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ORIGINAL ARTICLE

Performance Variations of Students with Hearing Impairment on Different Types of Classroom Assessment Exercises

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Abstract:

Recent years have witnessed several changes in the assessment practices in classrooms. Teachers of today have been given a wide variety of both traditional and modern classroom assessment exercises for assessing the students' performances in various subjects. Amongst the exercises available for practice, interpretive exercises and performance based exercises are recent additions. The present study experimented to compare the variations if any in the performance of students with hearing impairment when assessed through two major types of classroom assessment exercises namely; traditional and interpretive. Quasi experimental research design was followed.

. A randomly chosen sample of thirty, fifth standard students with hearing impairment from special schools in Mumbai participated in the study. As a part of experimentation, they were taught two topics one each from Science and Mathematics which were randomly selected from the textbooks prescribed for the class. On completion of teaching, two traditional teacher made tests and two interpretive exercise based teacher made tests developed by the researchers were administered on the selected participants. Their answer scripts based on both types of exercises were assessed. The scores obtained by them were statistically treated using paired't' test to study the variations if any in their performance when assessed through the selected two types of exercises. The results revealed that performance of students in Science when assessed through interpretive exercises was found better than that carried out through traditional exercises. On the other hand, performance of students in Mathematics remained the same when assessed through interpretive and traditional exercises.

KEYWORDS

Performance variation, students with hearing impairment, classroom assessment exercises, interpretive exercises, traditional exercises

INTRODUCTION

Assessment along with teaching and learning forms the trinity of functions in the educational process. Assessment over the years has tended to be an instrument for eliciting the achievement of students including students with hearing impairment in various areas of development. Tracing the assessment practices, schools in India have been following several methods and techniques for assessing the students'

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achievement in various educational objectives. As a method, formative assessment has been the choice of majority of the schools as it provides continuous feedback to both students and teachers concerning the learning outcomes (Odunavar ,2006). As a part of formative assessment, several quantitative and qualitative techniques have been followed in schools for assessing the students with hearing impairment. The major quantitative techniques followed are orals, written works and practical. The qualitative techniques like observational techniques, interviewing, self reporting through questionnaire, case study and portfolio are also followed in some schools as a part of assessment.

Generally, the assessment in classrooms is carried out at various levels of learning set as per the Bloom's taxonomy of educational objectives. The largest proportion of educational objectives falls under cognitive domain. Hence, most of the levels of learning selected for assessment in classrooms fall under the category of cognitive domain. Cognitive domain has six specific objectives namely: (i) recall (knowledge) ;(ii) understanding; (iii) application; (iv) analysis; (v) synthesis; (vii) evaluation. The exercises based on knowledge are used to assess whether the students have gained the knowledge of facts, principles, relations etc. which are taught to them. Exercises at understanding level focus on assessing the students' ability in comprehending, translating and interpreting the knowledge gained. Exercises at application level require not only knowledge and comprehension but also skills in applying the same. Exercises at analytical level demand the breakdown of a learned matter into it's constituent elements or parts and derive relationships between them. Exercises at synthesis level involve putting together elements or parts to form whole which were not clearly there before. Exercises based on the level of 'evaluation' include the making judgments of ideas, works, solutions, methods, materials etc. (Bloom, 1956). Very often, achievement at knowledge levels of learning is carried out frequently in classrooms as compared to the other higher levels of learning. Exercises are the different test items used for assessing the performance of students in curricular subjects. There are a wide variety of exercises used in schools for assessment of students. All these exercises are developed to assess the students' performance at all levels of learning based on the Bloom's taxonomy of educational objectives. The age old exercises which are commonly used in schools are grouped under traditional exercises. Traditional exercises are the most common and widely used type of exercises followed by the teachers in classrooms for assessing the performance of students. Multiple-choice, true-false, matching, essay, short-answer types of items are the commonly used ones. All these exercises are generally considered for assessment as a part of written examinations. Traditional exercises like objective and short answer items are used very commonly in schools at all levels of classes whereas; essay test items are used only in higher classes. The regular use of these traditional exercises have enabled the teachers to identify the strengths and pitfalls of each exercise and its effectiveness in assessing the achievement of students with hearing impairment at different levels of learning based on the selected educational objectives. Research studies of Odunavar (2006), Bhagat & Mathew (2006) found that these traditional exercises are followed mainly for assessing the students achievement predominantly at knowledge ,understanding and application levels only.

Most of the traditional exercises followed for assessment are based on written works of students with hearing impairment. These exercises demand writing proficiency on the part of students with hearing impairment for expression of their answers. Many a times, the hearing loss in students with hearing impairment creates impediment, which resulted in poor language and literacy skills in them. The poor written abilities of majority of students with hearing impairment act as a hindrance in expressing the correct level of learning achieved. The teachers also tend to ignore the inherent problems associated with deafness in students and continue to follow assessment procedures which are not disabled friendly (Mathew & Mishra, 2010). All these threaten the fairness of assessment in classrooms of students with hearing impairment .

It is generally observed that, most of the items in the traditional question papers are based only on the knowledge objective of cognitive domain. The questions based on knowledge objective checks only the memory of students. This leaves a major portion of the other levels of learning for assessment. Also, this practice if continued for long term will not help in realizing all the educational objectives set for the students (Sinha, 1984). The findings of the research done by Odunavar (2006) revealed that, most of the mainstream and special schools for students with hearing impairment included only three lower level objectives from the cognitive domain while developing the question papers. The researchers found that the knowledge objective was given the maximum weightage followed by understanding and application objectives while developing questions for students with and without hearing impairment. This is also a serious concern which needs to be addressed.

The pitfalls in traditional exercises (Mathew & Mishra, 2010) have prompted the teachers to look for more exercises while assessing the students at application, analysis and synthesis levels of learning. Intensive efforts have been taken in developing various types of exercises for assessment at all levels of learning. The newly emerged exercises claim to strengthen the assessment practices followed in schools.

Majority of these exercises like interpretive exercises are not descriptive in nature and are followed for assessing the higher order skills under cognitive domain of learning (Das & Mathew, 2009).

Interpretive exercises include a set of objective items based on a common set of data .This type of test items assess the students' abilities in making inferences using passages, charts, tables, graphs, maps, and/or pictures. Drawing conclusions and making generalizations are types of interpretive activities. Linn and Gronlund (1995) mentioned that interpretive exercises recognize the relevance of information and are important to a well-rounded assessment of the students' abilities. According to them, interpretive exercise items consist of a series of selective response items based on a common set of introductory material. The introductory material may be in the form of written materials, tables, charts, graphs, maps or pictures. Such exercises measure more complex learning outcomes than is possible with other forms of selected response items. According to Linn and Gronlund (1995), learning outcomes that are included in complex achievement are (i) ability to recognize ;(ii) ability to formulate ;(iii) ability to analyze; (iv) ability to interpret ;(v) ability to combine; (vi) ability to apply and (vii) ability to distinguish.These exercises minimize the influence of a students' lack of needed factual information on measurement of complex learning outcomes. All these offer teachers to select the best suitable exercise/s for assessing each level of learning in students. Before selecting the exercises, it is very essential to see which exercise is best suitable to assess a particular level of learning amongst the existing traditional and emergent exercises.

NEED

As a part of assessing the learning outcomes, it is essential to assess both lower and higher levels of learning of students. Till recently, teachers have been using the same traditional exercises for assessing the higher level of learning in students. As an addition to this, interpretive exercises have been emerged to measure more complex learning based on higher cognitive skills than can single isolated items. The proponents of interpretive exercises claim that, it has a series of related items, which can tap greater breadth and depth of cognitive skills of students .It can measure specific mental processes and be scored objectively. Several teachers working for students without disabilities have initiated the use of these exercises to assess the higher level learning achievement of students. Teachers working for students with hearing impairment in classrooms have also realized the need for assessing the higher cognitive skills in students with hearing impairment. Before adding interpretive exercises to the existing exercises for students with hearing impairment, research based evidences are required on the effectiveness of each of these exercises and on the performance variations if any in students with hearing impairment. Such a research will help us in selecting which one to use for assessing the higher level of learning in students with hearing impairment. Hence, the present research was undertaken.

OBJECTIVES

(i) To study the variation if any, in the performance of students with hearing impairment in Science on assessment using traditional and interpretive exercises and
(ii)To study the variation if any, in the performance of students with hearing impairment in Mathematics on assessment using traditional and interpretive exercises.

EXPLANATION OF KEY TERMS

(i)Performance variation: For the present study, performance variation means the difference in performance of students with hearing impairment on assessment using traditional and interpretative exercises. Performance will be measured in terms of the marks obtained based on the traditional and interpretive exercises based teacher made tests in Science and Mathematics.
(ii)Students with hearing impairment: Students with hearing impairment are those who are studying in special schools having hearing loss of sixty decibel (60dB) or more in the better ear in the conversational range of frequencies.
(iii)Different types of classroom assessment exercises: Traditional exercises and interpretive exercises are the different types of classroom assessment exercises used for the present study.
(iv)Interpretive exercises: A series of test items given to students with hearing impairment for answering based on a given map/ picture/ passage or any other related materials.
(v)Traditional exercises: A set of test items given to students with hearing impairment for answering like fill in the blanks, answer the following test items. No other material will be provided as an additional support.

The test items included in traditional exercises are not interrelated.

HYPOTHESES

(i)There exists a significant difference in the performance of students with hearing impairment in Science on assessment at higher levels of learning using traditional and interpretive exercises and
(ii)There exists a significant difference in the performance of students with hearing impairment in Mathematics on assessment at higher levels of learning using traditional and interpretive exercises.

METHOD

Research Design : Quasi experimental research design was followed for the present study.

Sample:

A sample of 30 students with hearing impairment studying in special schools was selected randomly for the present study. The selected sample met the criteria of (i)hearing loss more than 60 decibel in the better ear;

(ii) studying in fifth standard in special schools; (iii)minimum seven to eight years of schooling ;(iv)no additional support for learning the selected subjects /topics; (v) no other additional impairment; (vi) oral-aural/total communication as the mode of communication; (vii) no specific learning difficulties or intellectual impairment and (viii) Hindi/English as medium of classroom instruction.

Tools

Two teacher made tests based on traditional exercises and two teacher made tests based on interpretive exercises in Science and Mathematics developed by the researchers were used as tools for data collection for the present study.

Treatment and procedure for data collection

The steps mentioned below in table- 1 were followed in order to teach the selected topics and to administer teacher made tests based on traditional and interpretive exercises for obtaining data on the performances of students with hearing impairment.

Table- 1: Procedure for data collection

Steps	Activity
I.	Hindi medium special schools were contacted telephonically for permission for data collection.
II.	The letter and schedule for data collection were prepared and sent to the respective schools.
III.	On, confirmation, the researcher personally visited the schools to meet the class teachers and discussed the topics for teaching.
IV.	As per the schedule, the one of the researchers with the support of respective subject teachers taught the students with hearing impairment as per the selected content of Science and Mathematics .

On completion, teacher made tests based on traditional and interpretive exercises in Science and Mathematics were administered as per schedule. However, the actual purpose of assessing the students with hearing impairment on the same content through two different types of teacher made tests was kept confidential. The answer scripts of the students with hearing impairment based on both types of teacher made tests were assessed based on the prepared scoring keys and marking schemes. As one of the objectives

of the present research was to study the performance variations, the scores obtained on each of the selected subjects were marked separately.

RESULTS

For testing the hypotheses, the values of mean, SD, paired't' and 'p' obtained for the selected pairs were calculated. Table- 4 shows the details:

Table-2: 't' test analysis

Pairs	n	Paired difference		't' value	'p' value	Result
		Mean	Std. Deviation			
Performance of students with hearing impairment based on traditional exercises in science	30	- 6.6000	4.02170	- 8.572	0.000	significant
Performance of students with hearing impairment based on interpretive exercises in science						
Performance of students with hearing impairment based on traditional exercises in Mathematics	30	- 0.4167	4.6851	- 0.487	0.630	Not significant
Performance of students with hearing impairment based on interpretive exercises in Mathematics						

From the analysis following results were obtained:

(i)There exists a significant difference in the performance of students with hearing impairment on assessment using traditional and interpretive exercises in Science. The performance of students with hearing impairment in Science on assessment using traditional exercises was found less than that on assessment using interpretive exercises.
(ii)There exists no significant difference in the performance of students with hearing impairment on assessment using traditional and interpretive exercises in Mathematics. The students with hearing impairment performed equally in both types of assessment in Mathematics.

DISCUSSION

The performance variation observed among the students with hearing impairment on assessment of their learning based on two types of exercises in Science could be looked in the light of (i) nature of the exercises used for assessment and (ii) demands on the part of students with hearing impairment to answer such traditional and interpretive test items.

An interpretive exercise consists of a a set of data or information followed by a series of questions having answers that are dependent upon the information given. The display includes pictures, paragraphs, numerical data, drawings, cartoons and so on. Generally, the questions, which accompany the display include: completion items, alternative response questions, matching exercises, multiple choice questions etc. In contrast to the traditional exercises, these interpretive exercises measure cognitive skills at higher levels of learning in an objective manner. All these features might have enabled the students with hearing impairment to perform better in interpretive exercises as compared to the traditional ones in Science.

It is a well established fact that, students with hearing impairment face difficulties in written language. Some of the research findings revealed that students with hearing impairment face several difficulties in writing. Sentences written by these students with hearing impairment tend to be shorter. Grammatical errors appear in their writing (Mathew & Mishra ,2010). All these are generally reflected in their answer scripts when assessed through traditional exercises. Hence, they tend to score less marks in

assessment based on traditional exercises. Interpretive exercises though measure higher cognitive skills of students demand less of written language on the part of students with hearing impairment. Hence, students with hearing impairment having written language difficulties find it easy to answer the questions based on interpretive exercises. The display attached to these questions gives an added advantage for these students while answering the test items. The materials provided and nature of interpretive exercises might have helped the students with hearing impairment to perform better than that in the assessment based on traditional exercises. In traditional exercises in Science, no such materials were made available to the students with hearing impairment. Hence, the difference in performance.

As against Science , Mathematics is a less language loaded subject . Hence the second result obtained could be discussed in the light of the language involved in Mathematics .One of the major objectives of Mathematics education is to develop the problem solving skills in students including students with hearing impairment. The calculations used for solving mathematical problems demand more numerical abilities than language abilities from the part of the learner. Hence, in traditional exercises, the language difficulties of students with hearing impairment might have not created any hindrance in solving the traditional exercises in Mathematics. On the other hand, interpretive exercises used tabular data and pictorial materials for assessment. It also provided an equal opportunity for students with hearing impairment to solve problems without any language barriers. Hence, they could do equally well in both types of assessment.

CONCLUSION

Traditional exercises have been used for many years to assess the lower levels of learning and to a lesser extent the higher levels of learning. With the recent emphasis on higher levels of learning and being able to apply learning to situations and problems that are more like real life, a shift has been observed in the use of exercises for assessment in classrooms. Interpretive exercises for classroom assessment is a recent addition. The present research study is the first of its kind in India to study the variations if any in the performance of students with hearing impairment on different types of exercises followed for assessing the higher levels of learning. Considering the present study as the first one of this kind, it can be concluded that interpretive exercises could be utilized for assessing the higher levels of learning language loaded school subjects. The features of interpretive exercises have impressed the researchers, teachers and students in utilizing the same in classrooms. However, findings of the present study need further confirmation on a larger sample size covering more districts before arriving at a generalization.

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