

# EFFECT OF VEDIC MATHEMATICS ON ACHIEVEMENT IN RELATION TO INTELLIGENCE

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## Abstract

*The present study was undertaken to study the effect of Vedic Mathematics on achievement in relation to intelligence among adolescents. A sample of 120 students was drawn randomly from class IX studying in two CBSE affiliated schools located in Amritsar. In the present study pre-post experimental design was employed. Experimental group was taught through Vedic mathematics and other group was taught through conventional method. The findings of the study were: 1) Achievement of the students taught through Vedic mathematics was found to be higher than those taught through conventional mathematics. 2) Achievement of the students taught through Vedic mathematics with high intelligence is higher than those with average and low intelligence. 3) Achievement of the students taught through Vedic mathematics with average intelligence is higher than those with low intelligence.*

## Introduction

Vedic mathematics is the ancient system of mathematics which was rediscovered from Vedas between 1911-1918 by Sri Bharati Krishna Tirthaji. The word “Vedic” is derived from the word “Veda” which means the store-house of all knowledge. Vedic mathematics is mainly based on 16 Sutras (or aphorisms) dealing with various branches of mathematics like arithmetic, algebra, geometry etc (Sriskandarajah). Sutra’s of Vedic mathematics provides simple pattern for mental calculation and are helpful for assessing sum, division, or other computations. Vedic mathematics also provides a system of checking the calculations and getting the correct results.

Vedic mathematics deals with several basic as well as complex mathematical operations. Especially, methods of basic arithmetic are extremely simple and powerful (Nicholas, Williams, & Pickles, 1984). The Vedic system allows children to use these principles to simplify a math problem to a level that they can master and build their ‘Number Sense’. For your child, it means having an advantage in mathematics and logic that will help them to excel in the classroom and beyond (William). It can induce creativity in intelligent pupils, while helping slow-learners grasp the basic concepts of mathematics. A wider use of Vedic math can undoubtedly generate interest in a subject that is generally dreaded by children (Das).

## Review of Related Literature

Thapliyal (2008) conducted a study on Vedic mathematics for faster calculation and high speed VLSI Arithmetic and reported that Vedic mathematics algorithms leads to faster mental calculations, high speed VLSI Arithmetic

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architectures can be derived from Vedic mathematics and due to its parallel and regular structure the Vedic algorithms can be easily laid out on silicon chip. Bengali (2011) studied Vedic Mathematics and its application in computer arithmetic and reported that Multiplication, Squaring, Division, Sine and Cosine Vedic algorithms were designed in Virology and compared to Design Ware block with criteria as cycle time, area and power. It is observed that Vedic multiplication performs better than Design Ware for cycle time, but has significantly larger area. Indukuri (2012) conducted a research on improving computational skill using Vedic Mathematics to check the difference between the accuracy and time taken by students in pretest accuracy of the students in doing calculations. It was concluded that there is a considerable positive change in the result of accuracy of the students.

### **Significance of the problem**

Nowadays students are facing a tough competition in both curricular and non-curricular activities. They are pressurized by their parents to achieve very good marks, especially in mathematics because mathematics is the base for other subjects. Because of these high expectations from their parents, sometimes students do not able to perform as per their capabilities. Learning mathematics is an unpleasant experience to some students mainly because it involves mental exercise and is a difficult. In fact, it is not difficult, but the system which is being used to teach mathematics is making the subject abstract and difficult. In order to enable a child learn mathematics in an easy way, it is necessary to get him acquainted with alternative system like 'Vedic Mathematics'. According to information theory, greater information about a system reduces its entropy and increases the knowledge of that system (Singh, 1966). Such a system not only creates interest in the subject but also provides for easy and quick calculations. It can induce creativity in students, while helping slow-learners grasp the basic concepts of mathematics and generate interest. Therefore, the present study have been undertaken to see the effectiveness of Vedic Mathematics over traditional method of teaching of mathematics.

### **Procedure of the study**

#### **Sample**

For this investigation, a sample of 120 students was drawn randomly from class IX studying in two CBSE affiliated schools located in Amritsar. The students were divided into two groups. Each group was given separate treatment i.e. one group was given treatment of Vedic mathematics and other group was given treatment of conventional mathematics.

#### **Research Design**

In the present study pre-post experimental design was employed. Experimental group was taught through Vedic mathematics and other group was taught through conventional method. Vedic mathematics approach was taken as independent variable and achievement in mathematics was taken as dependent variable.

#### **Tools used**

1. For selected topics of mathematics Achievement test was developed to measure the performance of the students before and after the treatment.
2. Vedic Mathematics program was developed by the investigator.
3. Group General Test of Intelligence (Ahuja, 1990) was administered to equate the students on the basis of intelligence test scores.

### Statistical Techniques Employed

Descriptive statistics such as measures of central tendency and dispersion were used to study the nature of distribution of data. t-ratio was computed to find the significance of difference between means of pre-test and post-test scores.

### Objectives

1. To develop achievement test for selected topics of mathematics of grade IX.
2. To study difference in learning outcomes of grade IX students taught through Vedic mathematics and conventional method.
3. To study the effect of Vedic Mathematics on achievement in algebra of adolescents with different levels of intelligence.

### Hypotheses

1. There exists no significant difference between mean scores of students taught through Vedic mathematics and conventional method.
2. There exists no significant difference in achievement in algebra of students with respect to different levels of intelligence.

### Results and Discussion

**Hypothesis 1** “There exists no significant difference between mean scores of students taught through Vedic mathematics and conventional mathematics”

In order to test this hypothesis, Mean and S.D. and t-ratio of achievement scores in Mathematics of students were calculated as shown in the Table 1 below:

**Table 1: Mean, Standard Deviation and t-ratio of achievement scores in Mathematics of students**

Group	N	Mean	S.D.	SE <sub>D</sub>	t-value
Control group	60	7.7917	4.89491	0.89	4.56**
Experimental group	60	11.8833	4.93377		

\*\* Significant at 0.01 level (Critical Value 1.98 at 0.05 and 2.62 at 0.01 level, df 118)

From the above table, t-ratio testing the significance of mean difference between the achievements of experimental group (taught through vedic mathematics) and controlled group came out to be 4.56 which is significant at 0.01 level. Hence the hypothesis, “There exists no significant difference between mean scores of students taught through Vedic mathematics and conventional mathematics” is rejected.

**Hypothesis 2** “There exists no significant difference in achievement in algebra of students with respect to different levels of intelligence”

In order to test this hypothesis, Mean and S.D. and t-ratio of achievement scores in Mathematics of students with respect to different levels of intelligence were calculated as shown in the Table 2 below:

**Table 2: t-ratio for different combinations of different intelligent groups**

Variables	High Intelligence			Average Intelligence			Low Intelligence		
	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.
		32	14.18	3.93	56	9.08	4.96	32	6.81
<b>High Intelligence</b>									
N	Mean	S.D.	---		4.98**			7.12**	
32	14.18	3.93							
<b>Average Intelligence</b>									
N	Mean	S.D.	---	---				2.15*	
56	9.08	4.96							
<b>Low Intelligence</b>									
N	Mean	S.D.	---	---			---		
32	6.81	4.33							

\*\*Significant at 0.01 level and \* significant at 0.05 level

(Critical value 1.99 at 0.05 level and 2.63 at 0.01 level, df 86)

(Critical value 2.00 at 0.05 level and 2.66 at 0.01 level, df 62)

From the above table, (a) t-ratio testing the significance of mean difference on achievement scores of high and average intelligence group is 4.98, which in comparison to the table value was found to be significant at 0.01 level of confidence. Hence it may be inferred that mean gain in achievement scores was significant for high and average intelligence group. (b) t-ratio testing the significance of mean difference on achievement scores of high and low intelligence group is 7.12, which in comparison to the table value was found to be significant at 0.01 level of confidence. Hence it may be inferred that mean gain in achievement scores was significant for high and low intelligence group. (c) t-ratio testing the significance of mean difference on achievement scores of average and low intelligence group is 2.15, which in comparison to the table value was found to be significant at 0.05 level but not significant at 0.01 level of confidence. It may be inferred that mean gain in achievement scores was significant for average and low intelligence group only at 0.05 level of confidence. Hence the hypothesis “There exists no significant difference in achievement in algebra of students with respect to different levels of intelligence”, is rejected.

## Main Findings

- Achievement of the students taught through Vedic mathematics was found to be higher than those taught through conventional mathematics.
- Achievement of the students taught through Vedic mathematics with high intelligence is higher than those with average and low intelligence.
- Achievement of the students taught through Vedic mathematics with average intelligence is higher than those with low intelligence.

## Educational Implications

Vedic Mathematics is indeed a wonderful and truly less time consuming technique and should be introduced in school curriculum as is it an easy way to solve mathematical problems with the help of just sixteen sutras and can also help in developing interest in the subject. The school authorities should encourage teachers in using Vedic mathematics as it increases the concentration of students. Teachers should be given training in making the use of Vedic mathematics in their classrooms. In this regard, seminars and workshops may be conducted to provide practical training in using this method.

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