

The Effect between Lecture Method and Lecture cum Demonstration Method in Teaching Mathematics in Class IX Standard of West Bengal Board of Secondary Education

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Abstract

The purpose of this study was to examine The Effect between Lecture Method and Lecture cum Demonstration Method in Teaching Mathematics in Class IX Standard of W.B.B.S.E. For this purpose the investigator constructed a Questionnaire on "Achievement Test in Mathematics" containing four dimensions for class IX to collect the data. The researcher selected one secondary schools in Murshidabad district from rural areas. The questioners were supplied to 20 students (10 boys & 10 girls). The Lecture cum Demonstration method would be more effective in teaching Mathematics than that of Lecture Method.

Keywords: Achievement Test, Demonstration method, Lecture Method, Rural Areas.

Introduction

A teaching method comprises the principles and methods used by teachers to enable student learning. These strategies are determined partly on subject matter to be taught and partly by the nature of the learner. For a particular teaching method to be appropriate and it has to be in relation with the character of the learner. Suggestions are there to design and selection of teaching methods must take into account not only the nature of the subject matter but also how students learn. In today's school the trend is that it encourages a lot of creativity. It is a known fact that human advancement comes through reasoning. This reasoning and original thought enhances creativity.

Demonstration Method is the process of teaching through examples or experiments. For example, a science teacher may teach an idea by performing an experiment for students. A demonstration may be used to prove a fact through a combination of visual evidence and associated reasoning.

Demonstrations help to raise student interest and reinforce memory retention because they provide connections between facts and real-world applications of those facts. Lectures, on the other hand, are often geared more towards factual presentation than connective learning.

Teaching schedule

The two groups were taught about same topics alternatively in 4th periods of 40 minutes lesson by using lesson plan prepared by the researcher, and this lasted for three weeks.

Out of 40 minutes, 20 minutes for The Experimental Group and 20 minutes for other group.

The experimental group was taught with Lecture cum Demonstration method instructional package, while the control group was taught using conventional method (Lecture Method) of teaching.

One week was used for revision, and the items used for the pre-test were rearranged and used for the posttest.

Relevant audio visual aids (Lecture cum Demonstration method) were also available as a source of information for The Experimental Group.

Objective

- To examine the scores of Mathematics obtained by the secondary school students in class IX are normally distributed.
- To examine the significant difference of the scores of Mathematics obtained by the total boys and girls

respectively between Lecture cum Demonstration Method and Lecture Method.

Hypotheses

H₀₁:The scores of Mathematics obtained by total students are not normally distributed due to gender variation.

H₀₂: There exist no significant difference of the scores of Mathematics obtained by the total boys between Lecture cum Demonstration Method and Lecture Method.

H₀₃: There exists no significant difference of the scores of Mathematics obtained by the total girls between Lecture cum Demonstration Method and Lecture Method.

Methodology

An experimental design has been used for the study.

Sample

The present study is conducted upon the class IX secondary school students of West Bengal from the district Murshidabad. Simple Random Method has been used for the study. The researcher selected one secondary school [Domkol Model School] in Murshidabad district. The questionnaire was supplied to 20 secondary school students of class IX.

Tool

The investigator constructed a Questionnaire on "Achievement Test in Mathematics" containing four dimensions.

Objectivity, Validity and Reliability of the Test: Objectivity is considered as one of the three important technical characteristics for being a good test. Previously, objective tests were regarded as tests which were not based, not influenced by examiners opinion, attitude or judgment that is impersonal. Now-a-days impersonality is considered as one aspect of objective tests. Besides impersonality, there must be some specific objectives of the test. A test should have in scoring.

Objectivity in Construction:

While construction, a test must have some objectives on the basis of which items were selected. When the test items were selected in such a way that they gave a reflection against their respective objectives, the test was said to have objective based. Hence the objectivity of the tool was maintained.

Objectivity in Administration:

The responses of subjects were sometimes disturbed by their physical and psychological

conditions. Sometimes it may also be affected by the environmental conditions. When environmental and other conditions during the administration of the test in different occasions were controlled to the best test is set to be objective in administration. In the present study, the test was administrated on two occasions. The atmosphere, the Teachers and hours of the day (during second to fourth period and fifth to seventh period) selected for administration of the test were same in both the occasions. Both environmental and psychological conditions were controlled as far as possible. To maintained objectivity in administration, same types of direction were given to each student on both the occasions of the test and retest. In this way, objectivity in administration was maintained.

Objectivity in scoring:

"A test is said to be perfectly objective in scoring if the rescoring of a set of test paper produced scores identical to the initial scores assigned to those same paper."- Thomas R Knopp.

In maintaining objectivity in scoring in the present study, a scoring principle was framed, and items were evaluated by one person (Investigator). On the basis of this principle, each item was worded in such a way that there was only one answer. Thus the evaluation of the test was impersonal. So the objectivity of the test in scoring was maintained.

Blue Print of the Achievement Test in Mathematics

SL No.	Dimensions	Question No.
1.	Knowledge	1-10
2.	Understanding	11-22
3.	Application	23-27
4.	Skill	28-30

Validity of the Test:

The term 'validity' is related and based upon common factor variance. The validity of a test means the efficiency with which it measure its purpose to measure when compared with accepted criteria. "For practical purpose, validity of test can be subsumed under two can be subsumed under two categories content validity and statistical validity. A test is said to have content validity if it appears to be an appropriate measure of some particular traits both because of the way in which the test is developed and because of the makeup of the items themselves. A test is said to have

statistical if scores on some generally acceptable external criterion reassures of the same or an over more relevant traits."

Internal Validity:

Internal validity of the present test was assured in the following manner. The content areas of test items were selected against each dimension of knowledge, understanding, application and skill. Items were judged by an expert and then tried out upon a small sample of subject. Ambiguities and misunderstanding that appeared in connection with certain items were modified in statements.

Predictive internal and external validity of the test was determine by finding out the coefficient of correlation between the test score and the score in Mathematics in the last annual examination, total score in last annual examination, test score of knowledge in test, test score of understanding in test, test score of problem solving in test, test score of application in test and test score of skill in test.

The Content validity was established after consulting with 3 experts. The questions which were ambiguous were removed. Out of 55 questions 30 were finally used in the questionnaire.

Reliability of the Test:

The term 'reliability' refers to the consistency of score obtained by the same individual when re-examined with the same test on different occasions or with different sets of equivalent items. The measurement of test consistency was assured in terms of coefficient of correlation. Out of four methods of computing reliability of a test (Test-Retest method, method of using parallel forms, split-half method, Kuder-Richardson technique) Test-Retest method was selected.

The Test-Retest Method:

In this method the same test is repeated twice to randomly selected students from the total sample. The temporal as well as randomly fluctuations both in test and the environment is controlled. The coefficient of correlation on the two tests score gives the coefficient of stability or temporal stability. In the present study, test-retest method was applied to determine the reliability of the test. The test was re-administered upon 20 original sample. To reduce the memory effect minimum retest was held after fifteen days of the first

administration and retest were the same on both the occasions. Since the test in study was not homogenous and the items did not have difficulty values split-half method for finding the reliability co-efficient was not adopted.

In the present study, it was very difficult to purpose two parallel forms of the test with same mean, same selection and same difficulty of items. So to determine the reliability coefficient of the test, the parallel form method was not up. The Kuder-Richardson Technique is based upon same assumptions which are:

- i) All the items should have same difficulty.
 - ii) The item inter correlation should be equal.
 - iii) The test should measure essentially the same ability.
- The reliability computed by this method is always lower than obtained from other method.

The assumptions were not adequate in the present study. So, this technique was not adopted. The score of the test-retest of 20 students were shown in a scatter diagram .The correlation coefficient (r) between test and retest was found to be 0.98 which was highly significant at the point 0.01 level of confidence. Thus the reliability of the test was assured.

Data Analysis

Table-1: Tests of Normality for total boys

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statis tic	df	Sig.	Statis tic	df	Sig.
Lecture cum Demonstration Method	.153	10	.200*	.968	10	.870
Lecture Method	.156	10	.200*	.954	10	.717

a. Lilliefors Significance Correction

*. This is a lower bound of the true significance.

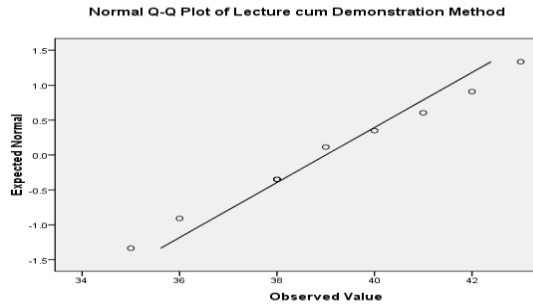


Figure:1 - Normal Q-Q Plot of Lecture cum Demonstration Method for total boys.

Table-2: Tests of Normality for total girls.

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Lecture cum Demonstration Method	.224	10	.168	.909	10	.272
Lecture Method	.223	10	.172	.911	10	.288

a. Lilliefors Significance Correction

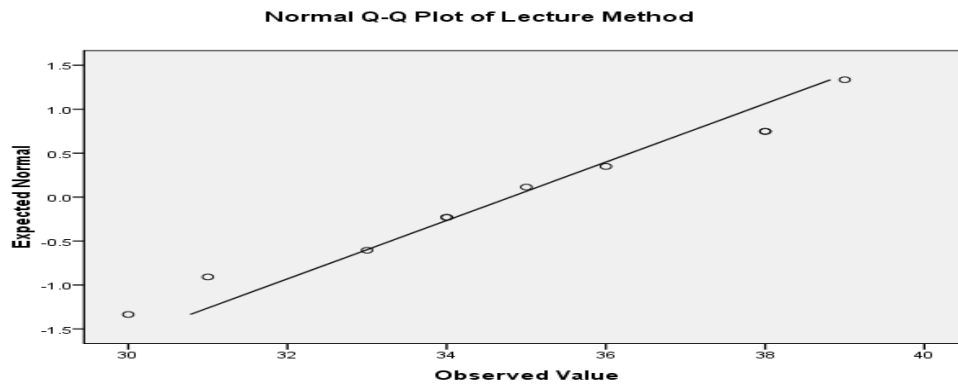


Figure:2 - Normal Q-Q Plot of Lecture Method for total boys.

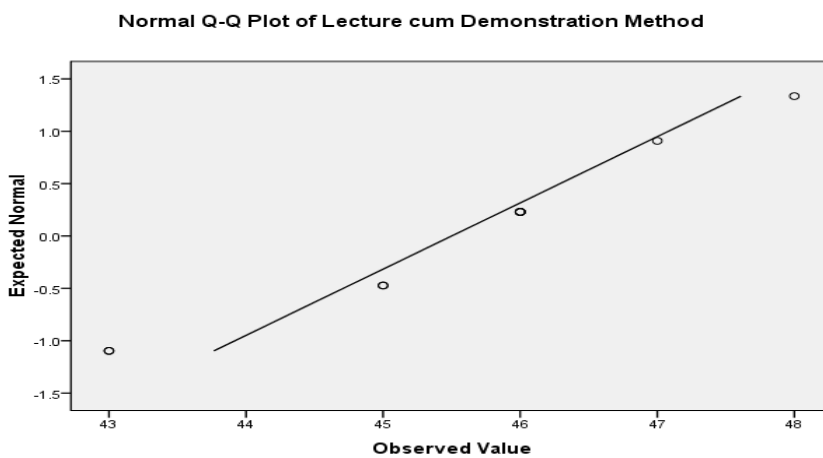


Figure-3: Normal Q-Q Plot of Lecture cum Demonstration Method for girls.

Table 4: Paired Samples Test for total girls students

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Lecture cum Demonstration Method - Lecture Method	9.4000	3.20416	1.01325	7.10788	11.69212	9.277	9	.000

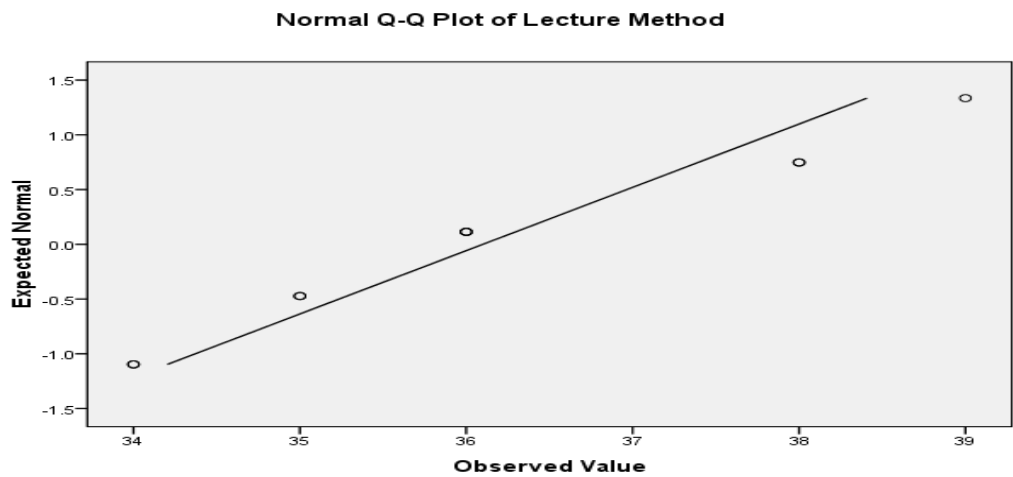


Figure -4: Normal Q-Q Plot of Lecture Method for total girls.

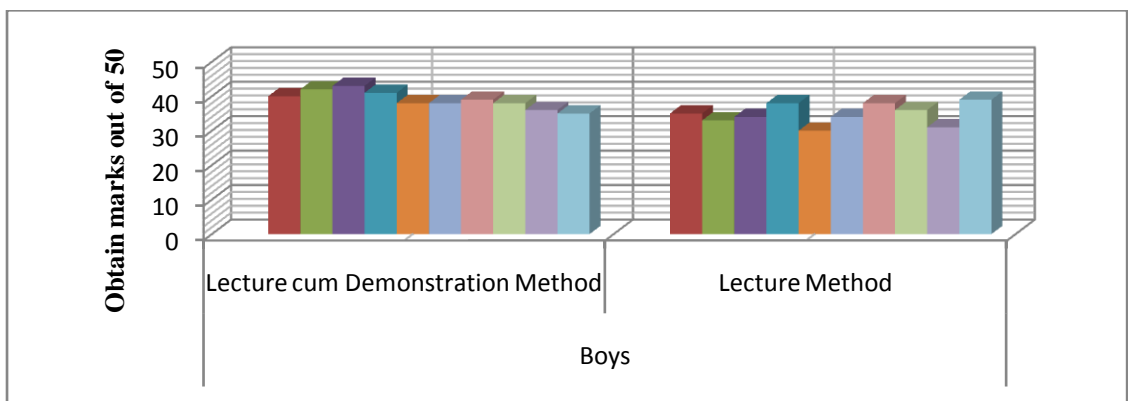


Figure:5 - Column Graph showing marks of total Boys of L.Sc between Lecture Method and Lecture cum Demonstration Method.

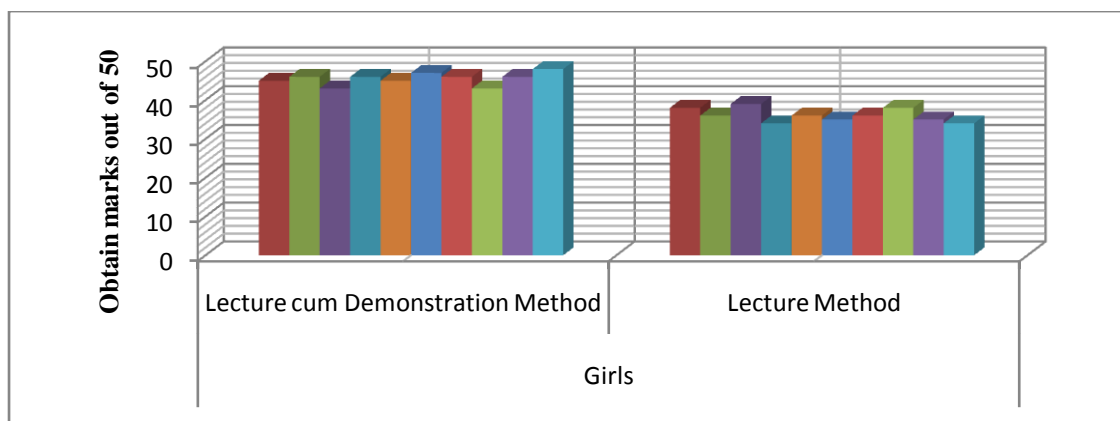


Figure:6 - Column Graph showing marks of total Girls of L.Sc between Lecture Method and Lecture cum Demonstration Method.

Discussion

From Table-1 and Table -2 A Shapiro-Wilk's test p value =.870, .717 and .272, .288 (Lecture cum Demonstration and Lecture Method)> 0.05 and a visual inspection of their normal Q-Q plot show that the scores of Lecture cum Demonstration and Lecture Method were approximately normally distributed for both boys and girls. From Table -3 p value=0.009 for total boys and from Table-4 p value=0.000 for total girls which are < 0.05 levels, significant at 0.05 levels.

Findings

The scores of Mathematics obtained by total students are approximately normally distributed due to gender variation.

There exists a significant difference of the scores of Mathematics obtained by the total boys between Lecture cum Demonstration Method and Lecture Method.

There exists significant difference of the scores of Mathematics obtained by the total girls between Lecture cum Demonstration Method and Lecture Method.

Conclusion

The Lecture cum demonstration method is more effective in enhancing students' achievement in Mathematics than the Lecture Method as revealed from the result of this study. Students have gained a better understanding of the concepts more effectively when they are engaged to solve problems during classroom activities.

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