



PERCEPTIONS OF TEACHERS TOWARDS MATHEMATICS TEACHING AT SECONDARY LEVEL.

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Abstract

This article focuses on the Factors contributing for affective mathematics teaching and its relation to student's achievement at secondary schools in Vizianagaram District. This paper mainly concentrated on teachers who handling mathematics perceived high towards substantiality of teaching, Quality of presentations of the teacher were examined. Data were collected through a survey. The questionnaires were administered among the 225 mathematics teachers of secondary schools in vizianagaram District. Subjects were selected from 100 schools, covering 11 rural mandalas (73 schools), 04 urban mandalas (14 schools), 04 tribal mandalas (13 schools) situated in vizianagaram District. The sample of 225 respondents was considered statistically adequate and reliable for all analytical purposes.

Introduction

More possession of knowledge and requisite qualifications gives no assurance to meet the competencies of a good teacher. Due to specifying of the roles and responsibilities of a teacher has to display high order of professionalism both inside and outside of the classroom. No teacher would become competent and proficient in teaching unless a teacher experiences in the field. The teacher should have clear vision of the set objectives. The teacher should execute meticulously whatever is planned. The efficient or proficient or competent teacher should be capable in managing the classroom affairs effectively in both outside and inside of the classroom teaching. Mathematics teachers should possess presentation skills of subject matter at classroom level. The mathematics teachers should be capable in motivating all the students in a classroom.

Key competencies are those of competencies that are needed for performing teaching professional activity include – organizational competence, didactic competence, pedagogical knowledge competence, cognitive – creative competence, psychological competence, evaluative competence, professional development aspects.

In addition, teachers support at all levels has an effect on teaching performance. Application of teachers teaching methods, evaluative practices, creation of good environment in the classroom etc., may have its impact for the improvement of students performance.

According to Amnein and Berliner (2002), "Education is the broadest and hardest to measure, with generalizability or transfer of learning to new situations and tasks being a central characteristic". Marzano, Pickering, and Mc Tighe (1993) tried to describe education from educational goal perspective. According to them, "Although acquiring content knowledge is important, it is perhaps not the most important goal of education".

Teaching of Mathematics is a creative art as well as a science. He must so weave his own design of construction that the learning-objectives are attained and the learner is satisfied. Mathematics has qualities of both art and science. It is imperative that teaching of Mathematics must also reflect those qualities both in content and in practice. Indeed, all teaching is art and science. In teaching of Mathematics the qualities are made obvious Cooney (1999) asserts that "teachers need knowledge of at least three kinds in order to have a chance to be effective in choosing worthwhile tasks, orchestrating discourse, creating an environment for learning and analysing their teaching and children's learning: knowledge of mathematics, knowledge of children and knowledge of the pedagogy of mathematics".

Margolinas, Coulange and Bessot (2005) argue that "a teacher's knowledge is a very significant topic for mathematics education. The teacher should know how to use language effectively in order to transfer knowledge.

Failure to do so only exacerbates the children's problems of mathematics".

Title of the Research:

In this study the problem considered is “A Study on the Factors Contributing for Affective Mathematics Teaching and its relation to Students Achievement at Secondary Level in Vizianagaram District”.

Need and Importance of the Study:

The study contributes to the secondary schools and to the factors also for betterment of education system. The study reveals the perceptions of teachers on the factors which are contributing for affective teaching of mathematics at secondary level. The teachers who teach at secondary level mathematics effectively may influence on the student academic achievement. The students benefit more and understand easily. The factors viz., Substantiality of Teaching, Quality of Teachers Presentations, Receptivity on the Students Ideas and Contribution, Use of Teaching Methods, Use of ICT (Information Communication Technology), Quality of Interaction with Students, Quality of Students Activities, Classroom Environment, Conduct and Return of Evaluation Material, Quality of Appraisal Report, Quality of Assignment enrichment Activities, Students Performance Appraisal, Performance of the Teacher, Professional Development of Teacher, and Problems in the Teaching Mathematics. Nudist may cause for effective teaching. This can help the secondary schools to monitor and ensure an effective system and satisfied workforce.

Review of related Literature

Mabena, N., Mokgosi, P. N., & Ramapela, S. S. (2021) studied on “Factors contributing to poor learner performance in mathematics: A case of selected schools in Mpumalanga province, South Africa”. The investigator revealed that “this research employed a qualitative case study design with observation and semi-structured interviews with a sample of three school management team (SMT) members, six teachers, nine learners, and three parent component members of the school governing body (SGB) to determine factors affecting learner performance in mathematics in the senior phase. The results showed that numerous factors influenced learners’ confidence and performance. The factors found to have an impact on mathematics performance were learner related, such as ill-discipline, language barriers and learner attitudes. Teachers’ factors included lack of pedagogical content knowledge and skill, and lack of appropriate professional training”.

Rosalay (1992) in hi study “relationship between attitude of students towards mathematics and achievement” the investigator noticed that “1) The attitude of high school students towards learning mathematics and their achievement in mathematics were related. 2) Urban girls had a more positive attitude towards mathematics than rural girls. 3) Similarly urban boys had a more positive attitude towards mathematics than rural boys. 4) Girls were higher than boys in their achievement in mathematics. 5) Urban girls were higher than rural girls in mathematics”.

Objectives of the study

1. To study the perceptions of Mathematics teachers towards Substantiality of Teaching basing on their socio-economic variables viz., Gender (Male / Female), Teaching Experience (below 10 / 10 to 20/ above 20) and Locality (Urban / Rural/ Tribal).
2. To study the perceptions of Mathematics teachers towards Quality of Teachers Presentations basing on their socio-economic variables viz., Gender (Male / Female), Teaching Experience (below 10 / 10 to 20/ above 20), and Locality (Urban / Rural/ Tribal).

Hypothesis of the study

1. There is no significant difference in the perceptions of mathematics teachers towards Substantiality of Teaching basing on their socioeconomic variables viz., Gender (Male / Female), Teaching Experience (below 10 / 10 to 20/ above 20), and Locality (Urban / Rural/ Tribal).
2. There is no significant difference in the perceptions of mathematics teachers towards Quality of Teachers Presentations basing on their socio-economic variables viz., Gender (Male / Female), Teaching Experience (below 10 / 10 to 20/ above 20), and Locality (Urban / Rural/ Tribal).

Sample Design and sampling Techniques:

The questionnaires were administered among the Mathematics Teachers of Secondary schools in Vizianagaram district with a view to getting the whole sample base and better results. Subjects were selected from 100 schools covering ten rural mandals (73 schools), four urban localities (14 schools) and two tribal mandals (13 schools) situated in Vizianagaram district. The investigator personally approached and distributed the questionnaires to respondents.

The researcher categorized all the 34 mandals in to three (3) categorize viz., Rural, Urban and Tribal localities, arranged in an alphabetical order. The actual selection of mandals was made by first arranging the mandals alphabetically of Vizianagaram district locality wise and then the mandals were selected by adopting simple stratified random sampling technique. The investigator has selected 225 Mathematics Teachers as sampled respondents.

Tool Description:

The tool consists of 112 items totally. The researcher, selected 15 areas viz., 1) Substantiality of Teaching, 2)Quality of Teachers Presentations, 3)Receptivity on the Students Ideas and Contribution, 4) Use of Teaching Methods, 5) Use of ICT (Information Communication Technology), 6) Quality of Interaction with Students, 7) Quality of Students Activities, 8) Classroom Environment, 9) Conduct and Return of Evaluation Material, 10) Quality of Appraisal Report, 11) Quality of Assignment enrichment Activities, 12) Students Performance Appraisal, 13) Performance of the Teacher, 14) Professional Development of Teacher, and 15) Problems in the Teaching Mathematics. It is an instrument designed for self-rating of the Mathematics Teachers opinion of the degree to which they feel on the perceptions towards Factors Contributing for Affective Mathematics Teaching at

Secondary Level. The statements were given in the questionnaire studied by the investigator against the criterion of its applicability on the perceptions of respondents. Further, they were examined in terms of their suitability the questionnaire was given to experts a preliminary survey was conducted for suggestions, the suggestions given by the experts were taken in to consideration and modified the statements as suggested to measure the reliability of the test. A total score was computed for each respondent by summing up his/her score on each of the 112 items. By using SPSS package, the Chi-Square technique was the statistical method deployed for item analysis. Only 100 items were selected for the final scale. The summated values range from 100 to 500.

Statistical Techniques Used:

The statistical techniques used mainly for analytical purposes were means, standard deviations, 't'-test and 'F'-test (ANOVA) were the technique deployed. To find out inter relationships in between the areas on the perceptions of respondents, product moment correlation coefficients (r) were calculated from obtained scores.

Table - 1: Mean, SD, and 't'/F Values on the perceptions of Mathematics Teachers with respect to Substantiality of Teaching.

Variable	Category	N	Mean	SD	t/'F'-Value	p-value
Gender	Male	164	42.54	3.42	1.99*	0.05
	Female	61	43.25	3.57		
Teaching Experience	Below 10	24	41.83	3.78	3.41*	0.03
	10 to 20	102	43.36	2.79		
	Above 20	99	42.28	3.89		
	ZP	184	42.73	3.53		
	Municipal	23	42.29	3.69		
Locality	Urban	42	42.81	3.29	8.14**	0.00
	Rural	156	43.50	2.93		
	Tribal	27	39.08	5.16		

**Significant at 0.01, *Significant at 0.05 level and NS : Not Significant

Table -1 shows that, the mean perception scores of teachers according to their gender with respect to Substantiality of Teaching, for male category teachers was 42.54, whereas it is for female category teachers was 43.25 and the SD values were 3.42 and 3.57 respectively. The 't'-value was 1.99 and the p-value was 0.05, which was statistically significant at 0.05 level. It shows that, there is a significant difference between the perceptions of teachers based on their gender and female category teachers perceived high towards Substantiality of Teaching than that of male category teachers.

With regard to Teaching Experience, the mean opinion scores of teachers for below 10 years teaching experience was 41.83 whereas it is for the 10 to 20 years teaching experience was 43.36 and it was for above 20 years teaching experience was 42.28 and the SD values were 3.78, 2.79 and 3.89 respectively. The 'F'-value was 3.41 and the p-value was 0.03 which was statistically significant at 0.05 level. It shows that, there is a significant difference among the perceptions of teachers based on their teaching experience and 10 to 20 years teaching experience category teachers perceived high towards Substantiality of Teaching than that of below 10 and above 20 years teaching experience teachers.

With regard to Locality, the mean opinion scores of teachers belong to urban area was 42.81 whereas it is for the rural area was 43.50 and the tribal area teachers was 39.08 and the SD values were 3.29, 2.93 and 5.16 respectively. The 'F'-value was 8.14 and the p-value was 0.00 which was statistically significant at 0.01 level. It shows that, there is a significant difference among the perceptions of teachers based on their locality and rural area category teachers perceived high towards Substantiality of Teaching than that of urban and tribal area category teachers.

Table-2 Mean, SD, and 't'/F Values on the perceptions of Mathematics Teachers with respect to Quality of Teachers Presentations.

Variable	Category	N	Mean	SD	t'/F'-Value	p-value
Gender	Male	164	23.77	1.94	2.01*	0.04
	Female	61	24.12	2.10		
Teaching Experience	Below 10	24	23.67	1.69	2.89*	0.05
	10 to 20	102	24.15	1.75		
	Above 20	99	23.63	2.23		
	Municipal	23	23.82	1.29		
Locality	Urban	42	23.97	1.82	6.52**	0.00
	Rural	156	24.32	1.73		
	Tribal	27	20.92	2.71		

****Significant at 0.01, *Significant at 0.05 level and NS : Not Significant**

Table -2 shows that, the mean perception scores of teachers according to their gender with respect to Quality of Teachers Presentations, for male category teachers was 23.77, whereas it is for female category teachers was 24.12 and the SD values were 1.94 and 2.10 respectively. The 't'- value was 2.01 and the p-value was 0.04, which was statistically significant at 0.05 level. It shows that, there is a significant difference between the perceptions of teachers based on their gender and female category teachers perceived high towards Quality of Teachers Presentations than that of male category teachers.

With regard to Teaching Experience, the mean opinion scores of teachers for below 10 years teaching experience was 23.67 whereas it is for the 10 to 20 years teaching experience was 24.15 and it was for above 20 years teaching experience was 23.63 and the SD values were 1.69, 1.75 and 2.23 respectively. The 'F'-value was 2.89 and the p-value was 0.05 which was statistically significant at 0.05 level. It shows that, there is a significant difference among the perceptions of teachers based on their teaching experience and 10 to 20 years teaching experience category teachers perceived high towards Quality of Teachers Presentations than that of below 10 and above 20 years teaching experience teachers.

With regard to Locality, the mean opinion scores of teachers belong to urban area was 23.97 whereas it is for the rural area was 24.32 and the tribal area teachers was 20.92 and the SD values were 1.82, 1.73 and 2.71 respectively. The 'F'-value was 6.52 and the p-value was 0.00 which was statistically significant at 0.01 level. It shows that, there is a significant difference among the perceptions of teachers based on their locality and rural area category teachers perceived high towards Quality of Teachers

Findings and Conclusions

With regard to Substantiality of Teaching, a significant difference was found among the perceptions of teachers based on their socio-economic variables i.e., Gender, Teaching Experience and Locality. According to their gender, female category teachers perceived high than that of male category teachers. According to their teaching experience, 10 to 20 years teaching experience category teachers perceived high than that of below 10 and above 20 years teaching experience teachers and also based on their locality, and rural area category teachers perceived high than that of urban and tribal area category teachers.

With regard to Quality of Teachers Presentations, a significant difference was found among the perceptions of teachers based on their socioeconomic variables i.e., Gender, Teaching Experience and Locality. According to their gender, female category teachers perceived high than that of male category teachers, whereas to their teaching experience, 10 to 20 years teaching experience category teachers perceived high than that of below 10 and above 20 years teaching experience teachers and also based on their locality, and rural area category teachers perceived high than that of urban and tribal area category teachers.

Educational Implications

From this study it was noticed that, female category respondents perceived high than that of male category towards Factors Contributing for Affective Mathematics Teaching at Secondary Level.

Teaching experience is also one of the important variable to know the performance level, 10 to 20 years teaching experience category teachers perceived high than that of other groups. It shows that, experience of the teachers had influence on the students for the enhancement of students achievement. Once experience acquires the ability of the teacher performance and way of teaching is becoming effective. Hence, the major educational implication is that, the experience teachers are able in teaching mathematics effectively. Hence, it is suggested that, the administrators must observe that, the above areas which are selected for the study are more important in the teaching of mathematics.

From this study, it was noticed that, the rural area mathematics teachers perceived high than that of the urban area teachers towards the Factors Contributing for Affective Mathematics Teaching at Secondary Level. It shows that, all the areas

viz., Substantiality of Teaching, Quality of Teachers Presentations, Receptivity of the Students Ideas and Contribution, Use of Teaching Methods, Use of ICT (Information Communication Technology), Quality of Interaction with Students, Quality of Students Activities, Classroom Environment, Conduct and Return of Evaluation Material, Quality of Appraisal Report, Quality of Assignment enrichment Activities, Students Performance Appraisal, Performance of the Teacher, Professional Development of Teacher and Problems in the Teaching Mathematics are very important in the teaching of mathematics.

With regard to Substantiality of Teaching, it was found that this study was more than 95 percent of teachers teaching mathematics at secondary level perceived that, they know the subject very well on the specified lesson, they are also updating their subjects, they are concentrating their teaching adopting the Vision, Mission and Goals of the schools connecting the student knowledge, interest and experience to the lesson when teaching the subject areas, teachers are integrating values for practice in life situations when planning more than 95 percent of the teachers perceived that they are preparing Unit Plans and lesson plans and executing effectively in the classroom effectively for the benefit of learner. Majority of the respondents perceived that, they are benefiting through the resource training programmes organized by the department are helping the teachers. All the above factors are very important. Hence, the major implication is that, above factors are highly important areas are to be observed when teaching mathematics.

With regard to quality of teacher presentations, it was noticed that, more than 95 percent of the respondents voiced that, they are making the concepts clear when teaching mathematics, raising questions about the level of understanding on the concepts, observing the teaching suitability to level of learners. The teachers are guiding properly in the development of problem solving ability among students.

Through this study the following are the problem areas identified

- ✓ Teachers feeling difficult in the use of teaching learning materials in the teaching of mathematics.
- ✓ Lack of proper space for demonstration in the schools for explanation of mathematical concepts.
- ✓ Facing difficulties in covering of syllabus when using TLM
- ✓ Not having sufficient time and knowledge in the preparation plans etc., Lack of interest among students in learning mathematics.

Hence, the administrators must initiate plans and action for the betterment of the encouragement at classroom level and guide properly the mathematics teachers for the adopting of innovative practices at classroom level.

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