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Impact of A Remedial Strategy on Trigonometrical Error Patterns- A Case Study

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Abstract Mathematics in daily life, to a large extent is problem solving. Problem solving approach which is core of teaching and learning of Mathematics, depends upon trial and error theory. The errors committed by students cannot be eliminated but reduced to certain extent by studying their causes. Teaching is a process in which a teacher follows various steps out of which two major steps are to discover the errors of students and to provide the remedy for the errors. An attempt was made in the present investigation to study the causes in case of a subject which showed minimum reduction of errors. It was found that the conceptual errors in case of the subject were not reduced.

Keywords Case study, Entry behavior errors, Perceptual errors, Conceptual errors, Computational errors, Remedial Teaching, Strategy.

The present study is the case of Gurpreet Singh which is a part of the broader study "Impact of A Remedial Strategy on Trigonometrical Error Patterns in relation to Cognitive Styles and Cerebral Dominance". Newman (1977), Casey (1978), Clements (1980), Raman (1989) classified errors in different types. In the present study, the classification given by Raman (1989) was taken. The study was experimental in nature. Percentage of reduction in errors committed by the students was studied and analyzed statistically. For qualitative analysis, some case studies were done. The present study is also one of those case studies. The subject was in the experiment group of the investigator. The subject showed minimum percentage of reduction in errors .

The subject was in tenth class of Govt. Sen. Sec. School, Khosa Randhir of Moga district. The school is affiliated to PSEB, Mohali. The health of the subject was normal and he was not affected from any serious disease. The vision, hearing and speech of the subject was also normal as observed by the investigator. Father of the subject is a farmer and mother is house wife. He has one brother studying in seventh grade. There was not a congenial environment at home. Parents of the subject quarrel each other occasionally.

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Subject usually watches television in his free time and also spends time in playing kabaddi. He took part in sports organized by school. The conduct of the subject was good and he behaved very well with his peers and elders. He did not participate in classroom interaction whereas he was active in his peer group.

Previous Achievement in Mathematics

He got 33 out of 100 marks in Mathematics in IX grade annual exams 2009.

Diagnosis

A self prepared diagnostic test of Trigonometry was administered to diagnose the errors committed by the subject in four categories i.e. Entry Behaviour errors, Perceptual errors, Conceptual errors and Computational errors.

On the diagnostic test comprising of 60 items, the subject committed total 45 errors in pre test out of which 9 were Entry Behavior, 13 Perceptual, 9 Conceptual and 14 Computational errors.

Treatment

Gurpreet was subjected to the remedial teaching of forty sessions of thirty five minutes duration each. After the treatment a post-test had been administered to the subject.

RESULTS

In the post test comprising of 60 items, the subject committed total 33 errors out of which 2 were Entry behavior, 10 Perceptual, 9 Conceptual and 12 Computational errors. It was found that there was significant reduction in Entry Behavior errors, whereas in Perceptual errors and Computational errors less reduction was reported. No reduction was reported in Conceptual errors committed by the subject in Trigonometry which is evident from the comparison of pre and post test scores and percentage reduction of errors given in Table 1.1 and Figure 1.1.

Follow Up

Mathematics teacher of the subject was guided about drill work technique in Mathematics so that he can continue to offer support in the school. Two months after the treatment the investigator visited the school again to witness the progress made by the subject. His teacher reported that he did home work

Table 1.1: Comparison of Type wise and overall errors committed by Gurpreet in pre and post tests

Types of Errors	Test	Errors Committed	Percentage Reduction
E_1(Entry Behaviour)	Pre Test	9	77.8%
	Post Test	2	
E_2 (Perceptual)	Pre Test	13	30%
	Post Test	10	
E_3 (Conceptual)	Pre Test	9	0%
	Post Test	9	
E_4 (Computational)	Pre Test	14	14.3%
	Post Test	12	
E(Total no. of errors)	Pre Test	45	26.6%
	Post Test	33	

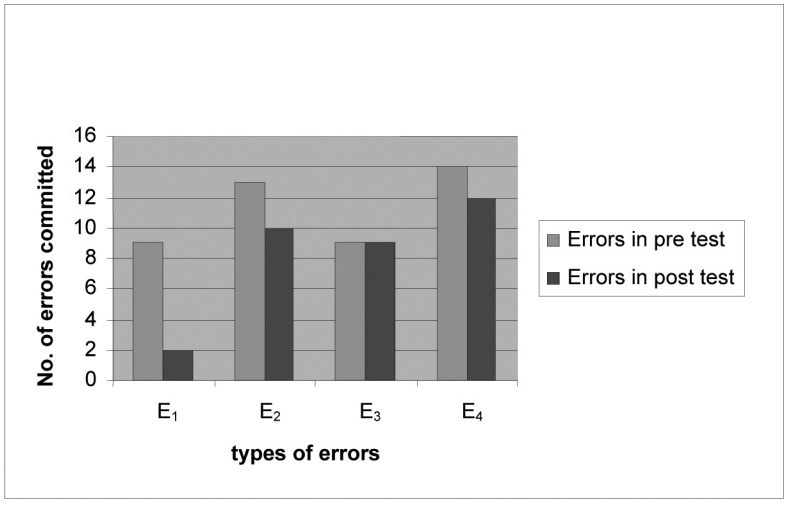

Figure 1.1: Bar Graph showing comparison of different types of errors committed by Gurpreet in Pre and Post tests

with a number of mistakes. The only change observed was that basic operations (Addition, Subtraction, Multiplication and Divison) were clear to him. His performance in the class tests after the experiment was same. The scores in class tests after the experiment are given in Table 1.2.

Table 1.2 : Comparison of performance of Gurpreet in Mathematics before and after the Experiment

Before Experiment	**May, 2010**	**July, 2010**	**August, 2010**
	04/20	09/20	08/20
After Experiment	Jan, 2011	Feb, 2011	March, 2011
	08/20	10/20	09/20

Factors or Reasons for less improvement

- Least interest of the subject in Mathematics.
- Truancy
- The subject did not solve worksheets regularly.
- Concepts were not clear to him even after subjected to the treatment.
- Carelessness during calculation.
- Lack of motivation governed by life goal.
- The subject is more interested in kabaddi than studies.

Opinion of sibling

The brother of the subject reported that he wasted much of his time in straying, playing and sometimes helping his father in his work. Only in a few days during the experiment the subject was occasionally observed doing homework. He mostly talked about Kabaddi and kabaddi players. He was very fond of Cricket. He has least interest in Mathematics.

Opinion of parents

The parents of the subject reported that he watched cricket matches on T.V. before and during the experiment. He strayed in the streets with his friends. He did not attempt home work. They gave him to do house chores sometimes. He did not want to study after 10^{th} class.

Opinion of Mathematics teacher

The mathematics teacher of the subject reported that his performance in the class was not satisfactory. He was not punctual before and during the experiment. He did not participate in the classroom discussions. He was average in the class tests. He did not attempt his home work before the experiment. After the experiment he did homework by committing a no. of errors. The teacher referral was validated by observing the note book of the subject.

Opinion of peer group

The peers of the subject reported that he did not take any type of drugs. He was very helpful. He was afraid of mathematics. There was no congenial environment at home. He did not want to study further. He wants to become a kabadi player.

CONCLUSION

After studying the case of the subject, the investigator reached at the following conclusions:

Interest of the Subject

- The subject has indulgence in unorganized street games.
- The subject has least interest in mathematics.
- The subject lacks general motivation for studies derived by life goal.
- The subject has a specific disinterest in the subject of Mathematics.
- The home environment generally is not conducive to studies and it totally lack parental encouragement for studies.

Errors

- Only 26.6% reduction in errors has been found in case of the subject.
- Maximum reduction reported in Entry Behavior errors whereas no reduction was reported in Conceptual errors.
- After the experiment, the subject managed to reduce errors in problems relating to the fundamental rules.
- The subject started participating in the classroom discussions during the last week of the experiment.

Study Habits

- The subject was usually non attentive in the class.
- Usually the subject was truant.
- The subject solved the worksheets during the experiment occasionally.

Introspection Report by the Subject

He reported that the experiment was good. The teaching during the experiment was very much different from the traditional teaching. I had little interest in mathematics. I did not want to study further. I want to become a kabaddi player. After missing the classes I used to play kabaddi in the ground. A little understanding was developed during the last week of the experiment.

Suggestions

- Specific individual treatment need to be given to the subject to check disinterest in Mathematics.
- The subject should be inspired to fix goal in life leading to general interest in studies.
- He should be made aware of the sports and studies as the complimentary in nature to achieve the life goals.

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