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Effectiveness of Vedic Algorithm for Enhancing Competency in Multiplication

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Abstract:- The present study was conducted to find out the effectiveness of Vedic Algorithm for enhancing competency in multiplication at secondary level. Experimental method was used for this study. One -group pre -test post -test design was applied for this study. The study was conducted on a sample of 30 students of Kerala state syllabus. A multiplication ability test administered as pre test for checking the ability in multiplication. Time taken and score obtained by the students were checked. After that student were taught with Vedic method. The effectiveness of Vedic method in enhancing the competency in multiplication was found by administering the same test as post-test. The data collected were tabulated and analyzed statistically. The study reveals that there is a significant difference in the time taken by the students to complete the test before and after treatment for total sample and sub sample. The time taken by the students after treatment is less than before treatment. The study also reveals that a significant difference exists in the mean score between pre-test and post-test for total sample and sub sample based on gender. Mean score obtained by the students after treatment is greater than before treatment.

Keywords:- *Vedic Algorithm, Competency in Multiplication.*

I. INTRODUCTION

Education is a process that enlightens, civilizes, refines and empowers people towards a better life. Education helps people develop comprehensively. It allows students to develop thinking skills and positive attitudes towards learning. “The curriculum aims to enable learners to acquire knowledge, promote understanding and integrate positive skills, values, attitudes and habits that are conducive to overall development of their personality” (National School and Education Curriculum Framework, 2005). Including math in the school curriculum helps to develop reasoning abilities, logical thinking and critical analysis.

Learning math is considered by many students to be a difficult problem due to its formulas and processes. Learning to work with numbers, especially mastering mental calculations, improve mental concentrations, develop memory and enhance the ability to retain several ideas at once. If we use an easier method to solve a problem, we can solve it with less chance of making mistake. Here comes the importance of Vedic Mathematics. Vedic method of teaching is one of the easy methods for learning calculations. Also, it provides very easy mental methods along with magic speed and is easy to understand and brings joy in the heart and smile on the face of the students. Hence the investigator proposed to examine the application of Vedic algorithms for enhancing competency in multiplication with a view to suggest suitable measures to be considered for developing multiplication ability among children.

Swaroop Rani (2006) compared the impact of Vedic and conventional methods on the acquisition of numerical abilities in mathematics. The main findings are as follows: (i) The pre-test completion time of the two groups of students was the same. (ii) There is a huge difference in the average time to complete the post-test of the two groups of students. (iii) there is a significant difference in the average speed, accuracy and performance of students after receiving instruction using the Vedic method. (iv) There is no significant difference between the pre- and post-learning outcomes of students taught using conventional methods. (v) There is a significant difference between the two groups of students in calculation ability after treatment. (vi) Students taught using the Vedic method demonstrate better computational ability than students taught using the conventional method. Asha Peter (2006) tried to compare effect of Vedic instructional strategy with that of the conventional method on achievement in Mathematics of eighth standard students. The main findings are (i) Teaching Mathematics through Vedic instructional strategy and conventional method have the same effect on achievement in Mathematics under the category of objective knowledge. (ii) Teaching Mathematics through Vedic instructional strategy was more effective than the conventional method on the achievement in mathematics under the category of objective understanding and Application. (iii) The conventional method is less effective when compared to the Vedic instructional strategy on achievement in Mathematics under the category of objective Problem-Solving Skill. Sunitha, E (2003) experienced the speed and accuracy of 4th grade children in multiplication and division using Vedic math. The sutras used for this calculation are Nikhil am Navata, Scram am Dasatha, Parvatya Yojayet, Urdhva tiryagbhyam. These sutras are said to be considerably more effective than the conventional method in developing not only speed and accuracy but also considerable ability and interest in children when carrying out multiplication and divide. Day Grace (2001) in his study on “The Impact of Vedic Mathematics on the Computational Ability of Experimental and Control Groups. Vedic mathematics is believed to be more effective than conventional methods in developing students' computational

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abilities. Williams, Lynda Pattersan (2000) conducted a study on the effect of drill and practice software on multiplication skills, "multiplication puzzles versus the mad minutes". The purpose of the study was to compare two methods of learning multiplication facts in order to develop speed and accuracy. The result of the study indicated that there was a significant increase in the numbers of problem correctly completed by the treatment group that used 'multiplication puzzles' on computer. Whereas mean scores for the pencil and paper group did not indicate a significant improvement in the development of their multiplication skills. Dipika's (2015) experiment on Vedic mathematics proved the effectiveness of Vedic mathematics and it was found that Vedic mathematics is more effective than the traditional approach. Amulya (2021) shows that the Vedic multiplication method is effective compared to the conventional method in terms of student achievement.

II. METHODOLOGY

The present study is an experimental one on a single group. The same test was conducted before and after the treatment and the effect of the treatment is judged by the difference between the pre test and post test scores and the time taken, which is an appropriate method to achieve the objectives of the study. One group pretest-post test design was used in this study.

A. Sample

The present study was conducted on a sample of 30 students in standard VIII of Pathanamthitta district, Kerala state.

B. Tools

In the present study the following tools were used.

- Lesson transcript based on Vedic method of multiplication (prepared by the investigator)
- Pre test and Post test multiplication ability test (constructed by the investigator)

C. Objectives

- To prepare lesson transcripts for developing multiplication ability based on Vedic method.
- To observe and compare the time taken by the pupils to complete the test before and after experimentation.
- To compare the multiplication ability of the pupil before and after experimentation.
- To compare the boys and girls with respect to their multiplication ability and the time taken to complete the test.
- To suggest a suitable procedure for improving the ability of multiplication based on the findings.

D. Hypotheses

➢ *There is Significant Difference in the Time Taken by the Students to Complete the Test Before and After Treatment with Respect to*

✓ total
✓ boys
✓ girls

➢ *Significant Difference Exists in the Mean Scores between Pre Test and Post Test with Respect to*

✓ Total
✓ Boys
✓ Girls

➢ *There is significant difference in the time taken between boys and girls to complete the pretest.*
➢ *Significant difference exists in the mean pre test scores between boys and girls.*
➢ *There is significant difference in the time taken between boys and girls to complete the post test.*
➢ *Significant difference exists in the mean post test scores between boys and girls.*

E. Need of the Study

In the present scenario of education system, stress has been given to theoretical aspects rather than practical application particularly in the field of mathematics. Most of the students lag behind in calculating mathematics with speed and accuracy. It is the duty of the teacher to provide ample opportunities for developing such qualities among children. Multiplication is a widely used operation next to addition and is a step to higher operations like division and power. In conventional method, pupil take more time for multiplication and also there are chances of making mistakes. To increase speed and accuracy in calculations the conventional method is to be replaced by a simple and quicker method which is easy to understand and convenient to apply. Through review of studies the investigator considered Vedic method of teaching mathematics is feasible and suitable with a view to develop speed and accuracy among students. Since multiplication is a complex process, the investigator concentrates only on multiplication of numbers up to three digits.

F. Limitation of the Study

- Due to lack of time, the study was confined to one division of eighth standard with 30 students.
- Out of sixteen sutras in Vedic mathematics, the investigator had selected three sutras and three sub sutras only.
- Treatment is given only in multiplication by Vedic sutras.

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G. Statistical Analysis

➢ *Hypothesis 1*

There is significant difference in the time taken by the student to complete the test before and after treatment with respect to

- Total sample
- Boys
- Girls

To test the hypothesis, mean and standard deviation of the time taken by the student to complete the test are found and given in table 1.

Table 1: Significance of Difference in the Time Taken by the Students to Complete the Test Before and after Treatment for Total Sample

Treatment	N	Mean Time (Minutes)	S D	Mean Time Difference	t-value	Level of Significance
Before treatment	30	31.77	8.82	10.80	5.77	0.01
After treatment	30	20.97	5.44			

As revealed by the table, the calculated value of 't' (5.77) is greater than that of the tabled value of 't' (2.58) at 0.01 level of significance. So, there is a significant difference in the time taken by the student to complete the test for total sample.

To test the hypothesis, difference between the time taken by boys to complete the test are found and given in Table 2.

Table 2: Significance of difference in the time taken by boys to complete the test before and after treatment

N	$\sum D$	$\sum D^2$	t-value	Level of significance
16	221	3425	11.09	0.01

It is obvious from the table that 't' value (11.09) is significant at 0.01 level. So, there is significant difference in the time taken by the student to complete the test before and after treatment for boys.

To test the hypothesis difference between the time taken by girls to complete the test are found, the details of which are presented in Table 3.

Table 3: Significance of Difference in the Time Taken by the Girls to Complete the Test Before and After Treatment

N	$\sum D$	$\sum D^2$	t-value	Level of Significance
14	103	1197	4.74	0.01

From the table it is seen that 't' value (4.74) is significant at 0.01 level. So there is significant difference in the time taken by the girls to complete the test before and after treatment.

➢ *Hypothesis 2*

Significant difference exists in the mean scores between pre test and post test with respect to

- Total sample
- Boys
- Girls

To test the hypothesis, mean and standard deviation of pre test and post test scores of the students are found and given in Table 4.

Table 4: Significance of Difference in the Mean Scores Between Pretest and Post-Test for Total

Test	N	Mean score	S D	Mean score difference	t-value	Level of significance
Pre test	30	43.53	9.53	5.94	2.83	0.01
Post test	30	49.47	6.64			

It is clear from the table that t-value (2.83) is significant at 0.01 level. So a significant difference exists in the mean scores between pretest and post-test for total.

To test the hypothesis difference between the pre test and post test scores of boys are found and given in Table 5.

Table 5: Significance of Difference in the Mean Scores between Pretest and Post-Test for Boys

N	$\sum D$	$\sum D^2$	t-value	Level of significance
16	111	1689	3.55	0.01

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From the table we can conclude that t-value (3.55) is significant at 0.01 level. So, a significant difference exists in the mean scores between pre test and post test for boys.

To test the hypothesis, difference between the pre test and post test scores of girls are found and the details are given in Table 6.

Table 6: Significance of Difference in the Mean Scores between Pretest and post-test for girls

N	$\sum D$	$\sum D^2$	t-value	Level of Significance
14	67	569	4.10	0.01

Table shows that t-value is significant at 0.01 level. So, a significant difference exists in the mean scores between pre test and post test for girls.

➢ *Hypothesis 3*

There is a significant difference in the time taken between boys and girls to complete the pre test To test the hypothesis, mean and standard deviation of the time to complete the test between boys and girls are found, details of which are presented in Table 7.

Table 7: Significance of Difference in the Time Taken between Boys and Girls to Complete the Pre Test

Gender	N	Mean time	S D	Mean score difference	t-value	Level of significance
Boys	16	34.37	9.20	5.59	1.74	Not significant
Girls	14	28.78	7.59			

As revealed by the table the t-value (1.74) is not significant at 0.05 level of significance. So there is no significant difference in time taken between boys and girls to complete pre test.

➢ *Hypothesis 4*

Significant difference exists in the mean pre-test scores between boys and girls. To test the hypothesis, mean and Standard deviation of scores of boys and girls to complete the pre test are found and given in Table 8.

Table 8: Significance of Difference Exists in the Mean Pre Test Scores Between Boys and Girls

Gender	N	Mean Score	S D	Mean Score Difference	t-value	Level of Significance
Boys	16	41.62	10.3	4.09	1.14	Not significant
Girls	14	45.71	8.32			

Table shows that t-value (1.14) is not significant. So, there is no significant difference in the mean pre test score between boys and girls.

➢ *Hypothesis 5*

There is no significant difference in the time taken between boys and girls to complete the post test.

To test the hypothesis, mean and standard deviation of the time taken by boys and girls to complete the post test are found and given in Table 9.

Table 9: Significance of Difference in the Time Taken between Boys and Girls to Complete the Post Test

Gender	N	Mean time	S D	Mean Time Difference	t-value	Level of significance
Boys	16	20.56	6.0	0.866	0.41	Not significant
Girls	14	21.43	4.89			

It is clear from the table that t-value is not significant at 0.05 level. So there is no significant difference in the time taken between boys and girls to complete the post test.

➢ *Hypothesis 6*

Significant difference exists in the mean post test scores between boys and girls.

To test the hypothesis, mean and standard deviation of scores of boys and girls to complete the post test are found and given in Table 10

Table 10: Significance of Difference Exists in the Mean Post Test Scores Between Boys and Girls

Gender	N	Mean score	S D	Mean score difference	t-value	Level of significance
Boys	16	48.56	6.46	1.94	0.76	Not significant
Girls	14	50.50	6.93			

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Table shows that t-value (0.76) is not significant. So there exists no significant difference in the mean post test scores between boys and girls.

III. MAJOR FINDINGS

- The study reveals that there is significant difference in the time taken by the students to complete the test before and after treatment for total sample and sub sample. That is time taken by the students after treatment is less than before treatment.
- The study reveals that a significant difference exists in the mean score between pre test and post test for total sample and sub sample based on gender. That is mean score obtained by the students after treatment is greater than before treatment.
- The study reveals that there is no significant difference in the time taken between boys and girls to complete the pretest. Boys and girls are alike in the time taken the pretest.
- The study reveals that there is no significant difference in the time taken between boys and girls to complete the post test. That is boys and girls are alike in time taken the post test.
- The study reveals that there is no significant difference in the mean pre test scores between boys and girls. That is boys and girls are alike in mean score obtained in pretest.
- The study pointed out that there is no significant difference in the mean post test scores between boys and girls. That is boys and girls are alike in mean score obtained in post test.

IV. CONCLUSION

The enquiry about the effectiveness of Vedic algorithm reaches the conclusion that it is very effective in increasing speed and accuracy in mathematical calculation. Reduced time and improved score at post test than pre test empowered this argument. Also it is obvious that the use of Vedic algorithm directly promote the competency in multiplication of the pupil irrespective of their gender.

REFERENCES

[1]. Amulya Kumar Behera (2021). “A study on the effectiveness of the Vedic method on multiplication for sixth graders” International journal of creative research thoughts (IJCRT), Vol 9(3), 1204-1210.

[2]. H, Indu & Yogeshwarls (2012) “Effectiveness of Vedic Mathematics Based Instruction on the Attitude Towards Learning Mathematics of Grade III School Students”. IJFANS International Journal of Food and Nutritional Sciences. Vol 11(8) Pp 362-367

[3]. Rani, Swaroop (2006), *Effectiveness of Vedic methods and Conventional Methods on the Acquisition of Numerical Ability in Mathematics.* Journal of educational endeavour. January Pp 46-56.

[4]. Peter, Asha (2006), The Effect of Vedic Instructional strategy on the Achievement in Mathematics of English Standard Students. M. Ed Dissertation, Mount Carmel College of Teacher Education. M G University, Kottayam.

[5]. Kapoor, S K (2006), Vedic Mathematical Skills, New Delhi: Lotus Press