



A STUDY ON TEACHING EFFECTIVENESS OF MATHEMATICS TEACHERS

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Abstract:

Mathematics is one of the core subjects in secondary education different modern concepts and methods are introduced in the syllabus of mathematics at secondary stage. The curriculum revision is being undertaken by the state department of education (SCERT) and the central department of education (NCERT) constantly and all the modern mathematics is incorporated at the secondary stage. The teacher education programs for preparing mathematics teachers are also strength and during the past to ducats whenever the curriculum is changes different researching programs such as refresher courses, seminars, workshops etc., are conducted to make true teaching of mathematics more effective in secondary schools. Hence in this paper it is proposed to undertake teacher wise and student wise analysis for this study keeping in view of certain variables like gender, area of school, medium of teaching, board of school and teaching experience and a tool to measure teaching effectiveness of mathematics teachers and also to understand the type of relationship between the teaching effectiveness. The collected is analyzed by inferential statistics. The results revealed no significant differences in mean scores of teaching effectiveness of mathematics teachers towards gender, area of school, medium of teaching, board of school and teaching experience.

Key Words: Mathematics Teachers, Distribution, Teaching

Introduction:

Education plays a vital role in giving human being for proper equipment to lead precious and harmonious life. The education is a purposely and organized activity which is undertaken both by educator and learner for the sake of clear objective. Education has widely discussed and interpreted by different thinkers, philosophers and educationists with reference to its aims functions and implications. The present study is proposed to analyze the teaching Effectiveness of math's teachers in relation to gender, area of school, medium of teaching, board of school and teaching experience teacher ratio and syllabus. Hence the purpose of the present study is to develop a tool to measure teaching effectiveness of mathematics teachers and also to understand the type of relationship between the teaching effectiveness and its relation to student achievement.

Teaching Effectiveness:

In the dictionary of education BENGIMEN define teaching efficiency as the "Degree of success of a teacher in performing instructional and other duties specified in his position". The teaching effectiveness of secondary school mathematics is measured by obtaining rating from both head of the instructions on overall rating on the efficiency of the teacher selected at random on

- Knowledge in the subject matter
- Interest in teaching
- Preparation for teaching
- Discipline skill in class management
- Clarity in expression
- Expertise in teaching methods
- Moral values
- General knowledge and common sense
- Enthusiasm in doing things and getting things done by the student
- Honesty and sincerity in work

Statistical Analysis:

As it was mentioned already a questionnaire was administered on mathematics teachers to obtain the data and relevant information concerning teaching mathematics. The data where carefully analyzed by employing appropriate statistical techniques was used. To test the different hypothesis "t-test" and "F-ratio" where employed appropriately.

Statement of the Problem:

A Study on Teaching Effectiveness of Mathematics Teachers

Sample Design:

In this study, the sampling unit was the teachers of teaching mathematics in Vellore district. The total size of the sample was 210. The samples were collected using random sampling technique. Out of the 210 samples, 92 male and 118 female teachers of teaching mathematics taken as sample of study.

Objectives of the Study:

- To find out whether there is significant difference exists in the mean scores of teaching effectiveness of mathematics teachers towards gender.
- To find out whether there is significant difference exists in the mean scores of teaching effectiveness of mathematics teachers towards area of school.
- To find out whether there is significant difference exists in the mean scores of teaching effectiveness of mathematics teachers towards medium of teaching.
- To find out whether there is significant difference exists in the mean scores of teaching effectiveness of mathematics teachers towards area of board of school.
- To find out whether there is significant difference exists in the mean scores of teaching effectiveness of mathematics teachers towards teaching experience.

Hypotheses of the Study:

- There is no significant difference exists in the mean scores of teaching effectiveness of mathematics teachers towards gender.
- There is no significant difference exists in the mean scores of teaching effectiveness of mathematics teachers towards area of school.
- There is no significant difference exists in the mean scores of teaching effectiveness of mathematics teachers towards medium of teaching.
- There is no significant difference exists in the mean scores of teaching effectiveness of mathematics teachers towards area of board of school.
- There is no significant difference exists in the mean scores of teaching effectiveness of mathematics teachers towards teaching experience.

Tools Used For the Present Study:

- Teacher Effectiveness Scale by Umme Dixit (1993).

Description of the Tool and Scoring Procedure:

Preparation and planning for teaching classroom management, discipline, motivation, interaction, evaluation, knowledge of subject-matter its delivery and presentation including black board summary; teachers characteristics and interpersonal relations of teachers with others.

The scale is self-administrable. There is no time limit and there is no right or wrong responses. Hence the teachers are free to express their responses as they perceive, keeping in view the maximum possible effectiveness (high) of teachers and the least possible effectiveness (low) of teachers, as frame of references for individual rating. The scale had 60 statements. It is Likert type, scale range from poor, fair, good, very good and excellent. Score range from 1,2,3,4 and 5. Total score of the respondent ranges from 0 to 260.

Inferential Analysis:

Table 1: 't' test Between Mean Scores of Teaching Effectiveness of Mathematics Teachers Towards Gender

| Gender | N | Mean | SD | 't' Value | Level of Significance |
|--------|-----|--------|-------|-----------|-----------------------|
| Male | 92 | 145.36 | 46.11 | 1.002 | NS |
| Female | 118 | 152.05 | 49.32 | | |

It is evident from the table 1 the calculated 't' value is 1.002, which is not significant at 0.05 level. Hence, the framed null hypothesis is accepted and research hypothesis is rejected. It is inferred that there is no significant difference found out between male and female mean scores of teaching effectiveness of mathematics teachers.

Area of School and Teacher Effectiveness:

Table 2: 't' Test Between Mean Scores of Teaching Effectiveness of Mathematics Teachers Towards Area of School

| Area of School | N | Mean | SD | 't' Value | Level of Significance |
|----------------|-----|--------|-------|-----------|-----------------------|
| Rural | 103 | 148.72 | 47.32 | 0.117 | NS |
| Urban | 107 | 149.50 | 48.76 | | |

It is evident from the table 2 the calculated 't' value is 0.117, which is not significant at 0.05 level. Hence, the framed null hypothesis is accepted and research hypothesis is rejected. It is inferred that there is no significant difference found out between rural and urban mean scores of teaching effectiveness of mathematics teachers.

Medium of Teaching and Teacher Effectiveness:

Table 3: ‘t’ Test Between Mean Scores of Teaching Effectiveness of Mathematics Teachers Towards Medium of Teaching

| Medium of Teaching | N | Mean | SD | ‘t’ Value | Level of Significance |
|--------------------|-----|--------|-------|-----------|-----------------------|
| English | 103 | 148.72 | 47.32 | 0.465 | NS |
| Tamil | 107 | 149.50 | 48.76 | | |

It is evident from the table 3 the calculated ‘t’ value is 0.465, which is not significant at 0.05 level. Hence, the framed null hypothesis is accepted and research hypothesis is rejected. It is inferred that there is no significant difference found out between English and Tamil medium of mean scores of teaching effectiveness of mathematics teachers.

Board of school and Teacher Effectiveness:

Table 4: ‘F’ Test among the Sub- Samples of Board of School with Teaching Effectiveness of Mathematics Teachers Towards Medium of Teaching

| Type of School | Sum of Squares | Mean Squares | df | ‘F’ Value | Level of Significance |
|----------------|----------------|--------------|-----|-----------|-----------------------|
| Between Groups | 1390.371 | 695.185 | 2 | 0.300 | NS |
| Within Groups | 479134.410 | 2314.659 | 207 | | |
| Total | 480524.781 | | 209 | | |

It is evident from the table 4 the calculated ‘F’ value is 0.300, which is not significant at 0.05 level. Hence, the framed null hypothesis is accepted and research hypothesis is rejected. It is inferred that there is no significant difference among sub samples of board of school with mean scores of teaching effectiveness of mathematics teachers.

Teaching Experience and Teacher Effectiveness:

Table 5: ‘t’ Test Between Mean Scores of Teaching Effectiveness of Mathematics Teachers Towards Medium of Teaching

| Teaching Experience | N | Mean | SD | ‘t’ Value | Level of Significance |
|---------------------|-----|--------|-------|-----------|-----------------------|
| Less than 10 years | 99 | 144.86 | 47.84 | 1.216 | NS |
| Above 10 years | 111 | 152.91 | 47.93 | | |

It is evident from the table 5 the calculated ‘t’ value is 1.216, which is not significant at 0.05 level. Hence, the framed null hypothesis is accepted and research hypothesis is rejected. It is inferred that there is no significant difference found between less than 10 years and above 10 years of mean scores of teaching effectiveness of mathematics teachers.

Major Findings of the Study:

- It is inferred that there is no significant difference found out between male and female mean scores of teaching effectiveness of mathematics teachers.
- It is inferred that there is no significant difference found out between rural and urban mean scores of teaching effectiveness of mathematics teachers.
- It is inferred that there is no significant difference found out between English and Tamil medium of mean scores of teaching effectiveness of mathematics teachers.
- It is inferred that there is no significant difference among sub samples of board of school with mean scores of teaching effectiveness of mathematics teachers.
- It is inferred that there is no significant difference found between less than 10 years and above 10 years of mean scores of teaching effectiveness of mathematics teachers.

Recommendations for Future Studies:

In this study, mathematics teachers’ awareness of teacher effectiveness was assessed using a questionnaire, i.e., a self-report measure. Future studies could use alternative methods, both quantitative and qualitative. They could also measure the reality (level) of effective teaching practices and address the significance relationship between teaching effectiveness towards mathematics teaching. Finally, developing teaching models and strategies based on effective teaching would be valuable.

Conclusion:

The results also showed that there is no significant differences in mathematics teaching towards teaching effectiveness in the sample, which might be logical since new teachers in the transition to applied practice will have many questions about the most teaching effectiveness.. However, it may also be due to the lack of professional development programs for new teachers. As for the sample of teachers with ten or more years of experience, some need to be more motivated to develop their teaching effectiveness in line with modern trends and instead tend to use traditional teaching methods.

In contrast, teachers with 5-10 years of experience are more likely to know how to teach their students effectively. They may also be more motivated to develop their teaching methods because they know more about teaching practices, are aware of their students’ levels. There were no differences in the gender, area of school, medium of teaching, board of school and teaching experience which is most likely because the emerging interest

in teaching effectiveness in recent years has resulted in all teachers, regardless of experience, being subject to the same guidelines and training programs, which include presenting the latest trends.

References

1. Anastasi, A. (1982). Psychological Testing. New York: Macmillan Publishing Co. Inc.
2. Anderson, H.M. (1954). A Study of Criteria of Teaching Effectiveness. Journal of Experimental Education, 23 (1)
3. Guilford, J.P. (1965). Fundamental Statistics in Psychology and Education. New York: McGraw Hill Book Company
4. A. Dinesh Kumar, R. Sivaraman, Asymptotic Behavior of Limiting Ratios of Generalized Recurrence Relations, Journal of Algebraic Statistics, Vol 13, No. 2, 2022, 11-19
5. R. Sivaraman, J. Suganthi, A. Dinesh Kumar, P. N. Vijayakumar, R. Sengothai, On Solving an Amusing Puzzle, Specialusis Ugdymas, Special Education, Vol 1, No. 43, 2022, 643-647
6. A. Dinesh Kumar, R. Sivaraman, Analysis of Limiting Ratios of Special Sequences, Mathematics and Statistics, Vol 10, No. 4, 2022, 825-832
7. A. Dinesh Kumar, R. Sivaraman, On Some Properties of Fabulous Fraction Tree, Mathematics and Statistics, Vol 10, No. 3, 2022, 477-485
8. P. Senthil Kumar, R. Abirami, A. Dinesh Kumar, Fuzzy Model for the Effect of rhIL6 Infusion on Growth Hormone, International Conference on Advances in Applied Probability, Graph Theory and Fuzzy Mathematics, 2014, 246-252
9. C. Narayanan, A. Dinesh Kumar, S. Priyadharshini, S. Revathy, Cardiac Disorder Diagnosis Through Nadi (Pulse) Using Piezoelectric Sensors, International Journal of Multidisciplinary Research and Modern Education, Vol 1, No. 1, 2015, 209-214
10. P. Senthil Kumar, A. Dinesh Kumar, M. Vasuki, Stochastic Model to Find the Effect of Gallbladder Contraction Result Using Uniform Distribution, Arya Bhatta Journal of Mathematics and Informatics, Vol 6, No. 2, 2014, 323-328
11. M. Vasuki, A. Dinesh Kumar, R. Prabhakaran, A Study on GSM-Mobile Phone Network in Graph Theory, International Journal of Current Research and Modern Education, Vol 1, No. 1, 2016, 772-783
12. S. Rajivgandhi, A. Dinesh Kumar, R. Sundareswaran, V. Vineeth, Synthesis and Characterization of ZnO Nanoparticles, International Journal of Innovative Research in Technology, Science & Engineering, Vol 1, No. 5, 2015, 73-78
13. P. Senthil Kumar, K. Balasubramanian, A. Dinesh Kumar, Stochastic Model to Estimate the Insulin Secretion Using Normal Distribution, Arya Bhatta Journal of Mathematics and Informatics, Vol 7, No. 2, 2015, 277-282
14. A. Victor Richardson, A. Dinesh Kumar, S. Suthagar, E. Neduncheralathan, Thermal Performance Enhancement of Heat Pipe Using TiO₂ Nanofluid, International Journal of Multidisciplinary Research and Modern Education, Vol 1, No. 1, 2015, 64-75
15. P. Senthil Kumar, A. Dinesh Kumar, M. Vasuki, Stochastic Model to Find the Multidrug Resistance in Human Gallbladder Carcinoma Results Using Uniform Distribution, International Journal of Emerging Engineering Research and Technology, Vol 2, No. 4, 2014, 278-283
16. P. Senthil Kumar, A. Dinesh Kumar, M. Vasuki, Stochastic Model to find the Gallbladder Motility in Acromegaly Using Exponential Distribution, International Journal of Engineering Research and Applications, Vol 4, No. 8, 2014, 29-33
17. Nishant B. Narnaware, A. Dinesh Kumar, Educational Development and Evaluation: A Case Study from Nepal, Saudi Journal of Engineering and Technology, Vol 7, No. 9, 2022, 513-519
18. A. Dinesh Kumar, M. Vasuki, A Study on Challenges Faced in Palmyrah Cultivation With Special Reference to Perambalur District, Indo American Journal of Multidisciplinary Research and Review, Vol 7, No. 1, 2023, 81-84
19. M. Vasuki, A. Dinesh Kumar, Customers Preference and Satisfaction Towards Tamil Nadu Palm Products Development Board, International Journal of Multidisciplinary Research and Modern Education, Vol 9, No. 1, 2023, 142-149
20. K. Veerakumar, A. Dinesh Kumar, People Preference towards Organic Products, International Journal of Recent Research and Applied Studies, Vol 4, No. 7, 2017, 73-75
21. K. Veerakumar, A. Dinesh Kumar, Challenges of Agricultural Development, International Journal of Recent Research and Applied Studies, Vol 4, No. 5, 2017, 76-79
22. M. Suresh Kumar, A. Dinesh Kumar, Effect of Mental Training on Self Confidence among Professional College Students, International Journal of Recent Research and Applied Studies, Vol 4, No. 12, 2017, 51-53
23. M. Suresh Kumar, A. Dinesh Kumar, A Statistical Approach towards the Effect of Yoga on Total Cholesterol of Overweight Professional College Students, International Journal of Recent Research and Applied Studies, Vol 4, No. 2, 2017, 126-128

24. R. Sindhuja, A. Dinesh Kumar, A Study on the Level of Work-Life Balance among Medical Representatives, *International Journal of Recent Research and Applied Studies*, Vol 5, No. 12, 2018, 28-33
25. S. R. Boselin Prabhu, P. Rajeswari, A. Dinesh Kumar, An Analytical Review of Fiber-Optic Sensors and Biosensors, *Journal of Engineering, Scientific Research and Applications*, Volume 2, No. 1, 2016, 58-61
26. S. R. Boselin Prabhu, N. Balakumar, P. Rajeswari, A. Dinesh Kumar, Wireless Electricity Transfer Methodologies Using Embedded System Technology, *Journal of Engineering, Scientific Research and Applications*, Vol 2, No. 1, 2016, 81-89
27. S. R. Boselin Prabhu, P. Rajeswari, A. Dinesh Kumar, Analysis of Decentralized Clustering Hierarchy for Highly Distributed WSN, *Journal of Engineering, Scientific Research and Applications*, Vol 2, No. 2, 2016, 45-49
28. P. Senthil Kumar, A. Dinesh Kumar, M. Vasuki, Mathematical Model by Using Birth Death Processes to Estimate the Gallbladder Mean Emptying Curves, *International Journal of Applied Research*, Vol 1, No. 4, 2015, 34-37
29. P. Dhinakaran, S. Suthagar, E. Neduncheralathan, A. Dinesh Kumar, Investigation and Numerical Analysis as Cast Heat Treated Aluminium Alloy (Al-20% with MG) By Tensile Test, *International Journal of Applied Research*, Vol 1, No. 6, 2015, 114-117
30. P. Senthil Kumar, A. Dinesh Kumar, M. Vasuki, Stochastic Model for Finding the Gallbladder Ejection Fraction Results, *International Journal of Applied Research*, Vol 1, No. 2, 2015, 91-94
31. A. Dinesh Kumar, M. Vasuki, P. Pavithra, S. Srinithi, Estimate the Insulin Secretion Stimulated by GLP-1 Using Yule & CMJ Process, *International Journal of Mathematics and Computing*, Vol 1, No. 1, 2015, 1-4
32. P. Senthil Kumar, K. Balasubramanian, A. Dinesh Kumar, A New Stochastic Model to Estimate the Influence of Insulin on Circulating Ghrelin Using Gamma Distribution, *International Journal of Applied and Advanced Scientific Research*, Vol 1, No. 1, 2016, 4-8
33. M. Vasuki, A. Dinesh Kumar, Mohamed Usman Ali, Antony Raja, Bio Mathematical Model to Find the Gallbladder Contraction Outcomes Using Normal Distribution, *International Journal for Research in Applied Science & Engineering Technology*, Vol 4, No. 2, 2016, 233-236
34. A. Dinesh Kumar, M. Vasuki, Optimal Proportional Reinsurance with a Constant Rate of Interest, *International Journal of Computational Research and Development*, Vol 1, No. 1, 2016, 26-35
35. A. Dinesh Kumar, M. Vasuki, Estimate the Adrenocorticotrophic Hormone on Cortisol and DHEA'S Production through HJB Equations Using Stochastic Analysis, *International Journal of Computational Research and Development*, Vol 1, No. 1, 2016, 6-10
36. A. Dinesh Kumar, M. Vasuki, J. Malathi, A Study on Irredundance and Insensitive Arc in Fuzzy Graphs, *International Journal of Current Research and Modern Education*, Vol 1, No. 1, 2016, 736-747
37. A. Dinesh Kumar, M. Vasuki, A Study on Pythagorean Triples, *International Journal of Interdisciplinary Research in Arts and Humanities*, Vol 1, No. 1, 2016, 14-21
38. P. Senthil Kumar, K. Balasubramanian, A. Dinesh Kumar, Stochastic Model to Estimate the Changes in Plasma Insulin and FFAs During OLTT and OGTT Using Normal Distribution, *Bulletin of Mathematics and Statistics Research*, Vol 3, No. 3, 2015, 10-16
39. A. Dinesh Kumar, R. B. Ramyaa, S. Thilaga, N. Punitha, A New Mathematical Model to Estimate the Plasma Cortisol Concentration Using Gamma Distribution, *Adalya Journal*, Vol 7, No. 2, 2018, 55-59
40. P. Senthil Kumar, A. Dinesh Kumar, M. Vasuki, Stochastic Model to Find the Diagnostic Reliability of Gallbladder Ejection Fraction Using Normal Distribution, *International Journal of Computational Engineering Research*, Vol 4, No. 8, 2014, 36-41
41. M. Vasuki, P. Senthil Kumar, N. Rajesh, On Anti-Q-Fuzzy Deductive Systems of Hilbert Algebras, *International Journal of Analysis and Applications*, Vol 21, No. 42, 2023, 1-15
42. M. Vasuki, P. Senthil Kumar, Said Broumi, N. Rajesh, On Radical of Neutrosophic Primary Submodule, *International Journal of Neutrosophic Science*, Vol 22, No. 3, 2023 36-52
43. M. Vasuki, R. Sivaraman, Solving Quadratic Diophantine Equation for Integral Powers of 37, *International Journal of Mathematics and Computer Research*, Vol 12, No. 1, 2024, 3996-3998
44. A. C. Lal Kumar, A. Dinesh Kumar, M. Vasuki, A Study on Professional Competence of Mathematics Teachers in Higher Secondary Schools, *International Journal of Multidisciplinary Research and Modern Education*, Vol 10, No. 1, 2024, 40-44
45. A. C. Lal Kumar, A. Dinesh Kumar, M. Vasuki, A Study on Job Satisfaction of Mathematics Teachers in High Schools, *International Journal of Engineering Research and Modern Education*, Vol 9, No. 1, 2024, 15-20
46. A. Dinesh Kumar, R. Sivaraman, Ramanujan Summation for Pascal's Triangle, *Contemporary Mathematics*, Vol 5, No. 1, 2024, 817-825.