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Research Article

Multisensory Teaching Strategies In Enhancing Problem Solving Ability In Learning Mathematics

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ABSTRACT

Effective teaching involves in a student's motivated transmission of information, understanding, creativity and problem solving skills to creating positive classroom environments. The major objectives of the study is to find out whether the package use to enhancing problem solving ability in learning mathematics among higher secondary students is effective. The researcher adopted the Quasi-Experiment method has gathered information to measure a Multisensory Instruction definitely enhanced problem solving ability in learning mathematics of higher secondary students in mathematics. The researcher used stratified random sampling technique for selecting the sample from the population. The sample involves of 46 higher secondary students studying in secondary level in Dharmapuri District, Tamil Nadu. The researcher has constructed and standardized the following research tool (Achievement in Mathematics questionnaire) to collect data from the sample. The statistical used descriptive analysis, differential analysis. This researcher concluded, there is a significant difference in the post test scores of learning mathematics among higher secondary students with a control group and experimental group. This research outcome highlighted, Multisensory Instruction definitely enhanced learning mathematics among higher secondary students for an experimental group its effectiveness on the development of the adolescent students. Finally, using multisensory teaching can help stimulate students' minds and give them the ability to get better learning mathematics outcomes.

Keywords: Multisensory, learning mathematics, higher secondary students and effective.

INTRODUCTION

Life is nothing but a series of problems. Experience in dealing with problems will help the individual in cultivating strategies, which may prove to be of great value at crucial moments of life.
Teaching mathematics and learning mathematics to develop the abilities to solve a problem in mathematics and to find the solution to problems in daily life. In this modern technological world mathematics plays a vital role and has a peculiar stamp. Mathematics is essential for the progress of the modern world. There is a necessity to develop a positive attitude towards Mathematics from their childhood. Mathematical knowledge is related to intelligence, reasoning ability, mathematical ability and problem-solving ability.
Man faces many problems in course of living. He needs to have some willed to live, desires to possess some, to achieve some, and to continue to do certain things up to his satisfaction. But all his attempts may not be successful due to obstacles and interferences. These need a serious attention to overcome them. He may have to think and reason to proceed systematically.
In the present day to feel more and more practical value of mathematics in our life. Mathematics helps student interest of highly disciplined mode of thinking, computational skills, structure relationship, regularity and systematic variation knowledge of skills. Multisensory teaching helps students understand concepts, methods of reasoning and effective ways of presenting their ideas to learning to use of discovery method is the most important future of modern mathematics.

STATEMENT OF THE PROBLEM

Students are frequently troubled with their problems because they do not have the capacity and training to solve problems. Citizens of tomorrow must be effectively altered to control emotions and ways of adjusting to situations in the society. As a consequence of this, they may aware of anxious conditions and becomes emotionally balanced and problem solving in their behaviour favouring good fame for them in the society. Hence the researcher studied this study. The present study is entitled as multisensory teaching strategies in enhancing problem solving ability in mathematics. The researcher carries out this study to the encouraging goals in learning mathematics on the achievement of higher secondary students who use a Multisensory teaching to problem solving ability in learning mathematics.

OBJECTIVES OF THE STUDY

- To find out if there is a significant difference in the pre-test scores of problem solving ability in learning mathematics among higher secondary students for control group with respect to demographic variables.
- To find out if there is a significant difference in the post test scores of problem solving ability in learning mathematics among higher secondary students through traditional method for control group with respect to demographic variables.
- To find out if there is a significant difference in the pre scores of problem solving ability in learning mathematics among higher secondary students for experimental group with respect to demographic variables.
- To find out if there is a significant difference in the post test scores of problem solving ability in learning mathematics among higher secondary students through administration of Multisensory teaching strategies for experimental group with respect to demographic variables.
- To find out if there is a significant difference in the post test scores of problem solving ability in learning mathematics among higher secondary students between control and experimental group.
- To find whether the package use to enhancing problem solving ability in learning mathematics among higher secondary students is effective.

The demographic variables are gender, locality of students, Are you going tuition for Mathematics and Learning through internet.

HYPOTHESES OF THE STUDY

- There may be significant differences in the pre test scores of problem solving ability in learning mathematics among higher secondary students for control group with regard to demographic variables.
- There may be significant differences in the post test scores of problem solving ability in learning mathematics among higher secondary students through traditional method for control group with regard to demographic variables.
- There may be significant differences in the pre test scores of problem solving ability in learning mathematics among higher secondary students for experimental group with regard to demographic variables.
- There may be significant differences in the post test scores of problem solving ability in learning mathematics among higher secondary students through administration of Multisensory teaching strategies for experimental group with regard to demographic variables.
- There may be significant differences in the post test scores of problem solving ability in learning mathematics among higher secondary students between control and experimental group.
- The package used to enhancing problem solving ability in learning mathematics among higher secondary students may be effective.

The demographic variables are gender, locality of students, Are you going tuition for Mathematics and Learning through internet.

METHODOLOGY OF THE STUDY

The advantage of the investigators adopted the Quasi-Experimental method has gathered information to much a Impact of Multisensory teaching strategies in enhancing problem solving ability in Learning Mathematics among Higher Secondary Students. The researcher used a stratified random sampling technique to select the sample from the population. The sample incorporates 46 higher secondary students studying in schools of Dharmapuri District in Tamil Nadu. As per the expert's views, feedback and suggestionsthe researcher has constructed and standardized the following research tool (mathematics achievement questionnaire) were modified and made ready to collect data from the sample. The data was tabulated then the way analyzed statistically using descriptive analysis and differential analysis.

TESTING OF HYPOTHESES

Hypothesis: 1

There may be significant differences in the pre-test scores of problem solving ability in learning mathematics among higher secondary students for control group with respect to demographic variables.

Significance Difference in the problem solving ability in learning mathematics among higher secondary students with respect to demographic variables in the pre test of control group students

Demographic Variables		N	Mean	Std. Deviation	t value	P value
Gender	Male	14	6.93	1.439	0.267	0.79 (NS)
	Female	9	7.11	1.691		
Locality of Students	Urban	11	8.09	1.221	4.549	0.01 (S)
	Rural	12	6.00	0.953		
Learning through Internet	Yes	12	8.00	1.206	4.650	0.01 (S)
	No	11	5.91	0.944		
Are you going tuition for Mathematics	Yes	13	7.69	1.494	3.062	0.01 (S)
	No	10	6.10	0.944		

NS – Not Significant at 5% level, S – Significant at 5% level

Inference:

From the above table that p values are greater than 0.05, so the alternative hypothesis rejected at 5% level of significance in the gender. Hence it is concluded that there is no significant difference exists in gender of higher secondary students.

From the above table, since p values are less than 0.05, so the null hypothesis accepted at 5% level of significance in the Locality of Students, learning through Internet and tuition for Mathematics. Hence it is concluded that there is significant difference in Locality of Students, learning through Internet and tuition for Mathematics of higher secondary students.

Hypothesis: 2

There may be significant differences in the post test scores of problem solving ability in learning mathematics among higher secondary students through traditional method for control group with respect to demographic variables.

Significance Difference in the problem solving ability in learning mathematics among higher secondary students through traditional method with respect to demographic variables in the post test of control group students

Demographic Variables		N	Mean	Std. Deviation	t value	P value
Gender	Male	14	23.43	1.989	0.643	0.53 (NS)
	Female	9	24.11	2.759		
Locality of Students	Urban	11	25.45	1.440	5.281	0.01 (S)
	Rural	12	22.08	1.621		
Learning through Internet	Yes	12	25.33	1.435	5.427	0.01 (S)
	No	11	21.91	1.578		
Are you going tuition for Mathematics	Yes	13	24.69	2.287	2.841	0.01 (S)
	No	10	22.40	1.578		

NS – Not Significant at 5% level, S – Significant at 5% level

Inference:

From the above table show that p values are greater than 0.05, so the alternative hypothesis rejected at 5% level of significance in the gender. Hence it is concluded that there is no significant difference exists in gender of higher secondary students.

From the above table show that p values are less than 0.05, so the alternative hypothesis accepted at 5% level of significance in the Locality of Students, learning through Internet and tuition for Mathematics. Hence it is concluded that there is significant difference in Locality of Students, learning through Internet and tuition for Mathematics of higher secondary students.

Hypothesis: 3

There may be significant differences in the pre-test scores of problem solving ability in learning mathematics among higher secondary students for experimental group with respect to demographic variables.

Significance Difference in the problem solving ability in learning mathematics among higher secondary students with respect to demographic variables in the post test of experimental group students

Demographic Variables		N	Mean	Std. Deviation	t value	P value
Gender	Male	14	6.71	1.383	1.033	0.32 (NS)
	Female	9	7.33	1.414		
Locality of Students	Rural	11	5.91	0.701	5.056	0.01 (S)
	Urban	12	7.92	1.165		
Learning through Internet	Yes	10	8.30	0.675	7.926	0.01 (S)
	No	13	5.92	0.760		
Are you going tuition for Mathematics	Yes	13	7.62	1.325	3.133	0.01 (S)
	No	10	6.10	0.994		

NS – Not Significant at 5% level, S – Significant at 5% level

Inference:

From the above table show that p values are greater than 0.05, so the alternative hypothesis rejected at 5% level of significance in the gender. Hence it is concluded that there is no significant difference exists in gender of higher secondary students.

From the above table show that values are less than 0.05, so the alternative hypothesis accepted at 5% level of significance in the Locality of Students, learning through Internet and tuition for Mathematics. Hence it is concluded that there is significant difference in Locality of Students, learning through Internet and tuition for Mathematics of higher secondary students.

Hypothesis: 4

There may be significant differences in the post test scores of problem solving ability in learning mathematics among higher secondary students through administration of Multisensory teaching strategies for experimental group with respect to demographic variables.

Significance Difference in the problem solving ability in learning mathematics among higher secondary students through administration of multi-sensory teaching strategies with respect to demographic variables in the post test of experimental group students

Demographic Variables		N	Mean	Std. Deviation	t value	P value
Gender	Male	14	26.93	1.859	0.209	0.84 (NS)
	Female	9	27.11	2.147		
Locality of Students	Rural	11	25.36	1.027	6.852	0.01 (S)
	Urban	12	28.50	1.168		
Learning through Internet	Yes	10	28.80	1.033	7.063	0.01 (S)
	No	13	25.62	1.121		
Are you going tuition for Mathematics	Yes	13	28.38	1.193	7.232	0.01 (S)
	No	10	25.20	0.919		

NS – Not Significant at 5% level, S – Significant at 5% level

Inference:

From the above table show that p values are greater than 0.05, so the null hypothesis accepted at 5% level of significance in the gender. Hence it is concluded that there is no significant difference exists in gender of higher secondary students.

From the above table show that p values are less than 0.05, so the null hypothesis rejected at 5% level of significance in the Locality of Students, learning through Internet and tuition for Mathematics. Hence it is concluded that there is significant difference in Locality of Students, learning through Internet and tuition for Mathematics of higher secondary students.

Hypothesis: 5

There may be significant differences in the post test scores of problem solving ability in learning mathematics among higher secondary students between control and experimental group.

Table No: 3 Significance of Difference between control group and experimental group post-test of problem solving ability in learning mathematics among higher secondary students

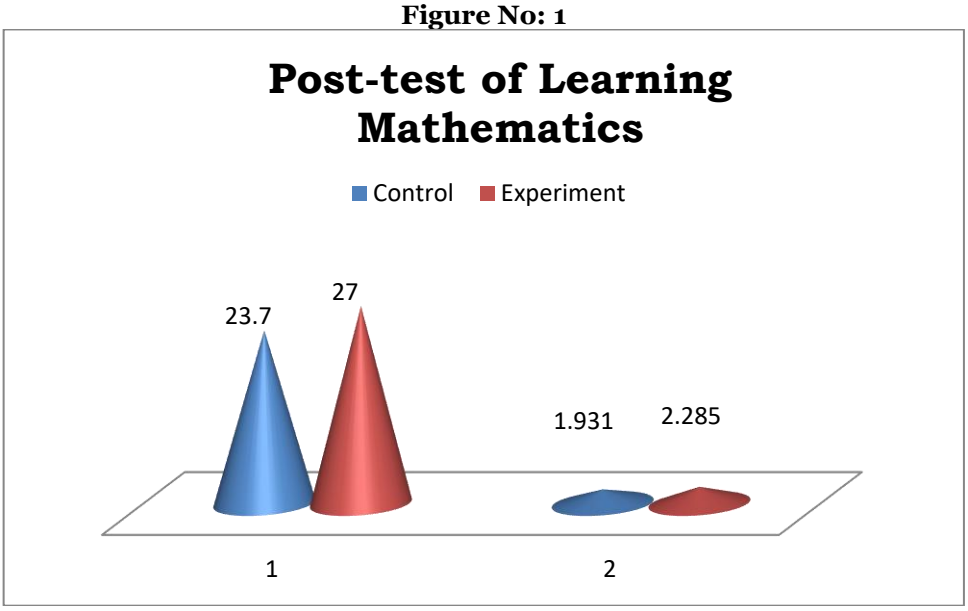
Post Test	N	Mean	Std. Deviation	r value	t value	P value
Control	23	23.70	1.931	0.155	4.935	0.01 (S)
Experiment	23	27.00	2.285			

S – Significant at 5% level

Inference:

From the above table show that p values are 0.01 is lesser than the table value at 0.05 so the null hypothesis rejected at 5% level of significance. Hence, there is significant difference in the post test scores of problem solving ability in learning mathematics among higher secondary students through administration of Multisensory teaching strategies between control group and experimental group.

Figure No: 1



RESULTS AND DISCUSSION

The data analysis result reveals that the Multisensory teaching strategies has significant effect in learning selected mathematical concepts among higher secondary students.

The researcher believe that the difference in the control group pre test mean score of urban students [8.09] have better knowledge than rural students [6.00]. The result showed that the mean score of learning through Internet said yes [8.00] have enhanced learning through Internet than said no [5.91]. The result showed that the mean score of tuition for Mathematics said yes [7.69] have enriched tuition for Mathematics than said no [6.10].

The researcher believe that the difference in the control group post test mean score of urban students [25.45] have better knowledge than rural students [22.08]. The result showed that the mean score of learning through Internet said yes [25.33] have improved learning through Internet than said no [21.91]. The result showed that the mean score of tuition for Mathematics said yes [24.69] have enriched tuition for Mathematics than said no [22.40].

The researcher believe that the difference in the experimental group pre test mean score of urban students [7.92] have better knowledge than rural students [5.91]. The result showed that the mean score of learning through Internet said yes [8.30] have enriched learning through Internet than said no [5.92]. The result showed that the mean score of tuition for Mathematics said yes [7.62] have enhanced tuition for Mathematics than said no [6.10].

The researcher believe that the difference in the experimental group post test mean score of urban students [28.50] have better knowledge than rural students [25.36]. The result showed that the mean score of learning through Internet said yes [28.80] have enhanced learning through Internet than said no [25.62]. The result showed that the mean score of tuition for Mathematics said yes [28.38] have improved tuition for Mathematics than said no [25.20].

The result showed that the mean and standard Deviation values of Post-test scores in the experimental group 27.00 and 2.285 have improved than control group 23.70 and 1.931 respectively. Hence concluded used a Multisensory Instruction approach to learning mathematics enriched for experimental method among higher secondary students.

CONCLUSION

Effective teaching involves in a student's motivated transmission of information, understanding, creativity and problem solving skills to creating positive classroom environments. This researcher concluded, there is a significant difference in the post test scores of problem solving ability in learning mathematics among higher secondary students with a control group and experimental group. This research outcome highlighted, Multisensory teaching strategies definitely enhanced problem solving ability in learning mathematics among higher secondary students for an experimental group its effectiveness on the development of the adolescent students. The retention of students' involvement in the problem-solving task and Multisensory teaching strategies helps knowledge and motivates interest can be applied to other mathematical materials to improve this technology. Finally, using multisensory teaching can help stimulate students' minds and give them the ability to get better learning mathematics outcomes.

REFERENCES

1. Jadhav, A. K., & Gathoo, V. S. (2018).Effect of Abacus Training on Numerical Ability of Students with Hearing Loss. Disability, CBR & Inclusive Development,29(2), 59-75.
2. Jubran, S. (2012).Using Multi Sensory Approach for Teaching English Skills and Its Effect on Students 'achievement at Jordanian Schools. European Scientific Journal, 8, 22. ISSN: 1857 – 7881 (Print) e - ISSN 1857- 7431.
3. Magulod, G. C. (2017). Evaluation of multisensory instructional material package for elementary learners. Asia Pacific Journal of Multidisciplinary Research, 5(4), 83-93.
4. Mevarech, A.R and Rich,Y.(!985). Effects of Computer Assisted Mathematics Instruction on Disadvantaged Pupils' cognitive and Affective Development. Journal of Educational Research. 79 (1), 5-11.
5. Obaid, M. A. S. (2013). The impact of using multi-sensory approach for teaching students with learning disabilities. Journal of International Education Research (JIER),9(1), 75-82.
6. Panda, B.N. (1997). Teacher Education, New Delhi: APH Publishing Corporation.
7. Perera, Nirukshi (2018). E-learning in mathematics, Journal of Multilingual and Multicultural Development, Routledge. 36(3), 297-312.
8. Sedlmeier, Peter, (2018). E-learning concepts in mathematics, Journal of Psycholinguistic Research, Apr 2016. 45(2), 317-336.
9. Yu, K., Tang, H., Gong, R., Dong, J., & Hu, S. (2018). Effects of the Application of Multimedia to Library Use Education on Learning Motivation and Learning Satisfaction. Eurasia Journal of Mathematics, Science and Technology Education, 14(7), 2987-2994.