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Attitude Of Primary School Teachers Towards Teaching Mathematics In The Tribal Areas Of Srikakulam District

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ABSTRACT

Mathematics is a challenging and vibrant subject connected to the real world at every level. There is no sphere of life that runs devoid of mathematics. It is a subject appreciated, admired and held high by individuals. Mathematics is not just a study of numbers, nor is simply about calculations. It is not about applying formulae, either. It can perhaps be better described as a field of creation through accurate and logical thinking. Mathematics is an important component of school education. The children at primary stage should be taught the fundamental operations of mathematics. The teachers should lay foundation in basic mathematical operations in the early stages of their growth and development. The teachers at primary stage of education, particularly in rural and tribal areas should teach mathematics in such a way that the children should solve simple mathematical problems using logical thinking and reasoning. The present study is an attempt to explore the attitude of teachers towards teaching mathematics in the primary schools located in the tribal areas under different managements. The researchers used a well-developed questionnaire as the tool for collection of data from a sample of 120 secondary grade teachers from 30 selected primary schools located in the tribal areas of Srikakulam District in Andhra Pradesh using Stratified Random Sampling technique. The data were analyzed using mean score values, standard deviations and independent t-tests. The findings of the study revealed that the demographic variables – Gender and Professional qualification have no influence on the attitude of primary school teachers towards teaching mathematics. However, Teaching Experience has a significant positive influence on their attitude towards teaching mathematics in primary schools. The study suggested that the teachers working in tribal areas need to be exposed to in-service training on innovative practices in teaching mathematics at primary level.

Key Words: Attitude, Primary School Teachers, Teaching Mathematics, Logical thinking, Reasoning.

INTRODUCTION

Education is an effective means of social reconstruction. It is the process of facilitating learning. It helps in the acquisition of knowledge, skills, values, morals, beliefs and habits necessary for the human living. It acts as a catalyst for the growth and development of an individual. It liberates an individual from ignorance, poverty and misery by equipping him with the knowledge and skills necessary for making his life happy and comfortable. It makes him economically independent and well-adjusted in the society.

In the ladder of education, 'school education' is an important segment of the total education system that contributes significantly to the development of the individual. It lays the foundation for a knowledge based society. School education of better quality is the most powerful tool for overall development of the society. The school is considered a miniature society or a social institution, which is entrusted with the responsibility of bringing up the students harmoniously in the community to which they belong. The modern school is not simply a knowledge centre; and the learning experiences should not be limited to the four walls of the classroom. The school should provide varied learning experiences to the students making them participate in curricular, co-curricular and extra-curricular activities. It aims at the all-round development of the child – physical, mental, moral and spiritual.

Spread of quality education among marginalized sections like tribes of the society has become a formidable task in India today. Quality education for tribal children needs to be considered on priority basis not only because of the constitutional obligation, but also for the comprehensive development of the tribal communities in the country. The teachers in tribal areas, particularly those working in Primary Schools, must have a thorough knowledge of tribal life and culture. They should be able to understand the tribal language. Then only they will be able to render their services for the well-being of the children belonging to tribal community. When the researchers approached some of the teachers working in the primary schools located in the tribal areas of Srikakulam district, it has been noticed that most of the teachers do not possess the specialized skills with regard to teaching mathematics for tribal children. Some of the teachers have expressed the problems and challenges they confront with while teaching a subject like mathematics for children in the primary schools located in tribal areas. This motivated the researchers to conduct a study on the attitude of teachers towards teaching mathematics in the primary schools located in the tribal areas in Srikakulam district of Andhra Pradesh.

THE CONCEPT OF 'MATHEMATICS'

Etymologically, the word, 'mathematics' comes from the Greek 'mathema', which, in the ancient Greek language, means 'what one learns' or 'what one gets to know'. The word 'mathema' is derived from 'manthano', for which the modern Greek equivalent is mathaino', both of which mean 'to learn'. In Latin and in English, until around 1700, the term 'mathematics' was more commonly used to mean 'astrology' or sometimes 'astronomy'. The meaning gradually changed to the present one as 'mathematics'. In English, the term, 'mathematics' is used as a singular noun.

Mathematics is the science and study of quality, structure, space and change. Mathematicians seek out patterns, formulate new conjectures and establish truth by rigorous deduction from appropriately chosen axioms and definitions.

There has been a debate over the past several years on the issue whether mathematical objects such as numbers and points exist naturally or wheather they are human creations. The American mathematician, Benjamin Peirce (1890) called mathematics as "the science that draws necessary conclusions" (Grattan-Guinness, I., 1997). On the other hand, Albert Einstein (1921), a German-American Physicist, stated that "as far as the laws of mathematics refer to reality, they are not certain; and as far as they are certain, they do not refer to reality".

According to Oxford Advanced Learner's Dictionary (1991), Mathematics is the Science of numbers, quantity and space, of which arithmetic, algebra, trigonometry and Geometry are branches (Cowie, A.P., 1991). In the words of Richard Courant and Herbert Robbins (1996), "Mathematics is an expression of the human mind, reflects the active will, the contemplative reason and the desire for the aesthetic perfection. Its basic elements are logic and intuition, analysis and construction, generality and individuality".

Mathematics has made considerable contributions to the advancement of other academic fields. In fact, mathematics is often described as the foundation of scientific studies. One of the major characteristics of mathematics is its general applicability. One equation, for instance, can represent a particular phenomenon in physics as well as certain logic in economics. This general nature of mathematical equations enables unified treatment of diverse phenomena in various academic fields.

NATURE AND SCOPE OF MATHEMATICS

Mathematics is a challenging and vibrant subject connected to the real world at every level. There is no sphere of life that runs devoid of mathematics. Mathematics is a subject appreciated, admired and held high by individuals. It reveals hidden patterns that help us understand the world around us. Now much more than arithmetic and geometry, mathematics today is a diverse discipline that deals with data, measurements, and observations from science; with inference, deduction and proof; and with mathematical models of natural phenomena, of human behavior and of social systems.

In the present competitive world, life has become more complex and more mathematical knowledge is needed to understand and adjust to the demands of life. With the increase in scientific inventions and approaches, the value and importance of mathematics has also gained its momentum in the field of education.

Mathematics is a highly valued subject in school curriculum. By learning mathematics, students are able to acquire essential mathematical knowledge, skills, interests and attitudes. Mathematics teaches disciplinary and intellectual values by providing training to mind of the learner and developing intellectual habits. It also helps in understanding the contribution of mathematics in the development of civilization and culture. It imbibes essential social virtues and attributes of morality. The knowledge of mathematics helps students to satisfy their varying interests, which allow them to utilize their leisure time. It also develops international outlook and understanding in students along with the power of thinking, reasoning, concentration, expression etc. Mathematics also contributes in all-round and harmonious development of the personality

CHARACTERISTICS OF MATHEMATICS

Mathematics is an academic discipline of great depth, with a number of unsolved problems. It has progressed on cumulative contributions from countless mathematicians in the world who have tackled those problems while creating new areas of inquiry. Mathematics has made considerable contributions to the advancement of other academic fields. In fact, mathematics is often described as the foundation of scientific studies.

One of the major characteristics of mathematics is its general applicability. One equation, for instance, can represent a particular phenomenon in physics as well as certain logic in

economics. This general nature of mathematical equations enables unified treatment of diverse phenomena in various academic fields. Furthermore, mathematical theorems are no respecter of age or seniority: any theorem has to be proven through appropriate mathematical procedures whether you are a novice student researcher or an eminent professor of mathematics. And once proved true, mathematical theorems will never be reversed. This 'universality'of mathematics is another important feature that allows the discipline to transcend time and space.

OBJECTIVES OF TEACHING MATHEMATICS IN PRIMARY SCHOOLS

The objectives of teaching Mathematics in primary schools are to build foundational skills in numeracy, logical reasoning and problem-solving, while also connecting mathematical ideas to everyday life. The aim is not just rote learning but fostering curiosity, critical thinking and confidence in using mathematics as a tool for communication and decision-making.

The following are some of the key objectives of teaching mathematics in primary schools.

(i) Functional Objectives

Teaching mathematics aims at developing practical skills among students. These skills include:

- **Numeracy skills**: Enable children to perform basic operations (addition, subtraction, multiplication, division).
- **Daily life applications**: Teach children to use mathematics in real-life contexts (money, time, measurement).
- **Problem-solving abilities**: Develop strategies to approach and solve practical problems logically.

(ii) Disciplinary Objectives

Teaching mathematics aims at developing cognitive growth among the students. Cognitive growth includes:

- **Logical reasoning**: Encourage inductive and deductive thinking.
- **Conceptual understanding**: Move beyond memorization to grasp underlying principles.
- **Mathematical language**: Help children communicate ideas using symbols, recognizing patterns and diagrams, solving puzzles etc..

(iii) Cultural and Social Objectives

Teaching mathematics develops broader values among students in primary schools. They include:

- **Universal applicability**: Show mathematics as a global language that transcends cultures.
- **Confidence building**: Reduce math anxiety by making learning enjoyable and accessible.
- **Collaboration**: Promote group activities to foster teamwork and shared problem-solving.

ACTIVITIES TO TEACH MATHEMATICS FOR TRIBAL CHILDREN AT PRIMARY LEVEL

The following are some of the activities that teachers can take up to make tribal children in primary schools understand different concepts of mathematics concretely.

- **Concrete experiences**: The teachers should use manipulatives (blocks, beads, shapes) to make abstract ideas tangible.

- **Connection to surroundings**: The teachers are expected to relate math concepts to children's environment (family, school, community).
- **Progressive abstraction**: The teachers should move gradually from pictorial representation to symbols and formal algorithms.
- **Continuous assessment**: The teachers should integrate evaluation with teaching to monitor progress and adjust methods.

CHALLENGES OF TEACHING MATHEMATICS FOR TRIBAL CHILDREN IN PRIMARY SCHOOLS

Teaching mathematics in tribal primary schools faces deep-rooted challenges such as cultural disconnect, language barriers, inadequate teacher preparation and lack of resources. These issues often result in low engagement, poor learning outcomes, lack of motivation and a negative attitude toward mathematics among tribal children.

The following are some of the challenges in teaching mathematics for tribal children in primary schools.

(i) Cultural Disconnect

- Tribal students often use different number systems and oral traditions rather than written symbols. Standard math curricula fail to connect with their life experiences.
- Everyday problem-solving in tribal communities (measuring, trading, counting, designing) is rich in mathematical thinking, but schools rarely integrate this cultural knowledge.

(ii) Language Barriers

- Instruction is usually in regional or national languages, not tribal dialects.
- Students struggle to understand abstract concepts when taught in unfamiliar languages, leading to disengagement.

(iii) Pedagogical Limitations

- Traditional rote-learning methods dominate, with little emphasis on activity-based or experiential learning.
- Teachers often lack training in culturally responsive pedagogy, making it difficult to bridge the gap between tribal knowledge and formal mathematics.

(iv) Resource Constraints

- Many tribal schools lack mathematics labs, manipulatives, and visual aids.
- Home environments often provide limited support for learning, as parents may not be familiar with formal schooling practices.

(v) Low Learning Outcomes

- National Achievement Survey (NAS 2021) shows tribal students score below national averages in mathematics (41% vs. 44% for Grade 5)
- Districts with high tribal populations (Chhattisgarh, Jharkhand, North-east India) consistently perform poorly in math assessments.

The biggest challenge is bridging the gap between tribal students' cultural knowledge and formal mathematics instruction. Success lies in contextualizing math education—making it relevant to tribal life, delivered in familiar language and supported by hands-on

learning tools. Without this, mathematics will continue to feel alien and intimidating to tribal children.

STRATEGIES TO OVERCOME THE CHALLENGES

The following strategies can be adopted by the teachers to address the challenges of teaching mathematics for tribal children in primary schools.

- **Integrate Tribal Culture:** Use local games, stories, and practices (e.g., counting with natural objects, measuring in traditional ways) to teach math concepts.
- **Activity-Based Learning:** Tools like counting beads, number mats, and culturally relevant manipulative measures have shown success in improving engagement.
- **Teacher Training:** Equip teachers with skills in culturally responsive pedagogy and the Concrete-Representational-Abstract (CRA) approach.
- **Language Support:** Develop bilingual teaching materials that blend tribal dialects with regional languages.
- **Policy Backing:** NEP 2020 emphasizes inclusivity, critical thinking and reduced curriculum load, which can be leveraged to design tribal-friendly math education.

REVIEW OF RELATED STUDIES

A review of the related studies carried out in the field by the earlier researchers has been conducted; and a brief summary of the studies is provided in the following paragraphs.

Murni Sianturi & Dessy Rizki Suryani (2025) conducted a study to identify the knowledge of pre-service primary school teachers about mathematical contents. Within a quantitative methodological approach, 150 respondents (58 Papuans and 92 non-Papuans) were involved in this study. An evaluation was developed to measure their knowledge of mathematics topics at the primary level, particularly the content area of number. Furthermore, strengths and weaknesses within each basic arithmetic operation for Papuan pre-service teachers were also identified. It comprised 30 items that covered fundamental numeracy and problem-solving. This study found that the pre-service teachers' knowledge of mathematical content was low—not exceeding 50 on the scale. Mixed operations and division were challenging for all Indigenous West Papuan pre-service teachers. The teaching department could assist Indigenous pre-service teachers in increasing their capability of mathematical content knowledge. Historical and cultural factors should be considered when designing teaching programs.

Bibhuti Bhusan Rath & Uma Shankar (2022) conducted a study to explore the relationship between socio-economic factors and mathematics achievement among tribal communities. The study aims to understand how various socio-economic variables, such as income, education level, access to resources and cultural context influence the mathematics learning outcomes of tribal individuals. The paper employs a mixed-methods approach, combining quantitative data analysis and qualitative case studies to provide a comprehensive understanding of the factors contributing to mathematics achievement within tribal populations. The findings highlight the need for targeted interventions to address disparities in mathematics education and promote equitable learning opportunities for tribal students.

Minati Panda (2006) conducted a study on teaching mathematics for tribal children. The study reported that the major reason for tribal children doing less well in school

mathematics seems to lie in the way the subject is taught in schools at the primary level. Though tribal communities have an extensive and rich knowledge of mathematics and everyday science, classroom teaching is completely divorced from their experiences. The National Curriculum Framework, 2005 appears to have failed in making an explicit commitment to adopt a cultural perspective on mathematics education that is necessary to protect the self-esteem of tribal children and impart to them a meaningful education.

NEED FOR THE PRESENT STUDY

A major reason for tribal children doing less well in school mathematics seems to lie in the way the subject is taught in schools at the primary level. Though tribal communities have an extensive and rich knowledge of mathematics, classroom teaching is completely divorced from their experiences. The National Curriculum Framework, 2005 appears to have failed in making an explicit commitment to adopt a cultural perspective on mathematics education that is necessary to protect the self-esteem of tribal children and impart to them a meaningful education. If the teachers working in the tribal areas develop a positive attitude and right perceptions towards teaching mathematics to the children in primary schools with an understanding of their cultural background, it would certainly improve the learning abilities of tribal children in a subject like mathematics. Further, the subject should be taught using innovative practices with student engagement in the teaching-learning process. In this context, it is felt by the researchers to explore the attitude of teachers towards teaching mathematics in the primary schools located in the tribal areas under different managements. The present study is an attempt in this direction.

OBJECTIVES OF THE STUDY

The main objective of the present study is to explore the attitude of teachers towards teaching mathematics in the primary schools located in the tribal areas of Srikakulam District.

The study also aims at finding out the influence of certain demographic variables, viz., Gender, Professional Qualification and Teaching Experience on the attitude of teachers towards teaching mathematics for tribal children in primary schools.

HYPOTHESES OF THE STUDY

The following hypotheses have been formulated for the present investigation:

(i) There is no significant difference in the attitude of male and female teachers towards teaching mathematics for tribal children in primary schools.

(ii) There is no significant difference in the attitude of teachers with D.Ed. qualification and those with B.Ed. & above qualifications towards teaching mathematics for tribal children in primary schools.

(iii) There is no significant difference in the attitude of teachers with an experience of less than 10 years and those with 10 years and above towards teaching mathematics for tribal children in primary schools.

LIMITATIONS OF THE STUDY

The study is limited to find out the influence of three socio-demographic variables, viz., gender, professional qualification and teaching experience on the attitude of teachers towards teaching mathematics for tribal children in primary schools.

DELIMITATIONS OF THE STUDY

The study is confined to 120 Secondary Grade Teachers (SGTs) from 30 selected secondary schools located in the tribal areas of Srikakulam District of Andhra Pradesh.

DESIGN OF THE STUDY

(a) Method of Research

Since the present study involves collecting data from the respondents with the help of a survey, the investigators used Descriptive survey method for the present investigation.

(b) Sample

The sample of the study consists of 120 Secondary Grade Teachers (SGTs) working in 30 selected secondary schools located in Srikakulam district of Andhra Pradesh. These teachers were selected using 'Stratified Random Sampling' method. In this method, no significant group is left unrepresented and this gives a greater control over the sample. Here, in addition to randomness, stratification introduces a secondary element of control as a means of increasing precision and representativeness.

(c) .Research Tool

The researchers used a well-developed 'questionnaire' as the research tool for the present investigation. The tool consists of 35 items on different aspects relating to the attitude of teachers towards teaching mathematics for tribal children in primary schools.

(d) Administration of the tool

The tool was initially administered to 20 Secondary Grade Teachers (SGTs) working in Srikakulam town under Pilot study. The measures of reliability, validity and objectivity of the tool have been calculated. Further, the researchers conducted item analysis for the items included in the tool. Out of 35 items selected for the tool, the discriminating power of 30 items is found positive and is observed negative in respect of 5 items. The items whose discriminating power is negative have been rejected; and the final tool consists of 30 items, which are foolproof in all respects. The final tool has been administered to 120 Secondary Grade Teachers (SGTs) working in 30 selected Secondary Schools located in the tribal areas of Srikakulam district in Andhra Pradesh.

(e) Analysis and interpretation of data

The data collected has been analyzed and interpreted using different statistical techniques such as Arithmetic Means, Standard Deviations and t-ratios; and are presented in the following table.

Table showing t-values of different variables relating to the attitude of teachers towards teaching mathematics to the tribal children in primary schools

S. No.	Variable		N	Mean	S.D.	t-ratio	Result
1	Gender	Male Female	70 50	101.93 101.30	26.04 23.31	0.14*	*Not Significant at 0.05 and 0.01 levels

2	Professional Qualification	D.Ed. B.Ed. & above	40 80	103.50 101.75	25.90 27.08	0.34*	*Not Significant at 0.05 and 0.01 levels
3	Teaching Experience	Less than 10 yrs. 10 yrs. & above	90 30	91.39 105.83	23.51 25.79	2.50*	*Significant at 0.05 level

FINDINGS OF THE STUDY

On the basis of the analysis and interpretation of data, the researchers have arrived at the following findings and drawn the conclusions.

1. There is no significant difference in the attitude of male and female teachers towards teaching mathematics for tribal children in primary schools.
2. There is no significant difference in the attitude of teachers with D.Ed. qualification and those with B.Ed. & above qualifications towards teaching mathematics for tribal children in primary schools.
3. There is significant difference in the attitude of teachers with an experience of less than 10 years and those with 10 years and above towards teaching mathematics for tribal children in primary schools.
   The senior teachers with an experience of 10 years and above exhibited better attitude towards teaching mathematics for tribal children in primary schools as compared to their junior counterparts with an experience of less than 10 years.

CONCLUSION

From the findings of the study, it is concluded that 'gender' and 'professional qualification' have no influence on the attitude of teachers towards teaching mathematics for tribal children in primary schools. However, 'teaching experience' has a positive influence on their attitude towards teaching mathematics for tribal children in primary schools, with senior teachers exhibiting better attitude as compared to their junior counterparts.

EDUCATIONAL IMPLICATIONS

(i) The study would help the teachers identify the difficulties of tribal students in learning mathematics in primary schools.

(ii) The present study helps the teachers develop a positive attitude and right perceptions towards teaching mathematics for tribal children in primary schools.

(iii) The study would help the primary school teachers use innovative methods and approaches of teaching mathematics for tribal children in primary schools.

(iv) The study would help the government and policy makers identify the challenges and problems of teaching mathematics in primary schools in tribal areas; and suggest the remedial measures to overcome these problems.

(v) The study would help the Academic Organizations like SCERTs, IASEs and the State Departments of Education to take necessary steps to provide orientation to

the teachers working in primary schools in teaching mathematics effectively for tribal children.

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