

An Analytical Outcome Of "Model Teaching Program (Mtp)" To Achieve Practical and Visual Development of Mathematics Among Students in Secondary Education

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Abstract

Model Teaching Program have been introduced to achieve Practical and Visual Development of Mathematics. This paper considers an analytical outcome of Modal Teaching Program (MTP). The researcher used the questionnaire, academic achievement encouragement scale and visual models of mathematics to collect the data (Prepared by the Researcher). Utilizing a study technique based on a semi experimental approach and the statistical programme SPSS, the collected data were analysed. The questionnaire was prepared by the researcher according to CBSE and RBSE curriculum and mathematics books. The results show that there are statistically significant differences between the pre and post MTP scores for Practical and Visual Development of Mathematics. It is also indicating that the programme will aid secondary students in improving their mathematical creativity and academic achievement encouragement.

Keywords: Model Teaching Program (MTP), Visual Learning, Visual Development, Practical Development, Secondary Education

Introduction

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Visual learning is defined as assimilation of information from visual formats. When do students best understand information in class? They see that visual information is presented in a variety of formats, such as pictures, flowcharts, diagrams, videos, simulations, illustrations, cartoons, coloring books, slide shows/power point decks, posters, movies, games and flash cards (Rodger et al. 2009)¹ Various studies report that 75 of all information processed by the brain is derived from visual formats. Furthermore, visual information is mapped better in students' minds (Williams, 2009)².

The model learning program helps students to develop visual thinking, which is a learning style by which the learner is able to better understand and retain information by connecting ideas, words, and concepts.

Through modelling, a learner might have a clear idea of how to approach the issue at hand. A student will feel more confident about how to finish the project if they can visualise it. This kind of direction sets the pupils up for success by demonstrating what the teacher expects. Nothing is more annoying for a teacher or a student than when instructions have been given but the students still do not understand how or where to start. These difficulties will vanish with modelling, which will improve classroom management.

Research has highlighted the importance of Model Teaching Program both for teachers and students in their teaching and learning of mathematics. The use of visual representations in general is an important part of teachers' knowledge of mathematics and they can play an important role in the explanation of mathematical ideas.

The analysis of narrative (qualitative) data is conducted by organizing the data into common themes or categories. It is often more difficult to interpret narrative data since it lacks the built-in structure found in numerical data. Initially, the narrative data appears to be a collection of random, unconnected statements. The assessment purpose and questions can help direct the focus of the data organization (Dillaway 2017)³.

Research Problem

What is the effectiveness of Model Teaching Program (MTP) of mathematics among students in secondary education?

Was the key topic the researcher sought to address?

The sub-questions:

1) What are the elements of the suggested Model Teaching Program?

2) Does the programme "MTP" evolve?

3) Did the MTP boost academic achievement?

The Relevance

The following can benefit from the research: 1) Faculty members: Identifying the aspects of academic accomplishment encouragement, creativity in mathematics, and MTP skills 2) Students: By utilizing Model Teaching Program, practical and visual development of mathematics boosts their involvement in the classroom, and encouraging academic accom plishment and creativity in mathematics.

Methodology

The Research Approach

To analyze and interpret data and statistics, visual model approach (a group experimental design), analytical descriptive method of references and questionnaire, and SPSS were all used.

The questionnaire, academic achievement encouragement scale and visual models of mathematics to collect the data was used. It was taught utilising the study programme to 22 secondary school students from sixth to tenth grade in different schools of Udaipur.



Figure 1: SSV Approach

• Selection of Fields: This section identifies the desired field by which visual model can be made.

- Selection of Tools: This section helps us to choose Handmade or Designed Models.
- Verification: This section approves the working of Visual Models by proved methods.

Results and Discussion

After having discussed the Review of Literature & research Methodology, this shall

Section I: Class 6th

Discuss analysis of primary data collected through structured questionnaire from 250 respondents. The analysis of the data via statistical measures and/or narrative themes should provide answers to the assessment questions. Interpreting the analysed data from the appropriate perspective allows for determination of the significance and implications of the assessment.

		Class wise responses			
		Before MTP	After MTP		
		Correct answer given around	Correct answer given around 50		Increasing
Sr. No.	Questions	50 students per class	students per class	Difference	Doto
	Questions	6th	6th	6th	Nate
1	Q1	26	38	12	46.15%
2	Q2	31	39	8	25.80%
3	Q3	15	26	11	73.33%
4	Q4	10	21	11	110%
5	Q5	16	26	10	62.5%
6	Q6	16	29	13	81.25%
7	Q7	20	31	11	55%
8	Q8	19	26	7	36.84%
9	Q9	28	33	5	17.85%
10	Q10	17	24	7	41.17%
TOTAL		198	293		

Chart: 1: Clas 6th Result



From the results obtained, it can be concluded that in today's modern era, mathematics which is a very dilemma for the students, many students consider it very difficult and run away from it. Mathematical problems should be solved by using new technology so that it is understandable to every student. MTP technique can become a good solution for visualizing Mathematics subject.

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Table 2: Class 7 th Result				
	Class wise responses			
		Before MTP	After MTP	
Sr. No.	Questions	Correct answer given	Correct answer given	
		around 50 students per class	around 50 students per class	Increasing
		7th	7th	Rate
1	Q1	33	41	24.24%
2	Q2	24	35	45.83%
3	Q3	26	31	19.23%
4	Q4	24	37	54.16%
5	Q5	21	30	42.85%
6	Q6	27	35	29.62%
7	Q7	26	34	30.76%
8	Q8	16	29	81.25%
9	Q9	19	36	89.47%
10	Q10	21	27	28.57%
TOTAL		237	335	







Q1

Q2

Q3

100.00% 90.00% 80.00% 70.00% 60.00% 50.00% 40.00% 20.00% 10.00% 0.00%

to be a panacea for maths related problems of students of any level.

Q10

Section III: Class 8th

Table 3: Clas 8th Result

Q5

Increasing Rate

Q4

Q6

Q7

Q8

Q9

		Class wise responses			
		Before MTP	After MTP		
Sr. No.	Questions	Correct answer given	Correct answer given		
		around 50 students per class	around 50 students per class	Increasing Rate	
		8th	8th		
1	Q1	33	45	36.36%	
2	Q2	31	42	35.48%	
3	Q3	29	36	24.13%	
4	Q4	28	35	25%	
5	Q5	26	30	15.38%	
6	Q6	21	28	33.33%	
7	Q7	19	33	73.68%	
8	Q8	20	31	55%	
9	Q9	18	38	111.11%	
10	Q10	19	31	63.15%	
TOTAL		244	349		



From the results obtained, it can be concluded that the questions at each level, whether easy

or difficult, can be made easy for the students by using MTP technique.

Section IV: Class 9th

Table 4: Clas 9th Result

	Class wise responses			
		Before MTP	After MTP	
Sr. No.	Questions	Correct answer given around	Correct answer given	
		50 students per class	around 50 students per class	Increasing Data
		9th	9th	Increasing Kate
1	Q1	39	47	20.51%
2	Q2	30	39	30%
3	Q3	31	36	16.12%
4	Q4	24	39	62.5%
5	Q5	26	39	50%
6	Q6	29	35	20.68%
7	Q7	21	33	57.14%
8	Q8	13	31	138.46%
9	Q9	19	30	57.89%
10	Q10	21	39	85.71%
TOTAL		253	368	

Chart 4: Clas 9th Result



From the results it can be concluded that MTP technique is beneficial for the students at every level. Section V: Class 10th

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Table 5: Clas 10 th Result					
	Class wise responses				
		Before MTP	After MTP		
Sr. No.	Questions	Correct answer given	Correct answer given		
		around 50 students per class	around 50 students per class	Increasing Data	
		10 th	10th	mereasing Kate	
1	Q1	42	47	11.90%	
2	Q2	37	46	24.32%	
3	Q3	30	40	33.33%	
4	Q4	24	39	62.5%	
5	Q5	22	35	59.09%	
6	Q6	26	41	57.69%	
7	Q7	31	45	45.16%	
8	Q8	27	38	40.74%	
9	Q9	29	41	41.37%	
10	Q10	10	24	140%	
TOTAL		278	396		

Chart 5: Clas 10th Result



From the results obtained, it can be concluded that MTP technique is proving helpful in facilitating the problems of mathematics at every level of the students, so in conclusion it can be said that this technique develops the mental space of the students.

Section VI: Combined Results Of All Classes

Lable V. Combined Results	Table	6:	Combined	Results
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Sr.			
No.	Class	Before MTP	After MTP
1.	class 6	198	293
2.	class 7	237	335
3.	class 8	244	349
4.	class 9	253	368
5.	class 10	287	396

Chart 6: Combined Results



From the results obtained, it can be concluded that MTP technique is proving helpful in facilitating the problems of mathematics at every class level. So, in conclusion it can be said that this technique develops the mental space of the students.

Table	7:	Pupil's	satisfaction	in	Model
Teachi	ng l	Program			

t-Test: Paired Two Sample for Means			
	YES	NO	
Mean	16.2	3.8	
Variance	242.2	3.7	
Observations	5	5	

Pearson Correlation	0.076832
Hypothesized Mean Difference	0
df	4
t Stat	1.784958
P(T<=t) one-tail	0.074411
t Critical one-tail	2.131847
P(T<=t) two-tail	0.148822
t Critical two-tail	2.776445

When respondents were asked that pupil's satisfaction in Model Teaching Program is indifferent with respect to their demographics. Result was received that t Stat value (1.784958) is lower than t-Critical two-tail value (2.776445), it clearly indicates that acceptance of hypothesis that there is pupil's satisfaction in Model Teaching Program is indifferent with respect to their demographics.

Conclusion

This paper discusses an analytical outcome of MTP and new visual learning strategy and its impact on the development of student's highorder thinking skills, corresponding to analytical thinking. Learning mathematics is basically a constructive process that extends beyond the learning styles, learning concepts, procedures and their applications.

Mathematics is more than vast collection of fixed concepts and skills that helps the students to attain higher intellectual and mathematical abilities like logical thinking, rational reasoning, attending to the essential aspects of the sum, orderly presentation, precision, accuracy, analytical and inductive skills, numerical abilities, problem solving abilities and spatial abilities.

As per the results of the present study, another noticeable finding is that:

- MTP revolutionise the ability of learning mathematics because it provides an open space for visualising mathematical concepts in a dynamic environment.
- This idea can be reused in many ways to demonstrate to students a rich environment in which mathematical objects live.
- MTP can also help to inform classroom instruction, by educating teachers' awareness of the complexities of visual imagination of mathematics and developing steps to help students setting up and understanding visual

representations in a way that supports their learning special math topics.

References

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