

IMPACT OF MULTIMEDIA INTEGRATED MULTISENSORY INSTRUCTION ON LEARNING MATHEMATICS AMONG HIGHER SECONDARY STUDENTS

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Abstract

The main objectives of the study is to find out whether the package use to enhancing learning mathematics among higher secondary students is effective. The researcher adopted the Quasi-Experiment method has gathered information to measure a Multimedia Integrated Multisensory Instruction definitely enhanced learning mathematics of higher secondary students in mathematics. The investigator used simple random sampling technique for selecting the sample from the population. The sample consists 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, Multimedia Integrated 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: Multimedia Integrated Multisensory, learning mathematics, higher secondary students and effective

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INTRODUCTION

Mathematics is subject has extensive application in our day-to-day life calculates wages, expenses and balances are making use a lot of simple mathematics. Aims of education the individual way that becomes contributory of students understand knowledge, skills development of attitude and their ideas. 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.

REVIEW OF RELATED STUDIES

Yu, K., Tang, H., Gong, R., Dong, J., & Hu, S. (2018). Evaluated this study on the effects of the Application of Multimedia to Library Use Education on Learning Motivation and Learning Satisfaction. The research results show most correlations between the library use education and learning motivation, library use education and learning satisfaction, and learning motivation and learning satisfaction and expecting to enhance students' library resource use frequency to promote learning motivation and satisfaction.

Jadhav, A. K., & Gathoo, V. S. (2018). The study focussed on the effect of Abacus training on numerical ability (comprising of counting and mathematical operations) of children with hearing loss. The findings revealed that the experimental group which was instructed through Abacus showed higher proficiency in numerical ability as compared to the control group instructed through the conventional method. Gender as a variable seems to influence the mean achievement of numerical ability of students with hearing loss. While girls and boys did not differ in simple tasks such as counting, boys were found to be better in mathematical operations and overall numerical ability.

Magulod, G. C. (2017) evaluated the acceptability, usefulness and appropriateness of multisensory instructional material package for elementary learners. The study employed design and development research method is evaluating the learning materials, the descriptive-comparative method was engaged. Findings exposed that the multisensory instructional materials were acceptable, useful and correct to be utilized in the elementary classroom. Test of difference showed that teacher evaluators perceived higher evaluation on the usefulness of the materials than the student teacher respondents.

Obaid, (2013) investigated the study on effect of using the Multi-Sensory Approach for teaching students with learning disabilities on the sixth grade students' achievement in mathematics at Jordanian public schools. The results of the study point out that there is a significant difference in the post- test between the control and the experimental groups in support of the experimental group. The Multi-Sensory move towards teaching mathematics to sixth graders is evidence for a significant level of mathematical achievement gained.

Jubran, S. (2012). Investigate the effect of using Multi Sensory Approach for teaching English language skills on the tenth grade students' achievement in English at Jordanian public schools. The findings of the study indicated that there were statistically significant differences in the post- test between the control and the experimental groups in favor of the experimental group. The researcher concluded that students were more engaged in learning when they were given a chance to use all their senses and using multi sensory approach is a powerful tool with which students can learn English language with entertainment.

STATEMENT OF THE PROBLEM

The starting step of research process is identifying research problem. Students need to ideas of using methods for meaningful learning to a concrete level of understanding mathematics. The use of mathematics is one method to help student's achievement in their life. Students will be active participants of their own learning and create the formation of ideas. Multisensory Instruction used to teach different modalities at the same time, reaching a larger percentage of students learning. The investigator carries out this study to the positive goals in learning mathematics on the achievement of higher secondary students who use a Multimedia Integrated Multisensory Instruction approach to learning mathematics.

OBJECTIVES OF THE STUDY

- To find out the significant differences in the pre test scores of learning mathematics among higher secondary students for control group with respect to demographic variables.
- To find out the significant differences in the post test scores of learning mathematics among higher secondary students through traditional method for control group with respect to demographic variables.
- To find out the significant differences in the pre scores of learning mathematics among higher secondary students for experimental group with respect to demographic variables.
- To find out the significant differences in the post test scores of learning mathematics among higher secondary students through administration of Multimedia Integrated

Multisensory Instruction for experimental group with respect to demographic variables.

- To find out the significant differences in the post test scores of learning mathematics among higher secondary students between control and experimental group.
- To find whether the package use to enhancing 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 learning mathematics among higher secondary students for control group with respect to demographic variables.
- There may be significant differences in the post test scores of learning mathematics among higher secondary students through traditional method for control group with respect to demographic variables.
- There may be significant differences in the pre test scores of learning mathematics among higher secondary students for experimental group with respect to demographic variables.
- There may be significant differences in the post test scores of learning mathematics among higher secondary students through administration of Multimedia Integrated Multisensory Instruction for experimental group with respect to demographic variables.
- There may be significant differences in the post test scores of learning mathematics among higher secondary students between control and experimental group.
- The package used to enhancing 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 Multimedia Integrated Multisensory Instruction on Learning Mathematics among Higher Secondary Students. The investigator used a simple random sampling technique for selecting the sample from the population. The sample

consists of 46 higher secondary students studying in schools of Dharmapuri District in Tamil Nadu. The researcher has constructed and standardized the following research tool (mathematics achievement questionnaire) 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 learning mathematics among higher secondary students for control group with respect to demographic variables.

Significance Difference in the achievement on 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	Rural	10	6.10	0.994	3.062	0.01 (S)
	Urban	13	7.69	1.494		
Learning through Internet	Yes	11	8.09	1.221	4.549	0.01 (S)
	No	12	6.00	0.953		
Are you going tuition for Mathematics	Yes	12	8.00	1.206	4.650	0.01 (S)
	No	11	5.91	0.944		

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

Inference:

From the above table 1, since 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, since 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: 2

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

Significance Difference in the achievement on 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	Rural	10	22.40	1.578	2.841	0.01 (S)
	Urban	13	24.69	2.287		
Learning through Internet	Yes	11	25.45	1.440	5.281	0.01 (S)
	No	12	22.08	1.621		
Are you going tuition for Mathematics	Yes	12	25.33	1.435	5.427	0.01 (S)
	No	11	21.91	1.578		

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

Inference:

From the above table 2, since 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, since 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: 3

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

Significance Difference in the achievement on 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 1, since 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, since 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: 4

There may be significant differences in the post test scores of learning mathematics among higher secondary students through administration of Multimedia Integrated Multisensory Instruction for experimental group with respect to demographic variables.

Significance Difference in the achievement on learning mathematics among higher secondary students through administration of Multimedia integrated multi-sensory Instruction 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 1, since 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, since 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 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 learning mathematics among higher secondary students

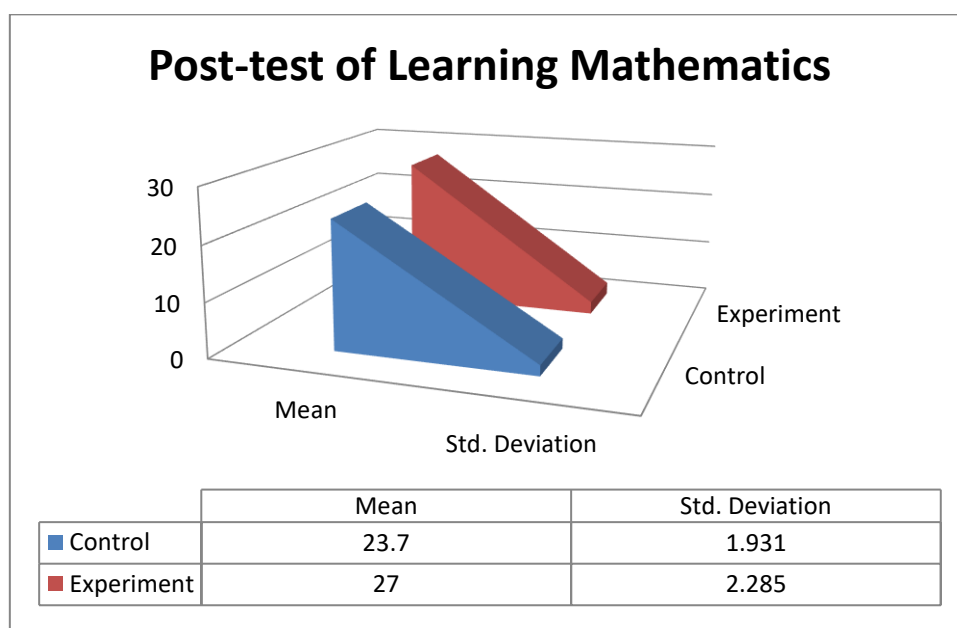
Post Test	N	Mean	Std. Deviation	r value	t value	P value
Control	23	23.70	1.931	0.155	4.935	0.01 (S)
Experiment	23	27.00	2.285			

S – Significant at 5% level

Inference:

From the above table 5, since 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 learning mathematics among higher secondary students through administration of Multimedia Integrated Multisensory Instruction between control group and experimental group.

Figure No: 1



RESULTS AND DISCUSSION

The data analysis result reveals that the Multimedia Integrated Multisensory Instruction 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 [7.69] have better knowledge than rural students [6.10]. The result showed that the mean score of learning through Internet said yes [8.09] have enhanced learning through Internet than said no [6.00]. The result showed that the mean score of tuition for Mathematics said yes [8.00] have enriched tuition for Mathematics than said no [5.91].

The researcher believe that the difference in the control group post test mean score of urban students [24.69] have better knowledge than rural students [22.40]. The result showed that the mean score of learning through Internet said yes [24.45] have improved learning through Internet than said no [22.08]. The result showed that the mean score of tuition for Mathematics said yes [25.33] have enriched tuition for Mathematics than said no [21.91].

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 Multimedia Integrated 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 learning mathematics among higher secondary students with a control group and experimental group. This research outcome highlighted, Multimedia Integrated Multisensory Instruction definitely enhanced 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 multi-media Integrated Multisensory Instruction 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.

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