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Diagnosis and Remedial Teaching in Mathematics- A Review

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ABSTRACT
The main objective of the study was to find out the mistakes done by the students in Factorization, give the remedial teaching and to compare the mean score of Pre remedial test or diagnostic test and post Remedial test or posttest in the unit of Factorization. In the present study researcher select the school with purposive sampling technique. On the basis of diagnosis test 35% or below scorer students were selected for the remedial teaching. Out of 60 students 32 students were included for remedial teaching in the unit of Factorization. Researcher formed a diagnosis test to find out the mistakes. Researcher measure the effectiveness of remedial teaching with the use of posttest which is formed on the basis of content of Factorization. In the present study researcher used Experimental Research method and "Single group Pretest-posttest Experimental Design." as research design. Researcher used t-test for the comparison of pretest and posttest of the students. Students were done mistakes in various formula like, $(x + a)(x + b) = x^2 + (x + b)x + ab$, $(x+a)(x-a) = x^2 - a^2$, $(x \quad a)^2 = x^2 \quad 2xa + a^2$ and $(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ca$. As per result, Remedial teaching is effective for the better understanding the various formulas and concept clarity of Factorization in mathematics.

Key Words: diagnostic test, Remedial test, Factorization, Sampling, Experimental research, etc. Diagnosis and Remedial Teaching in Mathematics

I INTRODUCTION

Teaching of mathematics in classroom is not correlate with the computational ability of the subject but is also concerned with mathematics content and communication leading to its knowledge, understanding and application. During Instructional process in mathematics, teaching methods, strategies and pedagogic resources are much more fruitful in gaining sufficient responses from the students. For the quality in teaching-learning of mathematics, nature and quality of instructional material, teaching aids, content power of teacher, the pedagogic skills, the learning environment in classroom, the motivation of the students as well as teachers are very important.

The term "diagnosis" is commonly used in medical field, where it is defined as a careful, critical study of something to determine its nature.

According to Learning and Teaching Support Network (LTSN), diagnostic tests consist of a simple paper based test, computer generated multiple-choice questions or intelligent diagnostic systems are usually administered during the orientation week or first few weeks of the semester.

Diagnostic tests are designed to identify strength and weakness of learner with reference to specific to pics related knowledge. Diagnostic tests are more likely to focus on weaknesses than on strengths. Diagnostic tests should lead to remedial work after the instructional process. Diagnostic tests give detailed feedback about students' knowledge and understanding. Diagnostic tests provide immediate results and provide a direction for remedial teaching.

Diagnostic tests have shown to enhance students' performances in various areas of mathematics such as arithmetic, algebra, geometry etc. Some studies have also shown that diagnostic testing improves students' performance in other related tests.

Remedial Teaching can be considered as an effective correction technique, a programme to improve teaching-learning process. An instruction for overcoming difficulties andmisconceptions in various subjects. The studies revealed that Remedial Instructional Materials were effective in improving academic attainment of students. Analysis of the related studies helped the investigator in the preparation of Diagnostic test and preparing remedial teaching materials. The Analysis of studies related to Diagnostic Testing and Remedial Teaching, revealed that Diagnostic Testing in teaching can be used, as a technique for finding out the frequency and types of errors committed by students, for the correction and elimination to individual weaknesses, as a tool for finding out the reason for committing errors. It cans also beused as a prevention technique for common errors and in identifying major hindrances in learning various concepts.

II REVIEW OF RELATED LITERATURE

Sankara (1957) studied the difficulties experienced by pupils of Standard IX in factorization. The study revealed that a great majority of the pupils experienced difficulties in dealing with negative numbers, applying rules of signs, factorization of polynomials and in recognizing common factor.

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Elias (1966) conducted a study to identify the common errors committed by the pupils of standard VI infractions using a diagnostic test. The major findings revealed that a great majority of students experienced difficulty in division of fractions, especially with mixed fractions and rnultiplication and division.

Varghese (1991) studied the difficulty in learning fractions by pupils of standard VI. The study revealed that the following areas are difficult for the majority of students due to the lack of understanding of fundamental concepts: changing the whole number into a fraction; changing an improper fraction into a mixed fraction and addition and subtraction of improper and mixed fraction.

Sindhu (1996) studied the difficulties experienced by the fifth standard pupils in learning fractions. The study revealed thatmany of the common errors made by pupils were due to lack of understanding of principles involved in the addition, sub traction and multiplication with fraction and inadequate practice in doing problems in fraction.

(Carpenito-Moyet, 2007). In education, diagnosis can be explained through instructional approach where assessment provides information about students' mastery about relevant pre knowledge and skills within the domain as well as pre-conception or misconceptions about the material (Ketterlin-Geller & Yovanoff, 2009). Hence, diagnostic test can be defined as an assessment mainly used to identify students' strengths and weaknesses towards any subjects of learning (Zhao, 2013). It is a direct response to the perceived decay in the mathematical knowledge and skills of new students in relation to the mathematical requirements of their programmes of study (Appleby, Lawson, Croft, Hawkes, Douglas, &Sleeman, 2000).

III OBJECTIVES OF THE STUDY

(a) To form a Diagnostic test for Factorization.
(b) To find out the mistakes done by the students in Factorization.
(c) To give the remedial teaching on the basis of mistakes done by the students in Factorization.
(d) To measure the effect of remedial teaching in the unit of Factorization.
(e) To compare the mean score of Pre remedial test or diagnostic test and post Remedial test or posttest in the unit of Factorization.

IV METHODOLOGY

(a) **Hypothesis -** There will be no significance difference between the mean score of Pre remedial test or diagnostic test and post Remedial test or posttest in the unit of Factorization.

(b) **Research Method and Research Design-** In the present study researcher has used Experimental Research method and **"Single group Pretest-posttest Experimental Design."**
(c) **Population And Sampling -** In the present study researcher select the school with purposive sampling technique. All the students of standard 8 were selected for Diagnosis test, On the basis of diagnosis test 35% or below scorer students were selected for the remedial teaching. Out of 60 students 32 students were included in the group for remedial teaching in the unit of Factorization.
(d) **Research Tools-**Researcher formed a diagnosis test to find out the mistakes. On the basis of that test researcher decide the process of remedial teaching. Researcher measure the effectiveness of remedial teaching with the use of posttest which is formed on the basis of content of Factorization.
(e) **Process Of Remedial Teaching-**According to the diagnosis, researcher prepare remedial teaching plan for the various difficulty faced by students of std-8, With the use of specific model and teaching aid as well as continues repetition of various formula, students learn this unit and get proper understanding of whole topic. Researcher also used flap chart for reminding the specific formula during the calculation of sum related to formula. He also made various chits of all the formulas and gives remedial teaching to the students and at last researcher take a post test for the effectiveness of the remedial teaching.
(f) **Data Analysis -** Researcher has used t-test for the comparison of pretest and posttest of the students.

V RESULTS

(a) **Results of the Diagnosis Test**
(i) **In the formula, (x+a) (x+b) = x^2 + (x+b) x + ab,**
 • Students done mistakes to understand above formula.
 • Students done mistakes to do addition and subtraction in the middle term and multiplication of the last term of this formula.
 • They also done mistakes in various sums i.e. Find the values.
(ii) **In the formula, (x+a) (x-a) = $x^2 - a^2$**
 • Students were not getting proper understanding about this formula.
 • Students done mistakes to do square and calculate various types of sum based on this formula.
(iii) **In the formula, (x $-$ a)^2 = x^2 $-$ 2xa + a^2**
 • Students were putting negative sign in last term of this formula.

- Students done mistakes in multiplication of middle term.
- Students done mistakes in calculation of sums based on this formula.

(iv) **In the Formula of $(a+b+c)^2 = a^2 +b^2 + c^2 +2ab +2bc + 2ca$**
- Students were not getting proper understanding about this formula.
- They done mistakes in putting the signs during the factorization of $(a - b - c)^2$.
- Students done mistakes in calculation of sums based on this formula.

(b) Results of Remedial Teaching.
In the present study, calculated t-value is greater than table t-value2.46. So, hypothesis, "There will be no significance difference between the mean score of Pre remedial test or diagnostic test and post Remedial test or posttest in the unit of Factorization." is rejected at 0.02 level, on the basis of this we can say that mean score of posttest is higher than diagnostic test or pre remedial test. So, Remedial teaching is effective for the better understanding the various formulas and concept clarity of Factorization in mathematics.

VI CONCLUSION

This paper explains the need for proper diagnosis and remedial work for class room instruction if the failure rate in Mathematics among pupils is to be reduced. It also stresses the point that teachers have to be familiar with some of the methods of diagnosis before they can carry out remedial work with slow learners. Finally, teacher Diagnose content related problems as well as difficulty of our student and give proper remedial teaching based on results is very useful for the betterment of the mathematics knowledge and understanding.

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