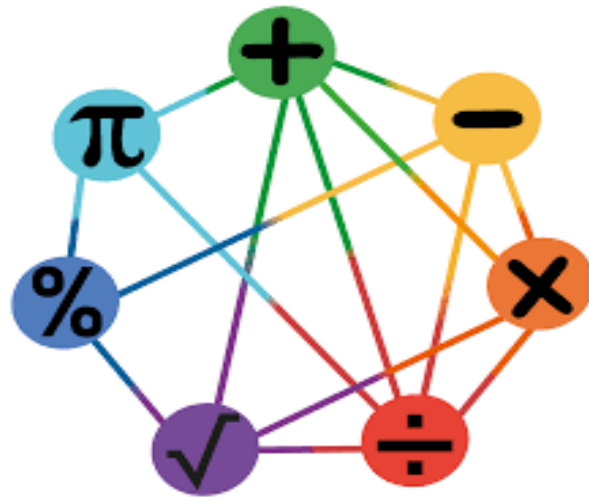




A Study on Effect of Teaching Vedic Mathematics on Performance of Students in Mathematics Subject in Government Schools of Haryana



**STATE COUNCIL OF EDUCATIONAL
RESEARCH AND TRAINING HARYANA
GURUGRAM**

Research Report

**A Study on Effect of Teaching Vedic Mathematics on
Performance of Students in Mathematics Subject in Government
Schools of Haryana**

Submitted by

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Director's Message



NEP- 2020 envisions an education system rooted in Indian ethos that contributes directly to transforming India, sustainably into an equitable and vibrant knowledge society, by providing high-quality education to all, and thereby making India a global knowledge superpower. The Policy envisages that the curriculum and pedagogy of our institutions must develop among the students a deep sense of respect and bonding with one's country. In order to achieve the objectives of education, the classroom transaction processes also needs to be re-defined.

"Vedic Mathematics" is a system of reasoning and mathematical working based on ancient Indian teachings. Vedic mathematics, simplifies arithmetic and algebraic operations and has increasingly found acceptance across the world. On the basis of researches done in the past, SCERT Haryana planned to provide training to teachers in Vedic Mathematics and study its effect on the performance of students.

The REAP Cell, SCERT Haryana always conducts valuable researches on various government policies and initiatives. The study conducted by REAP Cell on the topic- **Effect of Teaching Vedic Mathematics on Performance of Students in Mathematics Subject in Government Schools of Haryana** provides a detailed comparison of the performance of students from schools having at least one math teacher trained in vedic mathematics with the performance of students from schools where the teachers were not trained in Vedic Mathematics.

I am much satisfied that the researcher is able to analyse the current situation and provide suggestions to improve it. I also congratulate all ARAs and the DIET Lecturers who collected data for the study. I also appreciate the school Principals, teachers and students who cooperated with the surveyors and provided the required information. With legitimate pride, I present this report in a generic form before the academic fraternity.

Sh. Vivek Kalia
Director
SCERT Haryana

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Executive Summary

Vedic Mathematics originated from “Atharva Vedas” which deals with the branches like Engineering, Mathematics, Sculpture, Medicine, and all other sciences. It introduces the wonderful applications to Arithmetical computations, theory of numbers, compound multiplications, algebraic operations, factorisations, simple quadratic and higher order equations, simultaneous quadratic equations, partial fractions, calculus, squaring, cubing, square root, cube root and coordinate geometry etc. It is a system of reasoning and mathematical working based on ancient Indian teachings. It is fast, efficient and easy to learn and use. It saves time and improves the interest in learning more applications of mathematics.

It is often observed in classrooms that the students fear Mathematics and try to avoid it due to inefficiency in carrying out long multiplication, division etc. Hence, SCERT Haryana planned to implement Vedic Mathematics in Government schools of Haryana from class VI – X. For this purpose, SCERT and BSEH decided to train selected teachers across the state.

The present report titled- **A Study on Effect of Teaching Vedic Mathematics on Students’ Performance in Mathematics Subject in Government Schools of Haryana** aims to assess the effect of these trainings on performance of students in Mathematics subject. The performance of students in schools where the teachers were trained in Vedic Mathematics was compared with the performance of students where the teachers were not trained in Vedic Mathematics by SCERT/BSEH.

Objectives: The study had the following objectives-

- To compare the performance (in Math subject) of students taking classes in Vedic mathematics with the performance of students not taking such classes on the basis of-
 - a) Comparison of mean scores of marks obtained by students on the basis of teacher training
 - b) Results of students from session 2018-19 to 2020-2021
- To study the effect of teacher training in Vedic Mathematics on-
 - teaching of Mathematics subject
 - interest among students
 - number of students opting for Math subject in class XI
- To know about the problems faced by teachers in teaching Vedic Mathematics

Hypothesis:

A hypothesis is an assumption, an idea that is proposed for the sake of argument so that it can be tested to see if it might be true. The following hypothesis was proposed to study the first objective-

Objective: To compare the performance (in Math subject) of students taking classes in Vedic mathematics with the performance of students not taking such classes on the basis of-

a) Comparison of mean scores of marks obtained by students on the basis of teacher training

Hypothesis: There is no significant difference in the mean scores of marks obtained of students on the basis of teacher training.

Methodology:

For the survey, 4 schools were selected from 2 blocks in each district. The survey was conducted in 88 senior secondary schools, 44 with trained teacher in Vedic Mathematics and 44 without trained teacher in Vedic Mathematics. The students of Class IX and X (taking 5 students per class) were selected randomly leading to a sample of 880 students across the state. For collecting primary data, tools were prepared to include all the concerned stakeholders, i.e. School Head, Math teacher and students. Thus, the tools developed included - Interview Schedule for School Heads and Math teacher and Questionnaires for students. The student questionnaire included problems based on simple mathematical calculations which can be easily solved using the techniques of Vedic Mathematics. The purpose of these questions was to observe whether the students use the techniques of Vedic Mathematics for solving the questions or use the conventional method for calculations.

The data was collected from the sample schools with the help of 22 surveyors across the state including ARAs and DIET Lecturers. The surveyors were trained for collecting the information during the tool training programme held on Nov 16, 2021. Each surveyor was given sets of survey instruments and was asked to fill the data from the sample schools allotted to the surveyor as per the instructions given with the survey tool. Both qualitative and quantitative data was collected from the stakeholders

Major Findings of the Study:

➤ Comparison of Performance (in Math subject) of Students taking classes in Vedic Mathematics with the performance of students not taking such classes

- Percentage of schools where more than 50% students scored greater than equal to 50% marks have shown increase from session 2018-19 to session 2020-21 for class IX in both type of schools i.e. whether the teacher was trained in Vedic Mathematics or not, the trends of scores are similar.
- In Class X, the percentage of schools with more than 50% students scoring $\geq 50\%$ marks; first decreased from session 2018-19 to session 2019-20 and then increased in session 2020-21 in both type of schools. This indicates that the performance of students of class X is similar in both type of schools.
- 53% students from schools with trained teacher in Vedic Mathematics know about the shortcut techniques of fast calculations whereas 41% students from schools without a trained teacher in Vedic Mathematics (by SCERT/HBSE) also know about these techniques. This suggests that vedic techniques are being used by teachers in both type of schools.
- The number of students qualifying NTSE was found to be more in schools where teachers were **not trained in Vedic Mathematics**.
- Percentage of students who have applied Vedic techniques in solving the problems is similar irrespective of the type of school (whether the teacher was trained in Vedic Mathematics by SCERT/BSEH or not).
- No student from any of the schools could apply Vedic techniques in all the given problems.
- There is no significant difference in the mean scores of marks obtained of students from schools with trained teacher in Vedic Mathematics and the mean scores of marks of students from schools without a trained teacher in Vedic Mathematics

It was observed that no student from any of the schools could apply Vedic techniques in all the given problems. Also there was no significant difference in the mean scores of marks obtained of students from schools with trained teacher in Vedic Mathematics and the mean scores of marks of students from schools without a trained teacher in Vedic Mathematics. The results of school exams were also found to be similar in both types of schools.

➤ **Implementation of Vedic Mathematics in Schools:**

- According to School Heads, 57% of the schools with trained teacher in Vedic Mathematics have not received any guidelines regarding its implementation in schools.
- 49% (43 school Heads) of the School Heads have accepted that their teachers use the techniques of Vedic Mathematics to improve the interest as well as performance of students in Mathematics subject.
- According to School Heads, 64% of the teachers have received training in Vedic Mathematics in Face-to-Face mode while others have received through online mode. Also the duration of training is not same for all teachers.
- 57% teachers have received reference material for studying about Vedic Mathematics.
- Among the teachers who received training in Vedic Mathematics, 59% of them received from SCERT/BSEH and others received it by DIETs.
- Mathematical play related to Vedic Mathematics was conducted in only 7% schools with teachers trained in Vedic Math.
- 77% of teachers who were not trained in Vedic Mathematics wish to take such training in future.
- 96% of the School Heads agreed that it would be beneficial to include the techniques of Vedic Mathematics in school curriculum. Majority of students in both type of schools consider Vedic Mathematics to be beneficial.
- In the schools with trained teacher in Vedic Mathematics, 62% students accepted that their teacher discussed about Vedic Mathematics in their class. On the other hand, from the schools without any trained teacher by SCERT/BSEH, 36% students have still heard about Vedic Mathematics in their class.

It was found that guidelines were not communicated to teachers with regard to implementation of Vedic Mathematics in schools. Many teachers who did not receive training from SCERT/HBSE were also found using these techniques in their class. The duration of the training and mode of training received by different teachers was different. Majority of School Heads, teachers and students were found to be in favour of including Vedic Mathematics in curriculum.

➤ **Effect of Teacher Training in Vedic Mathematics on Teaching-Learning Process:**

- All the teachers accepted that Vedic Mathematics improves calculation speed.

- 82% teachers agreed that it helps in understanding the subject more deeply and improves interest in Mathematics.
- 84% teachers are in favour of including Vedic Mathematics in curriculum.
- 73% teachers agreed that Vedic Mathematics helps to overcome the challenges faced by students in understanding Mathematical concepts.
- In majority of schools (either with trained teacher in Vedic Mathematics or without trained teacher in Vedic Mathematics), less than 25% students enrolled in Class X, opted for Mathematics subject in Class XI.
- 89% students from schools with trained teacher in Vedic Mathematics and 91% students from schools without trained teacher in Vedic Mathematics, agreed that Vedic Math is interesting.

It can be seen that most of the teachers and students agreed that Vedic Mathematics techniques are interesting and improve calculation speed which make the subject interesting for students. They are in favour of including it in school curriculum. Also the training of teachers in Vedic Mathematics does not seem to have any effect on the choice of students with regard to taking Math as a subject in class XI.

➤ **Challenges Faced in Implementation of Vedic Mathematics in Schools:**

- The major challenge in implementation of vedic mathematics in schools is that it is not a part of school curriculum. Though it is found in the survey that all school heads believe Vedic mathematics to be beneficial, but they cannot implement it as it is not included in curriculum and there are no clear guidelines about its implementation.
- Another important challenge is that SCERT Haryana and BSEH have provided training to selected teachers and so all teachers are not able to implement it.

It can be said that the implementation plan should have been prepared well and its execution should have been monitored to achieve better results. Clear guidelines shall be given to schools for effective implementation of the initiative.



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