

MATHEMATICS EDUCATION AT TERTIARY LEVEL IN MARATHWADA REGION

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This paper is an attempt to study mathematics education at tertiary level . The study was conducted in the Marathwada region wherein 40 senior colleges were selected as sample colleges i.e. 22 colleges affiliated to Dr. Babasaheb Ambedkar Marathwada University, Aurangabad and 18 colleges affiliated to Swami Remanand Teerth Marathwada University, Nanded. A self made attitude scale for teachers and students and a closed form questionnaire for students were used as data gathering tool. The findings of the study revealed that there is dearth of qualified teachers at tertiary level, attitude of teachers and students towards mathematics is positive and there is no significant difference in the attitudes of students of Dr. Babasaheb Ambedkar Marathwada University, Aurangabad & SRTMU, Nanded. As far as teachers are concerned , SRTMU, Nanded teachers have more positive attitude than Dr. Babasaheb Ambedkar Marathwada University, Aurangabad teachers.

KEYWORDS: Mathematics Education, Tertiary Level.

INTRODUCTION

Education is one of the most important sub-systems of a society; this sub-system is strategically very important because it generates both finite and infinite powers. So, education is not something static or stationary but it is a dynamic process. Adam considered education as a bipolar process and its two poles are student and the teacher. John Dewey goes a step further and says that education is a tripolar process and introduced a third element which is as important as the first two i.e. the subject matter or the curriculum. This subject matter will be in the hands of the teacher and the teacher helps the student in the process of development by imparting knowledge of different branches i.e. subjects. Different subjects are taught in educational institutions such as languages, social sciences, science, mathematics etc. that leads to the development of different domains of a child's personality. Each branch of knowledge deserves their due position in the curriculum at different levels. Languages, social sciences, science & mathematics are made compulsory till standard X. After X students enter the higher secondary level, where they select streams like Science, Arts and Commerce and group of subjects in particular stream according to their interest and utility for higher education. After completing the higher secondary level students join different professional

degree or diploma courses and the remaining students attend college at the tertiary level.

Selection of subjects by students at the tertiary level depends on (a) Conceptual knowledge (b) Interest in the subject (c) Ability to do hard work according to the subjects demand. Even though mathematics is considered as a science of all sciences and art all arts, low strength is found in mathematics classes as compared to other subjects. Thus the present paper aimed to study mathematics education at tertiary level in Marathwada Region. Mathematics has been recognized as one of the cultural strands of human intellectual activity. It has its roots in every day activities and forms the basic structure of our highly advanced technological development. Mathematics has a cumulative growth from prehistoric times.

REVIEW OF RELATED LITERATURE

Badani (1973) constructed a scale for measuring attitude of college students towards education. Lalithamma (1975) studied some factors affecting achievement of secondary school pupils in mathematics and found that achievement in mathematics is positively related to intelligence, interest, study habits and socio-economic status. Mishra (1978) studied attitude of secondary school students of municipal corporation schools towards mathematics, the findings reveal that SES, type of institution attended earlier, study facilities and parents' qualification have impact on the attitude of boys and girls towards mathematics. Jain and Burad (1988) have found the following causes responsible for low result in mathematics in Rajasthan as non-availability of mathematics teachers, transfers of teachers, irregular attendance, and lack of appropriate infrastructure. Yadav (1988) has found that there was no difference in the attitude towards mathematics with regard to gender, experience and class taught.

NEED AND SIGNIFICANCE OF THE STUDY

Mathematics has always been considered important subject in the school curriculum and the teaching and learning of mathematics have always been a major concern in education. The term 'Mathematics' may be defined in a number of ways. It is a systematized, organized and exact branch of science. It is the numerical and calculation part of man's life, which helps the man to give exact interpretation to his ideas and conclusions. Roger Bacon defined mathematics as the gate and key of all sciences. Mathematics has played a very important role in building up modern civilization by perfecting all sciences. According to Bhargava's Standard Illustrated Dictionary "Mathematics is the Science of Space and Numbers". This subject enables the individual to study

various relationships between them; it means that this science is a bi-product of empirical knowledge of individual.

Due to its importance in various walks of life it is made compulsory till standard X but traditional mathematics teaching has been found to yield unsatisfactory results. Students prefer to opt for other subjects after X alternate to mathematics either due to lack of interest or finding it difficult. Strength in mathematics classes is low as compared to other subjects. Being a mathematics teacher the researcher wanted to know where the fault lies & how mathematics is taught in the colleges hence, attempt is made to study mathematics education at tertiary level in the Marathwada region.

OBJECTIVES OF THE STUDY

The objectives of the present study are:

- 1) To study mathematics education at territory level
- 2) To study the nature of qualification of mathematics teachers teaching at tertiary level.
- 3) To find out the attitude of mathematics teachers towards mathematics.
- 4) To find out the attitude of students towards mathematics.
- 5) To analyse the methods adopted by teachers to teach mathematics at tertiary level in Marathwada region.

HYPOTHESES OF THE STUDY

- 1) There is a dearth of NET or SLET qualified teachers teaching mathematics at tertiary level.
- 2) Teachers attitude towards mathematics is neutral (neither negative nor positive)
- 3) Attitude of students towards mathematics is neutral (neither negative nor positive).
- 4) There is no significant difference in the use of teaching method by teachers.

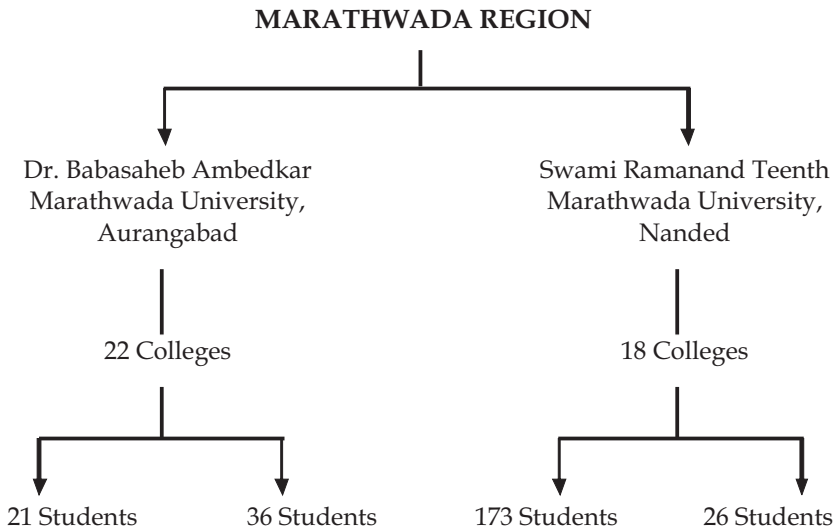
METHODOLOGY

The investigators followed the "survey" method for the present study. The tools used were distributed among the students and teachers of the senior colleges and teachers under jurisdiction of Dr. Babasaheb Ambedkar Marathwada University, Aurangabad and Swami Ramanand Teerth Marathwada University, Nanded. The data collected from the students and

teachers was tabulated and analysed.

SAMPLE

For the purpose of this study 60 teachers and 384 students from 40 colleges affiliated to Dr. B.A.M.U. Aurangabad & SRTMU, Nanded were selected as sample.



TOOL USED

An Attitude Scale was developed by the investigators to study the attitude of teachers and students towards mathematics. The scales were based on Likert method of summated ratings, which covers three major factors as: intrinsic aspect, methods adopted and facilities provided by the college. A questionnaire containing 10 statements was prepared to collect information from the students; students were expected to respond as Yes or No. The investigators sought expert opinion regarding the difficulty level of each test scale and after having the feedback necessary changes were made. Then the tools were administered on the sample of 10 teachers and 40 students from senior colleges to ascertain the necessary information and that no information was vague. After having ascertained that all the items in the two languages were having similar difficulty level, these were administered to the selected sample.

RESULTS

Table 1
Qualification of Teachers Selected for the Study

Sr. No.	Qualification	Dr. B.A.M.U. A'bad.	SRTMU Nanded	Total
1	M.Sc.	12 (20.00%)	06 (10.00%)	18 (30.00%)
2	M.Sc. B.Ed.	09 (15.00%)	15 (25.00%)	24 (40.00%)
3	M.Sc., M.Phil., Ph.D.	07 (11.67%)	04 (6.67%)	11 (18.33%)
4	M.Sc. NET / SLET	06 (10.00%) 34 (56.67%)	01 (1.67%) 26 (43.33%)	07 (11.67%) 60 (100%)

Table 1 shows the qualification of teachers teaching mathematics at tertiary level in Marathwada region. In the total sample 30% teachers are with the qualification M.Sc. Out of which 20% are from Dr. BAMU, Aurangabad and 10% from SRTMU, Nanded. 40% teachers are M.Sc., B.Ed. out of which 15% from Dr. BAMU, Aurangabad and 25% from SRTMU, Nanded. 18.33% teachers are M.Sc., M.Phil., Ph.D. with 11.67% from Dr. BAMU, Aurangabad and 6.67% from SRTMU, Nanded. While the lowest value is 11.67% showing the qualification M.Sc., NET/SLET with 10% from Dr. BAMU, Aurangabad and 1% from SRTMU, Nanded. The data presented in Table 1 proves Hypothesis 1 i.e. there is a dearth of NET/SLET qualified teachers teaching mathematics.

Table 2
 χ^2 Values for Attitude of Teachers and Students Towards Mathematics.

Item No.	χ^2 values (Teachers)	Significant at 4 df.	Item No.	χ^2 values (Students)	Significant at 4 df.
1	290.00	Significant	01	766.32	Significant
2	73.82		02	550.14	
3	63.15		04	407.84	
4	61.16		05	188.81	
15	96.99		06	190.81	
17	84.49		08	611.05	
18	84.66		12	434.51	
31	52.82		14	511.79	
32	57.32		15	355.25	
			17	267.01	

It is clear from Table 2 that χ^2 value for all the items related with intrinsic aspect of teachers and students which are helpful to study the attitude towards mathematics are much greater than the table value at 4 degree of freedom (9.48) at 0.05 level of confidence. Hence, difference between observed and expected frequency is significant. Hence, Hypothesis 2 & 3 are rejected and it can be concluded that the attitude of teachers and students at tertiary level is positive.

Table 3
t-Value of Attitude of Teachers of Both the Universities

Variable	Group	N	Mean	S.D.	t	df	df at 0.05 level	Significance
Attitude of Teachers Towards Mathematics	Dr. BAMU, A'bad.	34	36.2	3.29	2.38	58	2.00	Significant
	SRTMU Nanded	26	38.4	3.75				

The obtained t-value is 2.38, which shows that there is a significant difference between the attitude of teachers of Dr. Babasaheb Ambedkar Marathwada University, Aurangabad and SRTMU, Nanded and the attitude of SRTMU, Nanded is rather more positive than Dr. Babasaheb Ambedkar Marathwada University, Aurangabad.

Table 4
t-Value of Attitude of Students of Both the Universities.

Variable	Group	N	Mean	S.D.	t	df	df at 0.05 level	Significance
Attitude of Students Towards Mathematics	Dr. BAMU, A'bad.	211	36.93	19.17	0.29	382	1.97	Not Significant
	SRTMU Nanded	173	37.53	20.50				

The t-value of 0.29 indicates that difference is not significant at 0.05 level and hence it can be concluded that there is no significant difference in the attitude of students towards mathematics of Dr. Babasaheb Ambedkar Marathwada University, Aurangabad and SRTMU, Nanded.

Table 5
t-Value Regarding Methods Adopted by Teachers to Teach Mathematics at Tertiary Level.

Variable	Group	N	Mean	S.D.	t	df	df at 0.05 level	Significance
Methods Adopted to Teach.	Dr. BAMU, A'bad.	34	47.38	3.98	0.08	58	2.00	Not Significant
	SRTMU Nanded	26	47.27	5.46				

Table 5 shows that the calculated t-value is 0.08 which is smaller than the table value at 0.05 level of significance. Hence, the null hypothesis is accepted. It is concluded that there is no significant difference in the mean scores regarding methods adopted to teach mathematics at tertiary level in both the universities of the Marathwada Region.

FINDINGS OF THE STUDY

- 1) Majority of the teachers teaching mathematics at tertiary level in Marathwada Region are not qualified as per norms.
- 2) Teachers teaching mathematics at tertiary level have positive attitude towards the subject.
- 3) The attitude of teachers of the SRTMU, Nanded towards mathematics is more positive than the teachers teaching mathematics under the Dr. Babasaheb Ambedkar Marathwada University, Aurangabad.
- 4) Students learning mathematics at tertiary level have positive attitude towards mathematics. Hence, they opt for the subject.
- 5) There is no significant difference in the attitude of students towards mathematics of Dr. Babasaheb Ambedkar Marathwada University, Aurangabad & SRTMU, Nanded.
- 6) There is no significant difference in the methods adopted by teachers to teach mathematics at tertiary level in Dr. Babasaheb Ambedkar Marathwada University, Aurangabad and SRTMU, Nanded.

CONCLUSION

The present study shows that there is dearth of qualified teachers at tertiary level for Mathematics teaching in Marathwada Region but those who are dealing with the classes have positive attitude towards the subject. Strength in mathematics classes at tertiary level is low. There is a need to plan and adopt the strategies by the teachers, which motivate the students to opt for Mathematics as a subject. Reasons for low strength should be identified and a plan should be drafted to overcome the weaknesses. Teachers should select, organize and use learning resources intelligently; they should correlate mathematical concepts with day today life experiences. Diagnostic tests should be administered and counselling sessions should be organized periodically. Analysis of concepts and their applications should be discussed and efforts should be made to cultivate rational thinking and scientific temper amongst the students. Students should try to understand difficult concepts instead of skipping them; they should also refer good reference books apart from their textbooks. Students should be encouraged to participate in group discussions, seminars, and conferences and undertake projects. Execution of such plan requires efforts and cooperation of the institution and strong will and determination on the part of teachers and students.

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