experimental	60	27.2	6.1	5.22	118	Significant at 0.1 and 0.5 level
Control	60	22.0	4.7			

Table 1.1 after doing the experiment, it is reflected by the test scores of both the experimental and control groups that there exists significant difference between the two groups.

It is also observed that the students permanently connect with each other and their teachers for learning and teaching, whereas in traditional teaching method, there is a feeling that the connection is less and the teacher is at the centre.

By studying together the students gain self- confidence. In project, they understand more by using mathematics language in the process of deciding with their friends.

As such, project learning method provides strong base for learning. In project based learning method, the student learns to drive logic mathematically sharing their opinions with the other and using mathematics for solving the problems.

## MAIN FINDINGS

- The Positive significant difference between the traditional method and learning together technique of project learning on the academic achievement of the students in mathematics.
- There is positive significant effect of learning together techniques of project learning on the academic achievement of high achievers.
- There is positive significant effect of learning together techniques project learning on the academic achievement of low achievers.

## SUGGESTIONS FOR FUTURE STUDIES

Any research work cannot say the final word of a problem because it is very difficult for a researcher to touch all the aspects of a problem following suggestions for further study in their research may not be out of place here they can be enumerated as :-

- The effect of the project based learning in different situations like- rural, urban, male, female students and mixed genders at different levels is carried out.
- The study may be conducted at different levels i.e. Secondary, higher secondary and university level of education.
- The study may be carried out by taking account the boys and girls separately.
- Mathematics laboratory should be designed for use. These laboratories should be designed to provide group learning.
- This study examined only the academic achievement of students in mathematics. Further studies may be conducted to investigate the effectiveness of project based learning for other department variables, such as attitude towards subjects, self-esteem, social skills and academic motivation for different subject.
- A project based learning strategy can be conducted in students English medium schools and Hindi medium schools.

## REFERENCES

- **Akinsola, M.K.(2007).** The effect of simulation games environment on students. The Turkish online Journal of Educational Technology, Vol. 6, No. 03.
- **Ali, Riasat & Akhtar, Aqua (2011).** The impact of motivation on students academic achievement in mathematics in problem based learning environment. International Journal of Academic Research, Vol. 3 No. 1
- **Anice, James (2006)** Technique of Mathematics (Ist edition), New Delhi: Neel Kamal Publication.
- **Kaul, Lokesh (2008).** Methodology of Education Research (3<sup>rd</sup> edition), New Delhi: Vikas Publication.
- **Kothari, C.R. (2010).** Research Methodology (2<sup>nd</sup> edition), New Delhi: New Age International Publishers.
- **Maqsd, Muhammad. (1998).** Effects of meta cognitive instruction on mathematics achievement and attitude towards mathematics of low mathematics achievers. Educational Research, Vol. 40, No.2.
- **Mangal, S.K. (1997),** Teaching of Mathematics (3<sup>rd</sup> edition), Jalandhar: Parkash Brother Publication.
- **Memaster Kristen, Nyman & Fuchhs, Douglas. (2002).** Effect of cooperative learning on the academic achievement in Science. Journal of Science and Mathematics Education in S.E., Asia, Vol. 26 No. 2.
- **Quinn Zhining (1995).** Cooperative versus competitive efforts and problem solving. Review of Educational Research, Vol 65 Ne.2.
- **Ramsay, G.Shula and Richards, C. Herbert (1997).** Cooperative learning environments: Effects on academic attitudes of gifted students. Gifted Child Quarterly, Vol.41, No. 4.
- **Sharan, V. (2010).** Cooperative Learning for Academic and Social Grains: valued pedagogy problematic practice. European Journal of Education, Vol. 45, No.2.
- **Slavin, Robert E. (1983).** When does Cooperative Learning Increase Student Achievement? American Psychological Association, Vol. 94.

- **Surapuramath, Kotreshwaraswamy (2010).** Relationship between school climates with academic achievement of students in mathematics. International Research Journal, Vol. 1, No.11.
- **Zakaria, Effandi, Chin, Lu Chung (2010).** The Effect of / Cooperative Learning on Students mathematics achievement and attitude towards mathematics, Journal of Social Science, Vol. 6, No.2

