Scholarly Research Journal for Interdisciplinary Studies,
Online ISSN 2278-8808, SJIF 2016 = 6.17, www.srjis.com
UGC Approved Sr. No.45269, SEPT-OCT 2017, VOL- 4/36
10.21922/srjis.v4i36.10016

EFFECTIVENESS OF VEDIC MATHEMATICS IN THE CLASSROOMS

Archana V Katgeri
Assistant Professor, Hansraj Jivandas College of Education, Khar, Mumbai
archanakatgeri@rediffmail.com

Introduction

Vedic Mathematics was discovered by Indian mathematician Jagadguru Shri Bharathi Krishna Tirtha in the period between A.D. 1911 and 1918. Later the findings were published in form of a book on Vedic Mathematics by Tirthaji Maharajwho was also known as Bharati Krsna. Bharati Krsna was born in 1884 and died in 1960. He was a brilliant student, obtaining the highest honours in all the subjects he studied, including Sanskrit, Philosophy, English, Mathematics, History and Science. When he heard what the European scholars were saying about the parts of the Vedas which were supposed to contain mathematics he resolved to study the documents and find their meaning. Between 1911 and 1918 he was able to reconstruct the ancient system of mathematics which we now call Vedic Mathematics.

Vedic Mathematics is a collection of Techniques/Sutras to solve mathematical arithmetic in easy and faster way. It consists of 16 Sutras (Formulae) and 13 sub-sutras (Sub Formulae) which can be used for problems involved in arithmetic, algebra, geometry, calculus, conics.

Vedic Mathematics is a system of mental Mathematics. Many of the Vedic methods are interrelated. For example, division can be seen as an easy reversal of the simple multiplication method (similarly with squaring and square roots). This is in complete contrast to the modern system. Using regular mathematical steps for solving problems at times are intricate and time consuming. But using Vedic Mathematics'General andSpecific Techniques numerical calculations can be done very fast and accurately.

The context

It is noticed that many a times in the classroom students fear Mathematics and try to avoid it due to inefficiency in carrying out long multiplication, division or conversions, solve sums based on squares and cube root. Many a times students lose out on scoring full marks in Mathematics due to silly mistakes made in long calculations. Also, students are not able to

complete their papers during examination. Keeping this background in mind the researcher felt like taking up an action research study on using the Vedic Mathematics techniques for students in the classroom.

Need of the study

Review of the related literature facilitated to be familiar with the depth of the researches conducted on Vedic Mathematics. Much work has been done in the recent years that points to the need for teachers to enhance the Computational skills of the students.Most of the research was on only one technique of multiplication of Vedic mathematics which showed positive results and proved that the mental thinking of the students increased by practicingVedic mathematics.

The present study focused on the Vedic Mathematics technique for square and square roots. The research not only focused on the achievement but also how faster students could solve the sums by this technique in comparison to the traditional techniques used.

Research Questions

1. In what ways does training in Vedic Mathematics affect the students' performance?
2. Does the Vedic Mathematics Technique help students to solve sums based on square and square roots faster?

Statement of Research

The research was carried out with the intention of making mathematics more ease and interesting for students.The statement of research was Effectiveness of Vedic Mathematics in the Classrooms.

The study was done with a motive to enhance accuracy and speed of students in solving mathematical operations in a simple way which is faster.This would increase their performance in the subject as well as these techniques will be useful in many ways when students appear for competitive exams to score better.

Variables of the study

Dependent variables

Performance and Time

Independent variables

Vedic Mathematics technique for square and square roots.

Objectives

1) To study the effectiveness of Vedic Mathematics technique for enhancing the performance of the students in solving square and square roots.
2) To study the effectiveness of Vedic Mathematics technique for enhancing the time taken by the students in solving square and square roots.

Hypothesis of the study

1) There is no significant difference in the pre-test and post-test scores of the students' performance in square and square roots after implementation of the Vedic Mathematics technique**.**
2) There is no significant difference in the pre-test and post-test time taken by the students for solving the sums of square and square roots after implementation of the Vedic Mathematics technique**.**

Sample:

There were 32 pupils who participated in the study from class sixth of a school run by a NGO,affiliated to SSC Board situated at Cotton Green, Mumbai.

Methodology

An action research study, which was classroom-based and teacher initiated, was undertaken.

Plan

The researcher used single group pre-test –post-test experimental design where, the control and the sample was the same which was under observation. The researcher planned to teach the technique to the students for two weeks and to check the effectiveness of it by conducting a pre-andpost-test.

Act

The experiment was conducted for two weeks including pre-preparation and pre-and post-test. A pre-test was conducted before and after that Vedic Mathematic technique was introduced to student followed by lot of practice and at the end post- test was conducted for the same.

The data was collected and evaluated on the same day noting the time and the score of the students.

The researcher first conducted the pre-test which had 6 questions which maximum students could complete in 10 minutes. Then later the researcher taught the new technique of solving

and gave a practice of the same.Later the researcher conducted the post-test which included 6 questions which were of same level as pre-test.

The data collected was to check the time limit students take to solve by traditional method as by Vedic mathematics method as well as to check the efficiency of both the matters for which pre andpost-test was designed which had the same difficulty level and the results were noted. The time was noted when the students completed both the test for each technique.

Observe

The researcher found the students very excited about the Vedic Mathematic classes and were eager to learn something new and so didn't miss a single class. The first two days the students took a little longer time to understand the technique but later as they understood they started enjoying and looking forward for the classes. Also, towards the end of the training they wanted to know many more techniques for other fundamental operations in Mathematics that would make the calculations more simple and faster.

Reflect

After every session, the researcher reflected on the outcome and the necessary changes to be imbibed as per the students' requirement. Like, few students required more repetition and explanation of the technique with a slower pace while some were very quick so they had to be provided with extra sheets. By the end of the training program 80 percent of the students were at par and had shown remarkable improvement in their performance.

Scope and De-Limitations of the study

The present study has been restricted only to the secondary school where the experiment was conducted.

The present study focuses only on the Vedic mathematics technique for square and square roots.

Significance of the Study

The study will be helpful to the curriculum designers to bring about the necessary changes to equip the teachers for being more competent in Vedic Mathematics. The study will also be helpful to know the effectiveness of the Vedic mathematics techniques practically in the classroom and also students' response to it.This knowledge, combined with the use of regular conventional methods in Mathematics would help to build a positive attitude and drive away the fear towards the subjectof Mathematics among the students.

Tools for the study

The Vedic Mathematics technique for square and square roots was used as given by Jagadguru Shri Bharathi Krishna Tirtha.

Data Analysis

Following statistical techniques were used for analysing the data.

Descriptive statistics of performance in Square & Square root for total sample.

The following table shows the measures of central tendency namely mean, median, mode, and measures of variability namely standard deviation of performance in Square & Square rootfor the total score of the sample.

Table 1.1 Descriptive Statistics Of performance in Square and Square root

Test	Sample Size	Mean	Median	Mode	Sd
Pre	32	2.31	2	0	2.2
Post	32	4.15	5	5	1.9

Descriptive statistics of time taken for total sample.

The following table shows the measures of central tendency namely mean, median, mode, and measures of variability namely standard deviation of time taken for the total score of the sample.

Table 1.2 Descriptive Statistics Of time taken for total score of the sample

Test	Sample Size	Mean	Median	Mode	Sd
Pre	32	4.9	5	5	0.30
Post	32	3.75	4	3	1.13

Testing of hypothesis 1

There is no significant difference in the pre-test and post-test scores of students' performance in square and square root after implementation of the Vedic Mathematics technique**.**

The statistical technique used to test this hypothesis was t-test.

The following table shows the significance of difference in the performance of the students for solving the sums in the pre-test and post-test.

Table 1.3Pre-andPost-test differences in the performance of the students

Groups	N	MEAN	SD	t-ratio	l.o.s
Pre	32	2.31	2.2		
Post	32	4.15	1.9	3.68	0.01

Interpretation of 't' from table D

Df = 32 – 2 = 30

Tabulated 't' at 0.01 level = 2.750

The obtained 't = 3.68

3.68>2.75

Conclusion: - The tabulated 't' is less than the obtained 't'. Hence the null hypothesis is rejected. There is a significant difference in the pre-test and post-test scores with respect to the students' performance in square and square root after implementation of the Vedic Mathematics technique**.**

Discussion: - The students knew square roots till 225 but for later squareroot they use to follow the factorization method which was lengthy and many students were not able to do it. The Vedic Mathematics technique equipped them to efficiently solve the sums with lot of practice.

Testing of hypothesis 2

There is no significant difference in the pre-test and post-test time taken by the students for solving the sums of square and square root after implementation of the Vedic Mathematics technique**.**

Table 1.4 Pre-andPost-test differences in the time taken by the students

Groups	N	Mean	SD	t-ratio	l.o.s
Pre-test	32	4.9	0.30		
Post-test	32	3.75	1.13	5.75	0.05

Interpretation of 't' from table D

Df = 32 – 2 = 30

Tabulated 't' at 0.05 level = 2.042

The obtained 't' = 5.75

5.75>2.04

Therefore the 't' is significant at 0.05 level. Hence the null hypothesis is rejected.

Conclusion:-

The tabulated 't' is more than the obtained 't'. Hence the null hypothesis is rejected. There is asignificant difference in the pre-test and post-test time taken by the students for solving the sums of square and square root after implementation of the Vedic Mathematics technique**.**

Discussion

As students took lesser time to solve the sums in the post test, it clearly indicates that the Vedic mathematics technique for square and square roots was more effective and less time consuming. It definitely has helped to enhance the students speed in solving the sums.

Major Findings of the study

There is a significant difference in the pre-test and post-test scores with respect to the students' performance in square and square root after implementation of the Vedic Mathematics technique**.** Thus,students could solve more number of sums accurately making lesser errors by using the Vedic Mathematics technique in comparison to the traditional factorisation method for square and square roots.

There is a significant difference in the pre-test and post-test time taken by the students for solving the sums of square and square root after implementation of the Vedic Mathematics technique**.**Thus,students took lesser time to solve by using the Vedic Mathematics technique in comparison to the traditional of factorisation method for square and square roots.

Suggestions

Teacher can use the Vedic Mathematics Techniques as it helps to:

1. Eliminate the fear for Mathematics.
2. Saves a lot of time, as calculations are much easier and faster. Definitely these techniques would be handy for the students during exams and particularly for the competitive exams which are time bound.
3. Reduces errors as they have minimum steps to solve.
4. Students are able to master the computational skills by using the mental methods and thereby reducing the dependency on devices like calculators, computers etc.
5. It sharpens the mind, increases mental ability, intelligence and develops Left & Right Sides of the brains by increasing visualization and concentration abilities. Which is one of the most important value of included the subject of mathematics in the school curriculum.
6. It helps to carry out tedious and cumbersome mathematical operations in a simple way.
7. India has a rich background of Vedic Mathematics and we need to preserve it and use it to the best of students need. Why burden and confuse the students with long and complex calculations when we have the most fascinating technique to make life much easier for the students.

Conclusion

One can learn Vedic Mathematics from an early age and basic knowledge of multiplication table helps a student to better grasp the subject. When you use Vedic Maths you use both your left and the right brain hemisphere. The left side of the brain is the seat of language and processes in a logical and sequential order. The right side is more visual and processes intuitively, holistically, and randomly which boosts memory and concentration.Since you are doing calculations mentally without the use of pen or paper you are actually concentrating which develops the concentration abilities.

Thus, Vedic Mathematics is nothing but few 'tricks' that helps in solving mathematical calculations quite easily. It is a unique technique of calculations that is based on simple principles and rules, applying which, any kind of mathematical problems can be solved orally.More and more use of Vedic Math can without any doubts generate interest in a subject that is generally dreaded by children.

References

B.K.Tirthaji (1965). VEDIC MATHEMATICS OR Sixteen Simple Mathematical Formulae from the Vedas. Indologlcal Publishers & Booksellers, Delhi.

A.P.Nicholas, J.Pickles&K.Willams (1982). Introductory Lectures on Vedic mathematics. Paperback, Delhi

K.R. Willam (2005). Vedic Mathematics Teacher's Manual. MotilalBanarsidas, Delhi