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BRIDGE BETWEEN VEDIC MATHEMATICS AND MATHEMATICS IN DIGITAL ERA

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1. Abstract:

The focus of this paper is to find a bridge between Vedic mathematics and mathematics in digital era. Vedic mathematics is nothing than mathematical techniques based on sixteen formulae and related sub formulae with basic ideas and rules. Whereas, in last few years application of mathematics has been increased in the field of physical sciences, biological sciences, Economics, Commerce, Computer science etc and checking of ability in arithmetical calculations have become key factor for job aspirants, then purpose of this paper is to find out the way of application of Vedic mathematics in this digital era.

2. Introduction:

Vedic mathematics is branch of mathematics and have basic roles in arithmetic operations of addition, subtraction, multiplication, division and also in the study of Calculus, especially derivatives and integration. Vedic mathematics is oldest texts of Hinduism and part of Ancient Indian Culture to date from the early centuries B.C. The text 'Veda' means knowledge. There are four Vedas namely, Yajurveda, Rig-Veda, Athar-Vaveda and Samaveda. Vedic calculations are based on sixteen formulae and related thirteen sub formulae with basic ideas and rules. The job aspirants, who pursuing various competitive examinations, have to face aptitude test or reasoning type questions, but big number of job aspirants always seem stuck and panicked to solve the logical reasoning questions in time. Vedic mathematics is not only collection of some formulae, but also refers mental calculating tool which can calculate very fast without calculator or any other electronic devices. Recently, people find interest in studies on Vedic mathematics due to its simplicity, flexibility and faster calculation with more accuracy. Most of the people find the conventional mathematics as boring and abstract. I am interested to focus on the spirit of Vedic mathematics and its applicability of computing with less effort and time.

3. Literature Review:

In between 1911 and 1918, Vedic Mathematics was popularized with sixteen equations and its sub formulae with basic principles and regulations. Indian mathematician Jagadguru Shri Bharathi Krishna Tirtha developed Vedic Mathematics with his findings in a Vedic Mathematics book which discusses the strategies for mental calculation. That apart, he wrote a number of treatises and books on religion, science, world peace, and social issues. After hearing various issues raised by European scholars regarding mathematics in Vedas, he succussed to reconstruct the ancient mathematical systems known as Vedic Mathematic. Vedic Mathematic is a collection of methods for solving mathematical problems fast and simply. It consists of sixteen Sutras and thirteen Sub-Sutras that may be used to solve problems in algebra, conics, arithmetic, geometry, and calculus. Vedic Mathematics is a mental mathematics methodology [1][4]. In 1981, some British mathematician like Kenneth Williams, Andrew Nicholas and Jeremy Pickles expressed their interest in Vedic mathematics and delivered lectures on it in different places of London by extending the book of Jagadguru Shri Bharathi Krishna Tirtha [6-7]. Krishna Kanta Parajuliet al. also expressed new mathematical methods that are straight forwarded, modest, and one-line solutions to mathematical problems. Basic mathematical operations like as subtraction, addition, division, and multiplication

may be done quickly and verified using Vedic principles, and the results can be obtained and checked in under a minute. Their article is exclusively focused on the unique pattern of Vedic Mathematics' basic operations [1-2]. Ajai Kumar Shukla and colleagues pursued ancient Indian mathematical systems discovered in the early twentieth century from the Atharvaveda (an old Indian book) and also done an experimental study with students from BKT College to evaluate the efficacy of teaching mathematics using both conventional and Vedic methods in terms of student performance in mathematics and they focused eighth-grade math curriculum, such as square, square root, factorization of algebraic expressions, and simultaneous humble equations. Analysing the performance data of both pre and post-test of classes of Vedic mathematics, it was established that performance of the students in arithmetic was much better in post-test. [5][1].

4. Methodology:

The aim of this experiment is to examine whether application of the techniques of Vedic mathematics is helpful for job aspirants. Most of the people use electronic devices to get simple calculation of mathematical problems. Young generation is not exceptional from it and they don't feel to use their brain to get simple numerical calculation. Even they use calculator for two digits multiplication. In most of the competitive examinations, quick solve of numerical problems is important key factor for success and the job aspirants, who are a part of young generation, face problem of solving simple mathematics. The method of theoretical analysis of this paper is based on scientific papers, journals, books etc. In accordance with scope and tasks of research, I have relied upon the survey-based research.

4.1 Research Objectives:

Main objective to find bridge between Vedic mathematics and Recent trends of Mathematics. Secondary object is to check whether methods of Vedic mathematics increase the performance of quick calculation in this digital era.

4.2 Sample:

A survey was done with a group of 86 job aspirants who are pursuing competitive exams.

4.3 Procedure:

A survey questionnaire was administered on 86 job aspirants. It was informed to all participants that their information would be used only for research purpose. There were no right and wrong responses. I relied on data assortment technique and statistical analysis to check the hypotheses.

4.4 Questions asked:

I. Do you get interest in solving numerical problems?
II. Do you face problem to solve numerical problems?
III. Do you use electronic devices to solve numerical problems?
IV. Do you feel comfortable to calculate numerical problems without electronic devices?
V. Do you hear about Vedic mathematics?
VI. Do you know the methods of Vedic mathematics?
VII. Do you apply the methods of Vedic mathematics to solve numerical problems?
VIII. Does it help the job aspirants to solve numerical problem more quickly?
IX. Does it reduce the use of electronic devices to solve the numerical problems?
X. How much time (in minutes) did you take to solve 15 numerical questions correctly before learn of methods of Vedic mathematics?
XI. How much time (in minutes) did you take to solve 15 numerical questions correctly after application of methods of Vedic mathematics?

5. Statistical Analysis:

After collecting the data, percentage of responses in respect of first 9 questions was calculated and also used paired samples t-Test to analyse the responses of last two questions.

5.1 Hypotheses:

Null Hypothesis (H_0): There is no statistical difference between pre and post application of the techniques of Vedic mathematics for a group of job aspirants.

Alternative Hypothesis (H_1): There is a statistical difference between pre and post application of the techniques of Vedic mathematics for a group of job aspirants.

5.2 Data received from Survey:

Table 1: Collected responses in respect of first ten queries:

Questions asked	Positive responses received		Negative responses received	
	Counts in number	Percentage	Counts in number	Percentage
Do you get interest in solving numerical problems?	36	41.9%	50	58.1%
Do you face problem to solve numerical problems?	59	68.6%	27	31.4%
Do you use electronic devices to solve numerical problems?	71	82%	15	18%
Do you feel comfortable to calculate numerical problems without electronic devices?	15	18%	71	82%
Do you hear about Vedic mathematics?	52	60.4%	34	39.6%
Do you know the methods of Vedic mathematics?	40	46.5%	46	53.5%
Do you apply the methods of Vedic mathematics to solve numerical problems?	38	44.2%	48	65.8%
Does it help the job aspirants to solve numerical problem more quickly?	38	44.2%	48	65.8%
Does it reduce the use of electronic devices to solve the numerical problems?	35	40.7%	51	59.3%

Table 2: Collected information (time) in respect of last two queries and provided by those 29 job aspirants who apply the methods of Vedic mathematics to solve numerical problems.

Sr. No.	Pre-application of the techniques of Vedic mathematics for job aspirants. (a)	Post-application of the techniques of Vedic mathematics for job aspirants. (b)	Difference d=(a-b)	d^2
1	23	21	02	004
2	30	25	05	025
3	32	25	07	049
4	40	29	11	121
5	25	20	05	025
6	28	25	03	009
7	28	22	06	036

5.4

8	32	27	05	025
9	30	26	04	016
10	30	23	07	049
11	36	24	12	144
12	23	21	02	004
13	32	22	10	100
14	32	19	13	169
15	35	28	07	049
16	35	24	11	121
17	40	25	15	225
18	40	27	13	169
19	34	20	14	196
20	35	23	12	144
21	35	30	05	025
22	35	31	04	016
23	40	32	08	064
24	40	29	11	121
25	40	26	14	196
26	34	27	07	049
27	22	20	02	004
28	38	28	10	100
29	23	23	00	000
Total			325	2255

Analysis of data received from Survey:

Table 2 provides number of samples (n) =29, $\sum d = 370$, $\sum d^2 = 2622$, $\alpha = 0.05$. Under null hypothesis (H_0) , paired samples t-test has been done and calculated results are as follows: t-value = 9.8, p-value = $1.512e^{-10}$. From statistical analysis, it is found that there is a significant large difference between pre-application of Vedic mathematics (M=32.7, SD=5.7) and post-application of Vedic mathematics (M=24.9, SD=3.5). Since p-value is less than $\alpha = 0.05$, so null hypothesis (H_0) is rejected and therefore, alternative hypothesis (H_1) is accepted. Table 1 shows that more than 68% job aspirants face problem to solve numerical problems and 18% job aspirants feel comfortable to calculate numerical problems without electronic devices, but only 40 job aspirants know the methods of Vedic mathematics to solve numerical problems quickly, but 38 out of 40 i.e., 95% job aspirants, who know the methods of Vedic mathematics, got help of Vedic mathematics to solve numerical problems faster than other traditional methods.

6. Conclusions:

This is the modern era of digitization. Digital devices are much faster than humans with nearly zero error rates. Young generation feel use of digital devices to solve simple numerical problem which weak their mental activities. In this paper, statistical analysis proved that techniques or methods of Vedic mathematics significantly reduce the time duration to solve simple numerical problems as well as it also minimizes the use of electronic devices. Whereas, Vedic mathematics is more than 5000 years old, then its applicability and popularity have not been minimized in this present era and this paper successed to establish a bridge between Vedic mathematics and mathematics in digital era.

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