



## Capacity Building in Fishermen Community through Vedic Mathematics

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### ABSTRACT

Fisher folk form an important community in Kerala, but remain neglected and marginalized in spite of the higher socio-economic progress the state has made as a whole. While we consider fisher folk, they remain isolated from the main stream of development. They remained educationally backward also. It is well known that a rapid growth in educational attainment is the most successful medium for social empowerment of the disadvantaged. The path towards our goal of achieving progress and prosperity of the nation is necessarily through equipping the backward sections through knowledge and skills. They need to be empowered by equipping them with self-sufficiency and existence skills such as Self Confidence, Problem Solving Ability, Logical thinking, Decision Making Power, Computational Speed and Reasoning etc. The present paper throws light on the Supreme power of Vedic Mathematics in enhancing these skills.

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### Introduction

The State of Kerala, India, well known as God's own land is abundantly rich with marine, backwaters, rivers and fresh water resources. Kerala being a maritime State has tremendous potential resources teeming with fish. It is one of the leading maritime states in India. The coast of Kerala provides one of the richest fishing zones in the world. The fishermen resources include both artisanal and mechanized groups. The population of fisher folk of Kerala is about 12 lakhs, which includes 8.46 lakhs in the marine sector and 3.2.lakh in the inland sector. Out of this the number of active fishermen is estimated as 2.54 lakhs, of this 1.91 lakh is in the marine sector. The fishermen settlements are spread over in 222 fishing villages in marine sector. Those who depend upon the marine sector of the State for the livelihood constitutes about 8.46 lakh, which comes to about 2.51% of the State's total population. The number of fishermen households is estimated to be 1.61 lakhs. The number of active fishermen is 1.91 lakh and almost an equal number of people are presently engaged in fishery related activities such as vending, processing and marketing. The density of population in the marine fishing villages works out to 2162 per sq. km as against 819 of the average density of Kerala.

### Fisher Folk Community and Problems of Education

Fisher folk form an important community in Kerala, but remain neglected and marginalized in spite of the higher socio-economic progress the state has made as a whole. While we consider fisher folk, they remain isolated from the main stream of development. Although, Kerala boasts of the highest quality of life in the country as measured by human development indicators, the state's fishing community has largely been left out of the general development experience. For example, the literacy level, educational attainment of fisher folk is much lower than that of the general population (Department of Fisheries, 2005). Other development related indicators such as lack of income-earning opportunities,

poverty and deprivation, insanitary and overcrowded living conditions, lack of access to basic services such as water, sanitation, electricity, poor health conditions amongst men and women, higher infant mortality rates, lower sex ratio and lack of access to health facilities, also show evidence of this neglect and marginalisation of the fisher folk in the state (Asian Development Bank, 2003).

### Review of Literature

One of the most rigorous studies of literacy in fishing communities in South Asia is presented by George and Domi (2002). Their paper is part of a broader study of educational disadvantage (George 1998) and discusses 'Residual Illiteracy' in Poovar Village in Thiruvananthapuram district of Kerala. The broader context of the study is Kerala, where rates of literacy are higher than in many other States of India. This can be attributed to multiple factors including cultural and educational traditions, economic policy and widespread access to schooling. Their in-depth statistical survey of the fishing village used census methods to assess literacy rates of fisherfolk and other occupational groups. They found that literacy rates among the population over seven years of age were 78%, with women's literacy rates (79.6%) being higher than those of men (76.6%). They found that within working adults around two thirds of people were literate, and within the fisherfolk, 53.22% of fishermen were literate, and 43.84% of fish-vending women (ibid., p25-28). George and Domi argue that the literacy rates within fishing communities are low compared with other occupational groups. They cite statistics from Kurien (1995) that indicate that within Kerala in 1981, the literacy rates of fish workers was lower than all working adults as a group (George and Domi 2002:15). They suggest that low rates of literacy are the result of multiple factors (such as community values, economic vulnerability, migration, and male and female child labour in fishing related activities and domestic responsibilities) (ibid. p28). However, they argue that the primary cause of educational disadvantage

is the result of marginalisation: 'the fisherfolk community has remained at the margins of society, geographically, economically, socio-culturally, and politically' (George and Domi p7, citing Kurien and Achari 1998).

### **Need for Empowerment**

One factor leading to the decline of the fishermen's welfare is actually seasonal in nature. In other words it really depends on the climatic periods which sometimes cause to lower the number of fish to be caught. Consequently, the business on fishery processing is in trouble. This even worsens when the fishermen's only way of living is on fishery business in the sense that they do not have other jobs. Hence the income generation is severely uncertain. They remained educationally backward also. Education has been treated as a fundamental human rights enshrined in the Universal Declaration of Human Rights and the International Human Rights Covenants, achieving the rights for the basic education, particularly for the underprivileged sections of the society is not only the obligation of the State, but the biggest moral responsibility. It is well known that a rapid growth in educational attainment is the most successful medium for social empowerment of the disadvantaged. The path towards our goal of achieving Progress and prosperity of the nation is necessarily through equipping the backward sections through knowledge and skills. They need to be empowered by equipping them with self-sufficiency and existence skills such as Self Confidence, Problem Solving Ability, Logical thinking, Decision Making Power, Computational Speed and Reasoning etc. Hence the study focuses on (1) how fishermen can survive in the modern life flavored with rapid growth of technological and industrial revolution; (2) what elements of the foreign culture should be accommodated and integrated into the local knowledge and (3) How the authorities can direct the maintenance and development of the local knowledge and skills collectively attached and obtained from community itself, makes the skill become a potential energy resource to live together peacefully, dynamically in a civil society.

### **Vedic Mathematics, a Suitable Tool for Capacity Building**

Vedic Mathematics offers a new approach to resolving the current crisis in education (Puri & Weinless, 1988; Puri, 1988). It is not simply a collection of new computational techniques; rather, it provides an entirely different approach to mathematical computation, based on pattern recognition (Puri, 1991). It has since been shown that the system is equally applicable to more up-to-date aspects of mathematics both at an elementary level as well as in more sophisticated fields (Nicholas, Williams, & Pickles, 1984). The reason that this is possible relies on the nature of the sutras. They frequently describe how the mind approaches, or deals with, a problem in the earliest way (Puri & Weinless, 1988). The Vedic system teaches this sort of approach systematically rather than leaving it to chance and hence we find a number of different possible methods for any particular sum. This is of tremendous use because it enhances variety of strategy. It also enables the subject to be kept alive by directing the attention towards underlying pattern and relationship (Stoddard, 1962; Starkey & Gelman, 1982). It is a system with mental multi choice procedures, which keep the mind alert and agile. It is a complete and most natural Vedic System, which develop our brain to wonderful levels (Reyes, 1984). Puri points out that the naturalness and ease of Vedic Sutra based computation "brings smiles on the face and joy in the heart" of the students which bring mental strength and

confidence (Puri, 1986). Further, Vedic Mathematics reduces anxiety and increases playfulness.

This spark tempted the investigator to implement Vedic computational strategies in improving computational speed, problem solving ability, and Logical and Reasoning Skills of fishermen community and thereby empower them to be skillful enough in order to meet the situational challenges of life.

### **Brief Profile of Anjuthengu Fishing Village**

Anjengo fisheries village is spread over five wards of Anjengo Gram Panchayat. The village has a total of 2030 houses and 2070 households are living there. Among them, 45 households are landless or presently living as a joint family. About 89.65 percent of the existing houses in the village have sanitary toilets. Safe drinking water is available to 91.18 percent of the existing houses. More than three fourth of the houses in the village (92.31 %) are electrified. The village has one LP School, one high school and higher secondary school. Four anganwadis are functioning in this village. The literacy rate of Anjengo panchayat is 73% (PCO, 1999). The school reports throw light on the fact that the dropout rate is high and the students or even the parents are not at all interested in studies. Parents encourage their children go for fishing related works and earn for daily expenditure. Children are not bothered on their future progress and they often unknowingly indulge in antisocial activities.

Hence the investigator, being a responsible teacher and a social activist has decided to conduct the intervention activities among the community members of Anjengo Panchayat.

### **Objectives of the Study**

The study was conducted among members of Fishermen community. The present study was undertaken with the following objectives:

1. To test the effectiveness of the Supreme power of Vedic Mathematics in enhancing Numerical Ability, Problem Solving Ability and Computational Speed of Fishermen.
2. To equip the Fishermen Community with self-confidence by attaining skills of Numerical Ability, Problem Solving Ability and Computational Speed through Indian intellectual tradition of Vedic Mathematics

### **Hypotheses of the Study**

The following hypotheses were formulated by the investigator to lead the study

1. Vedic Mathematics applications are very much effective in enhancing Numerical Ability, Problem Solving Ability and Computational Speed of Fishermen.
2. Acquisition of the skills of Vedic Mathematics applications is the true solution in equipping fishermen community with self-confidence.

### **Methodology**

#### **Population and profile of the sample**

In this paper the researcher made an attempt to enhance the Numerical Ability, Problem Solving Ability and Computational Speed of Fishermen Community and thereby increase their Self-Confidence. The sample selected were 54 members of Fishermen community of Anjuthengu fishing village of Thiruvananthapuram District of Kerala State, India. The samples were selected using random sampling technique. Arrangements were done to assemble the members at a common avenue with the help of 'Vision Academy', Anchuthengu. Members assembled there every day for duration of one week to attend the class.

**Design, participants and procedure**

The design selected for the study was Pre-test Post-test Single group design. A package of select Vedic Sutras with ‘Ekadhikena Purvena’, Ekanyunena Purvena and Urdhav Tiryagbhyam, pre-tested Numerical Ability Test, Problem Solving Ability Test, Computational speed test were the tools. Before the intervention, a pre-test was conducted among the sample. At the end, Post-Test was administered and the scores were collected. After an interval of 1 month, a retention test was given without any notice. The same tools were used for administering the retention test. Appropriate statistical technique like Repeated ANOVA, LSD test of post hoc comparison were used for testing the impact of Vedic sutras in attaining pre-determined objectives and interpreted accordingly.

**Data Analysis**

**Table 1. Mean values and Standard Deviations of Numerical Ability scores in pre, post and retention tests of Fishermen in experimental group.**

Group	N	Mean	SD
Pre Experimental	54	6.81	2.04
Post Experimental	54	16.66	1.62
Retention Experimental	54	16.61	1.63

**Table 2. Summary of Repeated ANOVA of Numerical Ability scores in pre, post and retention tests of Fishermen in experimental group.**

Group	Source of variation	Sum of Squares	df	Mean squares	F-ratio
Experimental	Between Groups	8025.49	1	4032.74	863.24**
	Between Subjects	686.53	53	3.49	
	Error	1069.18	106		
	Total	9781.20	159		

**Table 3. Results of LSD Test for significance between pairs of mean scores of numerical ability of Fishermen of the experimental group.**

Sl No	Pairs	Mean values	Mean Difference
1	Pre-Experimental Post-Experimental	6.81 16.66	9.85**
2	Pre-Experimental Retention Experimental	6.81 16.61	9.80**
3	Post-Experimental Retention Experimental	16.66 16.61	0.05

\*\* Significant at 0.01 level

**Table 4. Mean values and Standard Deviations of Problem Solving Ability scores in pre, post and retention tests of Fishermen in experimental group.**

Group	N	Mean	SD
Pre Experimental	54	5.21	2.57
Post Experimental	54	17.10	1.52
Retention Experimental	54	16.63	1.67

**Table 5. Summary of Repeated ANOVA of Problem Solving Ability scores in pre, post and retention tests of Fishermen in experimental group.**

Group	Source of variation	Sum of Squares	df	Mean squares	F-ratio
Experimental	Between Groups	9183.07	1	4691.55	1251.00**
	Between Subjects	598.00	53	2.40	
	Error	808.26	106		
	Total	10589.33	159		

\*\*Significant at 0.01 level

**Table 6. Results of LSD Test for significance between pairs of mean scores of Problem solving ability of Fishermen of the experimental group.**

Sl No	Pairs	Mean values	Mean Difference
1	Pre-Experimental Post-Experimental	5.21 17.10	11.89**
2	Pre-Experimental Retention Experimental	5.21 16.63	11.42**
3	Post-Experimental Retention Experimental	17.10 16.63	0.47**

\*\* Significant at 0.01 level

**Table 7. Mean values and Standard Deviations of computational speed scores in pre, post and retention tests of Fishermen in experimental group.**

Group	N	Mean	SD
Pre Experimental	54	19.71	3.68
Post Experimental	54	9.12	0.85
Retention Experimental	54	9.63	0.28

**Table 8. Summary of Repeated ANOVA of Computational Speed scores in pre, post and retention tests of Fishermen in experimental group.**

Group	Source of variation	Sum of Squares	df	Mean squares	F-ratio
Experimental	Between Groups	6213.94	1	3326.97	816.75**
	Between Subjects	510.20	53	4.31	
	Error	1031.39	106		
	Total	7755.53	159		

\*\*Significant at 0.01 level

**Table 9. Results of LSD Test for significance between pairs of mean scores of Computational Speed Test of Fishermen in experimental group.**

Sl No	Pairs	Mean values	Mean Difference
1	Pre-Experimental Post-Experimental	19.71 9.12	10.59**
2	Pre-Experimental Retention Experimental	19.71 9.63	10.08**
3	Post-Experimental Retention Experimental	9.12 9.63	0.51**

\*\* Significant at 0.01 level

**Discussion**

When the results of Analysis of Variance of post-test scores on Numerical Ability Test, Problem Solving Ability Test and Computational Speed Test of participants were taken, the difference between the means was found to be statistically significant (  $F(1,53) = 863.24$ ;  $p < 0.01$  ), (  $F(1,53) = 1251.00$ ;  $p < 0.01$  ) and (  $F(1,53) = 816.75$ ;  $p < 0.01$  ). The result clearly gives the evidences that Vedic Sutras are very effective in enhancing Numerical Ability, Problem Solving Ability and Computational Speed among the sample of study. Research on the effects of Vedic Mathematics on improving Computational Speed includes the works by Nicholas, Williams & Pickles (1984), Hope (1987), Muchlman (1994), and Haridas (2004) who concluded that “ Vedic Mathematics provides very easy, one line, mental and superfast methods”.

**Findings**

1. Vedic Mathematics applications are very much effective in enhancing Numerical Ability, Problem Solving Ability and Computational Speed of Fishermen Community.
2. Acquisition of the skills of Vedic Mathematics applications is the true solution in equipping Fishermen Community with self-confidence.
3. The continuous practice and application of Vedic One line method of computation indirectly empower the Fishermen community in their overall personality development

The emphasis for adult literacy programmes should be on linking literacy and numeracy learning with people's aspirations and real-life contexts for literacy and numeracy use. Even in contexts where there are low levels of literacy it appears that there may be significant motivation for learning, and scope for application that would support people's livelihoods. Assimilation of Vedic Mathematics can contribute much in this venture.

**Conclusion**

Kerala has made substantial contribution to the world fisheries. Lower literacy rate and bad health among the fishing community in the coastal parts of Kerala, reflects the deprivation of the fisher folks and also to some extent explains the cause of their economic backwardness and poverty. Lack of educational attainments deprive these coastal fishermen from the information and exposure of the modern technologies which results in prevailing ignorance among the fisher folks which makes the commercial firms to exploit them. Lack of Numeracy and literacy skills force them to rely upon middlemen for money borrowing and lending purposes which leads to their exploitation in all means. Due to the lack of awareness and computational skill deficiency, these people are being cheated by middlemen, who actually control the fish marketing and management. In order to save them from such a deprived condition, Skill enhancement and thus empowerment is needed.

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