

To Develop Diagnostic Test for Std. 10th Nanotechnology and its Remedial Programme

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ABSTRACT

Educational diagnostic testing is a form of assessment that occurs before instruction begins. The purpose of administering diagnostic tests is to try to determine what students already know about the concepts and skills to be covered by instruction. Diagnostic tests are not graded. Success in education is determined by the extent to which the learning objectives are realized. The progress towards attainment of objectives has to be assessed and evaluated to know where we are going. Teacher teaches all students by same teaching learning process but some student comprehended fast where some students are slow learner. We know that every student is different in learning speed and also in learning style. Every teacher should know how many learning objectives are achieved by the student. Teacher should try to find out the Weaknesses of the student. If it is possible to obtain reliable test which will describe the student's particular strengths and weakness, as well as estimate his general level of development, method of teaching learning, teaching learning tools. Such information will be of major value in guidance and in disposition of learning patients. In this research article the test which at the present time comes closest to an adequate diagnosis in 'Nanotechnology' Unit of Std. 10th Science and Technology Subject and also prepare remedial programme for removing weaknesses of student. The analysis of the obtained result showed that the Remedial Education Programme was Effective. In short, teaching learning programme become significant by Diagnostic and Remedial Programme. The present study suggests need for the analysis of every unit. It makes teaching easy and effective. The present research gives message to teachers that if the teacher constantly thinks about the creative work of finding the difficulty of his students and improving them through scientific methods then only school will be living.

1. Introduction

What is Diagnosis?

Educational Diagnosis seeks to determine the nature and causes of unsatisfactory adjustment to the school situation. It is concerned with the specific weaknesses of individual pupils. (Stanely Julian 1963)

Webster(1985) defines the term Diagnosis as, "diagnosis means identifying of error by their distinctive marks or symptoms."

Diagnosis being an important and inevitable activity of any instructional activity the teacher does it with the help of Diagnostic test. Diagnostic test holds significant place in the area of measurement and evaluation.

Characteristics of a Diagnostic test

Lindquist(1951)note general characteristics of a Diagnostic test follows:

- They must be an integral part of the curriculum emphasizing and clarifying the important objectives.
- The test items should require response to be made to situations approximating as closely as possible the functional.

- The test must be analytical and based on experimental evidence of learning difficulties and misunderstandings.
- The test should reveal the mental process of the learner sufficiently to detect points of error.
- The test should be designed to cover a long sequence of learning systematically.
- The test should suggest of provide specific remedial procedure for each error detected.
- The test should be designed to check forgetting by constant review of difficult elements as well as to detect faulty learning.
- Pupils' progress should be revealed in objective terms.

What is Remedial Programme/Works

Diagnosis is never complete without remedial work.

Webster(1985) explains the term remedial as providing or intends to provide a method or something used for putting right something that wrong.

Diagnostic and Remedial Programme

Diagnostic and remedies programme connected with each-other according this view this programme implemented in four stages.

- The construction of Diagnostic test
- Implementation and analysis of the result
- Planning for remedies programme
- Implementation for remedies programme

2. Review of literature

1. **Vaja L. M. (2008)** Construction and Checking of Diagnostic Remedial Programme for 'Universe' in Science and Technology of Std. 10th.

Objectives

- To construct a diagnostic test on 'Universe' of Science and Technology in Std. 10th.
- To know weaknesses of student in referred to 'Universe' by diagnostic test.
- Plan a remedial education to remove weaknesses in 'Universe' of student examine effectiveness of prepared remedial education to remove the remained weaknesses in education of 'Universe' in Science and Technology of Std. 10th.

Population and Sampling

Students of Std. 10th studying in educational year of 2007-2008 in Gujarati Medium high school of Una City were population. Shri Hari Om High School was purposefully selected as sample 40 student were randomly selected from the high school.

Tool

The diagnostic test was constructed.

Analysis of Data

t-test was used for analysis of data.

Findings

- Through the constructed test for 'Universe' in Science and Technology of Std. 10th, the weaknesses on all the sub-units of Universe of Students can be know.
- The achievement of the students studying with CAI was significantly higher than the achievement of the students studying with usual method.
- The remedial education with CAI was effective
- The reason behind weaknesses according to students...
 - Lake of Confirmation
 - Students get frightened for asking the questions
 - Insufficient explanation by teacher
 - Students could not take personal guidance through tuition because of poor economical condition of family.
 - Insufficient periods for science therefore complete the course very quickly.

2. **Dobaria S. V. (2007)** Construct and examining of diagnostic test for 'Environmental Chemistry' of Chemistry in Std. 11th.

Objective

- Construct a diagnostic test on 'Environmental Chemistry' of Chemistry in Std. 11th.
- By examining diagnostic test know the remained weaknesses of std. 11th Student in Environmental Chemistry of Chemistry.
- To prepare a remedial programme taking in account the weaknesses and their reasons.

- Examine the effectiveness of diagnostic- remedial programme on Environmental Chemistry of Chemistry in Std. 11th.

Population and Sample

The population consisted of students studying in educational year of 2006-2007 in higher secondary school of Rajkot city. The Std. 11th students studying in educational year 2006-2007 at Shri Jagatguru High Secondary school were selected as sample in which 35 numbers of persons were there.

Tool

The diagnostic test was constructed.

Method of Research

The experimental research method was used.

Analysis of Data

t-test was used for analysis of data.

Findings

- Through the constructed test for 'Environment Chemistry' in Chemistry of Std. 11th, the weaknesses on all the sub-units of Wnvironmental Chemistry of Students can be known.
- All the student from sample students deserved of remedial education with the view of master learning. The achievement was 50% of half number of student whereas in aspect of subject matter the weaknesses of students found in all the sub-units therefore in the aspect of subject-matter special education system with re-teaching seemed theoretically appropriate in remedial education.
- The average achievement of students on Environmental Chemistry after implementation Chemistry of Chemistry before remedial education. After the implementation of remedial programme the ratio of error significantly reduced. In this way the sample students got advantage of remedial education programme. Therefore, diagnostic –remedial programme was effective in this research.

3. Statement of the problem

The investigator stated the problem as follows:

"To Develop Diagnostic Test for Standard 10th Nanotechnology and It's Remedial Programme."

4. Objectives of the study

The objectives of the present study as follows:

- (1) To construct a Diagnostic Test on the Unit 'Introduction of Nanotechnology' of Science and Technology Subject for Standard X.
- (2) To Find out the weaknesses of the students in the Unit 'Introduction of Nanotechnology' of Science and Technology Subject for Standard X with the help of the Diagnostic Test.
- (3) To develop a lesson plan on the Unit 'Introduction of Nanotechnology' of Science and Technology Subject for Standard X.
- (4) To study the effectiveness of the remedial teaching through Lesson Plan.

5. Hypothesis

To study the effects of independent variable 'Remedial Work' on the dependent variable 'Academic Achievement' of the students the following null hypotheses was formulated and tested.

There will be no significant difference between the Mean Achievement Score of Pre Test and Post Test of the group taught through Remedial Technique after Diagnosis.

6. Diagnostic and Remedial Programme

Diagnostic and remedies programme connected with each-other according this view this programme implemented in four stages.

1. The construction of Diagnostic test
2. Implementation and analysis of the result
3. Planning for remedies programme
4. Implementation for remedies programme

7. Population

In the present study all Student studying in standard X of Gujarati Medium School in Porbandar City in the year 2008-09 were regarded as the Population.

8. Sample for study

In present Study, sample was selected by 'Purposive Sampling Technique'. As the researcher decided to work at the secondary level of school, he has to select the sampled student of the standard 10th from the sample school.

9. Method of research

The Experimental Design selected for present study was Crude Design – Single group Pre test Treatment – Post test Design. That is shown below.

Crude Experimental Design of the Study

Group	Pre Test	Treatment	Post Test
Group-1	PrT	T	PoT

Where, PrT = Pre Test (Diagnostic Test)

PoT = Post Test (Diagnostic Test)

T = Remedial Work through Model, Chart & Computer CD

A Group is selected and a pre test (PrT) is conducted to know what is the value of the dependent variable (say achievement) is the group. Then the treatment (a remedial programme) is given. After the treatment a post test is conducted and the value of the dependent variable in the group as found after the treatment in measured. The difference in the value of the dependent variable (that is PrT – PoT) is considered to be the effect of the treatment.

10. Construction of Tools (Diagnostic Test Construction)

As the first and foremost objective of the present study were to construct a Diagnostic test to know the Weaknesses of the student in the Unit 'Introduction of Nanotechnology'. Steps followed by the researcher for the construction of tool are as under.

1. Selection of the Unit
2. Analysis of the Content
3. The determination of teaching Objectives
4. Formation of Diagnostic Test
 - (1) Construction of Items
 - (2) The Construction of Piloting Diagnostic Test
5. Scoring Key

11. Remedial Programme

The weaknesses of the Student were founded after diagnostic work in the present study. The information about the weakness was known by the discussion with the student. The researcher planes for remedial work in this study there were three periods were given for the unit an Introduction of Nanotechnology. The remedial work was done by the following way (1) Lecture Method (2) Demonstration Method (3) Assignment Method (4) Group discussion and question as well as Chart, Model and Computer CD.

12. The Planning of Remedial Programme

The time date and teaching activities according content point for remedial programme on the unit an Introduction of Nanotechnology given Science and Technology Subject in Standard X is prepared in Table -1

**Table – 1
Planning of Remedial Teaching**

Remedial Teaching Day	Teaching Point	Teaching Tools	Used Educational Method
First	• The Origin, Concepts and Use of Nanotechnology	• Charts • Computer CD	• Lecture Method • Demonstration
Second	• The Concept of Dimension of Material and things • Carbon : The fundamental element	• Charts • Computer CD • Model (Carbon Bond)	• Lecture Method • Demonstration
Third	• Fundamental Carbon based nanostructure and The Bucky Ball	• Model of Bucky Ball • Charts • Computer CD	• Lecture Method • Demonstration
Fourth	• Remedial Test (Post Test)	-	-

Table-1 shows three days remedial teaching programme and its planning

13. Analysis of data

The Pre Test and Post Test were implemented on sample. The result measured by the response of the student and the

Question according the Number of True and False responses. Frequencies were converted into percentage while according to Student Achievement Score and percentages were achieved

on diagnostic test by them the student wise weaknesses were founded relation to content.

1. Analysis of Students Weaknesses in Diagnostic Test

Thirty Five Students are selected for the Experiment. The analysis of the responses of Diagnostic Test (Pre Test) was according to the points. The items in which the fifty percentage of the student could not give the correct answer there are weaknesses it is decided. The items in which there are more than fifty percentage mistake are separately scrutinize and how may student do the such types of mistake are also founded.

2. Item Wise Analysis of Weaknesses / Achievement of the Students

From the analysis of the Students responses on Diagnostic Test the investigator found out Weak Items and number of Students making mistakes.

Diagnostic Test	Total Sample	Mean	Standard Deviation	t-Value
Pre Test	40	22.30	5.55	13.91**
Post Test	40	36.52	3.32	

**Significant at 0.01 level

It is seen from the observation of the Table No. 2 that prior to the remedial Treatment the Mean Achievement Score of the Student was 22.30 and after Remedial Treatment Mean Achievement Score of the Student Was 36.52 Value of Standard Deviation of Pre Test and Post Test were 5.55 and 3.32. It was significant in favor of Remedial Teaching. To test the significance of Correlated Mean Difference t-value was calculated. t-value was 13.91, which was higher than 2.33(Significant t-value for one tailed test). Thus examining the significance of acquired results it is known that the acquired result is significant at the level of 0.01.

It can be said from Table No. 2 that Remedial Teaching had proved effective to remove the weaknesses of the students

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3. Student Wise Analysis of Achievement Score

Student's individual Scores were also obtained.

4. Effectiveness of Remedial Teaching

The null hypothesis of the present study was "There will be no significant difference between the Mean Achievement Score of Pre Test and Post Test of the group taught through Remedial Teaching after Diagnosis."

To test this hypothesis about students achievement score of the students on Pre Test and Post Test were obtained. The evaluation was done through SPSS Software. One tail t- test was done because the results of the students were same.

In Table No.2 Mean, Standard Deviation, Correlation and t-value of Score of students on Pre Test and Post Test are presented.

in the Unit 'Introduction of Nanotechnology'. The null hypothesis of the present study was rejected.

14. Conclusion

The analysis of the obtained result showed that the Remedial Education Programme was effective in the present study. In the present study the remedial teaching was done separately to traditional methods, Charts, Pictures, Models and the uses of CD programme by them the result was very effective in relation to Educational Achievement.