

Item Analysis of Diagnostic Test in English Language Skills of Secondary School Students

Amrita Kumari* and Prof. S.B.Bhattacharya**

*Research scholar, Faculty of Education, B.H.U., Kammacha, Varanasi-221010, U.P., India, e-mail:

Abstract: This paper deals with the analysis of diagnostic test items made by the researcher in English Language Skills at secondary level. English Language Skills include items related to Writing Skill, Reading Skill and Grammar. This analysis involves difficulty value and index of discrimination. The test consists of multiple choice questions to collect the data. Three hundred seventy students of secondary schools of CBSE and UP Board were selected randomly for the sample. The sample includes both male and female students of secondary schools. The finding shows that 54 items, out of 86, were selected, after item analysis.

Keywords: Item Analysis, Item Difficulty, Index of Discrimination, Central Board of Secondary Education (C.B.S.E.), Board of High School and Intermediate Education (U.P. Board), Uttar Pradesh.

I. Introduction

In this study, diagnosis means identifying the errors done by the students of secondary schools in English Language learning. They are intended primarily to ascertain what learning still needs to take place. In language skills testing, one can be reasonably straight forward. One can be fairly confident of one's ability to create tests that will tell whether someone is particularly weak in, say, speaking as opposed to reading in a language and vice - versa and so on. Diagnostic testing is a lengthy process in comparison to other testing tools. A diagnostic test is a test used to diagnose or reveal an individual's weakness and strength in a certain course of study (Hughes, 2003, p. 50). Diagnostic test is helpful to identify the use of faulty, round about or in correct procedures; the use of elementary processes where these could have been replaced by advanced processes.

Monroe (1965) suggested two major aspects of diagnosis in teaching. They are – (1) Determination of the extent to which educational objectives is achieved. (2) Identification of factors that may be interfering with the optimum growth of the individual. Diagnosis is an understanding of a perfect situation in terms of its causes what brought it about or in term of what it will cause.

Diagnosis is essentially the task of locating more specially those factors which bear more causal relation to the progress of learning of a pupils...the essence of educational diagnosis is the identification of some of the cause of learning difficulty and some of the potential educational asserts so that by giving proper attention to these factors more effective learning may result (Satish, 2012).

For diagnostic test was to be prepared by the researcher, pilot survey was conducted by visiting a number of schools. Heads, teachers, students, and experts in the field were contacted and their opinions were taken into consideration in order to get an insight into errors of students in reading, writing and grammar in English Language.

On the basis of review of literature, information gathered in the pilot survey and personal experience, out of 107 items compiled at the initial stage, only 10 items were rejected. Then, after pre – tryout on 30 students, some of the items were improved and some were, deleted, about errors and weaknesses of students in reading skill, writing skill and grammar in English Language. Only 87 items were retained for try-out. Majority of items were intended for average pupils. Items were scrutinized by experts for suggestions and for improvement. The draft was printed in the form of a booklet and necessary directions were printed on the cover page. Try – out was carried out on 370 students (73 from Varanasi U.P. Board, 108 from Chandauli U.P. Board, 104 from Varanasi C.B.S.E., 85 from Chandauli C.B.S.E.).

II. Item Analysis

Item analysis is a technique of item validation (Ebel, 1966). The purpose of item analyses is to examine the contribution that each item is making to the test. Items that are identified as faulty or inefficient can be modified or rejected (Hughes, 1989). The two important type of information are obtained from item analysis.

- (1) Item difficulty,
- (2) Index of discrimination,

The above mentioned two indices help in item selection for the final draft of the test. Another step which leads the calculation of item difficulty and item discrimination of a test is item selection based upon the judgment of competent persons as to the suitability of the item for the purpose of the test (Aggarwal, 1986).

Item Difficulty

The formula to be used to find Difficulty Level:

$$DL = \frac{RU + RL}{NU + NL}$$

Where –

RU= the number of students in the upper group who responded correctly,

RL= the number of students in the lower group who responded correctly,

NU= Number of students in the upper group,

NL=Number of students in the lower group,

If the item is dichotomously scored, the difficulty value of the item is equal to the proportion of persons of persons who answered the item correctly relative to all the persons tested. To compute the item difficulty, divide the number of people answering items correctly by the total number of people answering item. The proportion is usually denoted as p and is called item difficulty (Crocker & Algina, 1986). The larger the percentages, getting an item right, the easier the item. The higher the difficulty index, the easier the item is understood to be (Wood, 1960).

Item Discrimination

A discrimination index is an indicator of how well an item discriminates between weak candidate and strong candidate. Item discrimination or discriminating power of a test item refers to the degree to which success or failure on an item indicates possession of the ability being measured. It determines the extent to which the given item discriminates among examinees in the function or ability measured by the item.

Discrimination index is estimated using the following formula:

$$D = \frac{RU - RL}{NU} \text{ (OR) } \frac{RU - RL}{NL}$$

Where:

RU= number of right responses in upper group,

RL= number of right responses in lower group,

NU= number of students in upper group,

NL= number of students in lower group,

The discrimination index, D , is the number of people in the upper group who answered the item correctly minus the number of people in the lower group who answered the item correctly, divided by the number of people in the largest of the two groups. Discrimination index ranges between 0.0 and 1.0. Higher the value, more discrimination of the item is. An item having high discrimination shows high scorer corrected the item whereas students who had low test score got the item incorrect. Discrimination is important because the more discriminating the items are, the more reliable be the test.

On the basis of the review of related literature and studies, directly or indirectly related to this specific problem, it is clear that there is an urgent need to diagnose the errors related to the English language skills. Third Survey of Educational Research, (1978-1983) also states the problem that not even one diagnostic test has been prepared for English language for any school stage. It is evident that there is a scarcity of diagnostic tests in language, which demands planned and systematic efforts on the part of researcher. So, the researcher prepared a diagnostic test to reveal an individual's weaknesses and strengths in English Language Skills. For standardization of diagnostic test, item analysis is needed, so following were the objectives of the study.

III. Objective of The Study

1. To find out the item difficulty of diagnostic tool of English Language Skills of secondary school students of U.P. state of India (Eastern Part).
2. To find out discrimination index of diagnostic tool of English Language Skills of secondary school students of U.P. state of India (Eastern Part).

Sample and Tool for Data Collection

A diagnostic test was prepared by the researcher with 87 items of English Language Skills, includes Writing Skill, Reading Skill and Grammar items. However, item analysis was carried out with 86 multiple choice items, leaving out one item of composition. The present study is limited to the data collected from different schools of C.B.S.E. and U.P. Board of Varanasi and Chandauli district of Uttar Pradesh. The sample includes 370 students of secondary schools of eastern U.P. selected through purposive sampling. The sample includes both male and female students. Data sheet of students were arranged in ascending order, based on the total score, obtained by the students.

Data Analysis and Interpretations

Difficulty value and discrimination index were calculated for 370 data on each item of diagnostic tool. 27% of higher achiever students and 27% of lower achiever students were selected for item analysis. Remained

46% of data were not included in item analysis as they were representing the average score of the group. Wood (1960) stated that in computing, the discrimination index, D, first score, each student's test and rank order the test score. Next, the 27% of the student at the top and 27% at the bottom are separated for analysis. Wiersma and Jurs (1990) stated that 27% is used because it has been that this value will maximize differences in normal distributions while providing enough cases for analysis. (p.145)

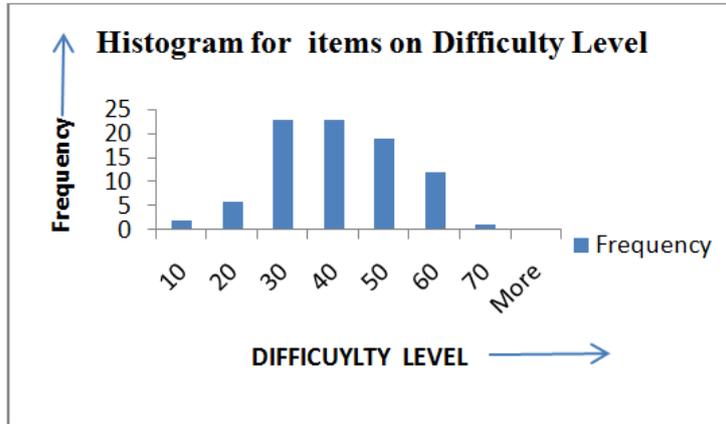


Fig. 1

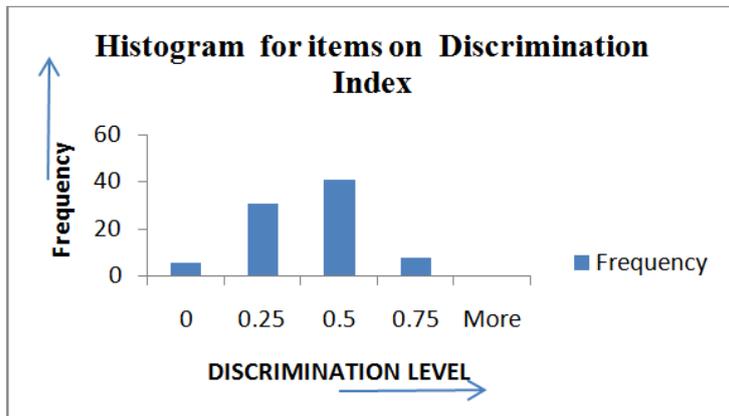


Fig. 2

Figure 1 and 2 show difficulty level and discrimination index of items. Item difficulty and Index of discrimination, formula discussed above, were used to find out the Difficulty value and Discrimination index of each item. Items, having difficulty level between 0.25 to 0.80 and discrimination power of 0.25 and above, were selected. Out of 86 items, 53 items were selected without revision, one item was added after revision and 32 items were rejected. In terms of discrimination index, .40 and greater are very good items, .30 to .39 are reasonably good but possibly subject to improvement, .20 to .29 are marginal items and need some revision, below .19 are considered poor items and need major revision or should be eliminated (Ebel & Frisbie, 1986).

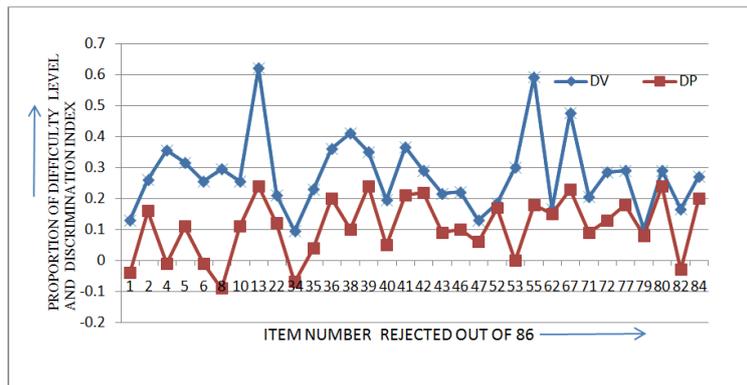


Fig. 3

Figure 3 shows the rejected items after item analysis. Blue line shows difficulty level of each item that is rejected and Brown line shows the values of discrimination index. 32 items are rejected as it were out of range of difficulty value and discrimination index. Out of 32 rejected items, 6 items were having negative discrimination and 26 items were having discrimination value lower than 0.25. Wood (1960) stated that when more students in the lower group than in the upper group select the right answer to an item, the item actually has negative validity. A negative discrimination index is most likely to occur with an item covers complex material written in such a way that it is possible to select the correct response without any real understanding of what is being assessed (Susan Matlock – Hetzel, 1997).

(R) 13: Arrange the following jumbled lines in appropriate order to complete the story:-

Mr. Jones went shopping one Saturday morning. When he was passing a radio shop, he saw a man running out with a portable radio.

- a) As soon as Mr. Jones realized what was happening, he turned round and chased the man.
- b) In a few minutes a police car arrived, and the thief was taken to the police station.
- c) The shopkeeper was shouting, ‘Stop, thief! Stop, thief!’ but everyone was too astonished to do anything.
- d) He ran as quickly as he could until he managed to catch the thief.
- e) Mr. Jones and the shopkeeper were asked to go along as witness.

The correct sequence should be:

- (A) bcdea (B) cdeab (C) cadbe (D) acdbe

Just the moon came out and they saw an owl perched up on a beam, and wiping the tears from her great, brown eyes. “Why do you weep?” asked the King.

“I am so20....., said the owl. “ I am not really a bird, but a princess. A wicked man gave me a magic drink which changed me into21.....

- (S) 20: (A) happy (B) long (C) fat (D) sad
(S) 21: (A) a sparrow (B) a woman (C) an owl (D) a man
(S) 40: It is raining. I ...an umbrella.
(A) am taking (B) was taking (C) will take (D) would take

Figure 4 contd...

(R) 41: BabarRanasanga at Kanwaha.

- (A) Had defeated (B) defeated (C) will defeat (D) defought

(R) 42: He thanked me for what I

- (A) Had done (B) have done (C) did (D) have been doing

(R) 43: I’m sure Ihim at the party last night.

- (A) Saw (B) have seen (C) had seen (D) see

(S) 44: Theywork every day at 7 o’ clock.

- (A) are starting (B) starts (C) have started (D) start

(S) 49: Youimprove your spelling.

- (A) Can (B) may (C) must (D) could

(S) 50: Welove our neighbours.

- (A) May (B) can (C) shall (D) ought to

(S) 51: Iswim across the river when I was young.

- (A) May (B) could (C) can (D) might

(R) 52: You Pay a little more attention to your appearance.

- (A) Can (B) may (C) might (D) could

Figure 4

Figure 4 shows some selected (S) and some rejected (R) items from all the three dimensions. The findings of the study show, item analysis is also a must phase for developing a diagnostic test. The study shows the process of item analysis which is helpful for test developers and teachers. The findings will help to prepare a good diagnostic and formative test for English language. Test developers found this useful to identify poor items and subsequently select items in order to compile a test. The size of an acceptable item will depend upon the length of the test, the range of difficulty indices and the purposes for which the test has been designed. Developing the perfect test is the unattainable goal for anyone in an evaluative position. Even when guidelines for constructing fair and systematic tests are followed, a plethora of factors may enter a student’s perception for test items (Keeves, 1999, p.205).

References:

- [1]. Bachman, L.F. (1990). *Fundamental Considerations in Language Testing*. Oxford University Press
- [2]. Ebel, R.L. and Frisbie, D.A. (2009). *Essential of Educational Measurement*. New Delhi: PHI Learning.

- [3]. Guilford, J.P. (1978). *Psychometric Methods*. New Delhi: Tata McGraw Hill Publication.
- [4]. Heaton, J.B. (1988). *Writing English Language Tests*. New York: Longman.
- [5]. Hughes, A. (2003). *Testing for Language Teachers*. Cambridge: Cambridge University Press.
- [6]. Lindvall, C.M. (1961). *Testing and Evaluation: An Introduction*. New York: Harcourt, Brace & World, Inc.
- [7]. Master, G.N., and Keeves, J.P. (Eds.). (1999). *Advances in Measurement in Educational Research and Assessment*. New York: Pergamon press.
- [8]. Morris, D. (2008). *Diagnosis and Correction of Reading Problems*. New York: The Guilford Press.
- [9]. Kumar, S. (2012). *Diagnostic Testing and Remediation in Reading and Writing Components in English with the Help of Self Instructional Materials at Upper Elementary Level*. Published Thesis, Maharshi Dayanand University, Rohtak.
- [10]. Khan, Yusuf. (1987). *Construction of Standardization of Diagnostic Tests in English for Standard VIII with regard to Structures*. Published Thesis, University of Nagpur, Nagpur.
- [11]. Wiersma, W. and Jurs, S.G. (1990). *Educational Measurement and Testing*. Boston, MA: Allyn and Bacon.
- [12]. Wood, D.A. (1960). *Test Construction; Development and Interpretation of Achievement Tests*. Columbus: Charles and Merrill Books Inc.