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## **The Effect of Logical Choice Weight and Corrected Scoring Methods on Multiple Choice Agricultural Science Test Scores**

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**Citation:** B. K. Ajayi (2012) “The Effect of Logical Choice Weight and Corrected Scoring Methods on Multiple Choice Agricultural Science Test Scores”, Asian Journal of Agriculture and Rural Development, Vol. 2, No. 4, pp. 514 - 518.



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### **Abstract**

The study focused on the effect of logical choice weight and corrected scoring methods on multiple choice Agricultural science test scores the study also investigated the interaction effect of logical choice weight and corrected scoring methods in schools ,and types of school in multiple choice agricultural science test. The researcher used a combination of survey type and one short experimental design. The sample for the study consisted of 600 students selected by stratified random sampling techniques in south western Nigeria. Overall performance of students in percentage, and correlation was analyzed. The hypotheses were generated and tested at 0.05 level of significance. The study revealed that there was a significant difference in the academic performance of students in logical choice weight and corrected scoring methods in multiple choice agricultural science test scores. The result also shown that there was no interaction effect on the two scoring methods in the type of schools, the location of schools in multiple choices agricultural science test. The study revealed that logical choice weight scoring method was the best method that favoured the scoring of the students' scripts in multiple choices agricultural science test. On the basis of these findings, logical choice weight should be introduced to the teachers to use in the classroom as a new method of scoring multiple choice agricultural science the logical choice weight method is recommended in the ministry of education, in Examination Division, and to junior secondary schools for scoring JSS (3) three multiple choice test. Examination bodies such as West Africa Examination Council (WAEC), National Examination Council (NECO), Joint Admission and Matriculation Board (JAMB) should adopt the use of logical choice weight method in scoring multiple choice tests. The method could be used in tertiary institutions for post 'JAMB' Unify Matriculation Examination (UME) test. It is also recommended for all states of the federation as well the West African countries public service could also adopt the use of logical choice weight scoring method.

**Keywords:** logical choice weight, corrected scoring method, multiple choice, investigated

### **Introduction**

A test may contain several items. Each item tends to confront the testee with a task to provide a means for observing its response to the task. Test has little value if the score derived from it at once time varies from the score

obtained from it in another time under similar condition. Kolawole [2005] In his own view A test is a systematic procedure for comparing the performance of an individual with designated standard of performance, thus as an instrument to elicit a sample of behavior or human traits or attributes. The trait being measured in testing may be achievement test, intelligent skill,

personality. Ebel (1979) Proposed two ways that can lead to a meaningful understanding of the term 'test' [1] There is a determination on the part of a tester to obtain information from a learner, student or consumer of information called a testee [2] The instrument used by the testee to obtain the device. He also mentioned that, there exists a relationship in continuum between the tester, the test and the testee which makes the three inseparable, the tester must have made the decision to obtain information from the testee. He then prepares the applies a 'test'. He also went further that the tests that are given in education and psychology are planned with intentions. The tests are directed forward attainment of specified objectives. Tests are not given without purpose.

Achievement test serves as a psychological instrument which the school teacher applies to find out the amount of knowledge this students have acquired in a specific course of study at a specific time. Achievement test consists of essay and objective test and of these two; the essay format requires learner or testee to write a sentence, paragraph or long passage which demands as subjective Judgment regarding the quality of the written statement, while objective format is divided of subjectively because every expert arrives at precisely the same score. In primary, junior secondary school levels and entrance examinations to secondary and tertiary institutions objective test is the most commonly used test formats.

According to Ajayi (2007) scoring is a method of assigning marks to any correct option in item scoring can aid in making proper choice. According to Ajibola (2003) logical choice weights are methods of scoring multiple choice tests in which differential weights are assigned to items options according to a priori assessment of the degree of correctness of each option by expert judgment. It involves awarding partial credit for partial information while the key option is assigned a weight of one.

According to Ebel (1965) in his contribution logical choice weight scoring method took into cognizance each of the options and the degree of closeness to the key. He explained that in an item having four options and D is the key, D will be assigned (marked if any of the response

is closer to D, it will be assigned 0.75 and the next closer to D, will be assigned 0.5 while the last option will be assigned Zero (0). Therefore logical choice weight scoring method favoured students score.

Corrected scoring method according to Ried (1970) Stated that any multiple choice test in order to obtain success score there must be a penalty for guessing and consequently derived a formula to adjust for underserved score as follow:

$$Sc=R-(W/N-I)$$

Where Sc=Success Score

R= right response

W= wrong response

N= number of alternative response

Rowley and Traub, (1977) In his own contribution he observed that in practice when the formula is applied, a considerable number of low ability students tend to emerge with -ve corrected scores.

### **Statement of Problem**

The effect of logical choice weight is more or less test specific. Knowledge and capacity learn usually involve the use of tests, logical choice weight method is a new method of scoring.

Stanley and Wang (1970) reported that though item weighting had not been successful in significantly increasing the reliability and validity of a composite measure, the differential weighting of responses within items appears promising. Afolabi (1990) however confirmed this expectation when he found out that logical choice weighted scores are more reliable and more valid than corrected score in Agricultural Science tests. The fundamental principle employed in corrected score is that students score should be proportional to the average number of in-corrected alternative which he can eliminate which means any student who failed to choose the correct answer will be penalized. Chopping (1975) added that the scoring formula (sc) that is continually used to correct for guessing or chance success does not take account of when a testee acts on the basis of misinformation, and chooses the answer the 'Knows' to be 'right', even though it is wrong. It is argued that students would usually not be

guessing blindly, but rather choosing what seems plausible to them.

In this study the following questions were raised

- (1) what is the overall performance of students in the two scoring methods
- (2) Which of the two scoring methods give the best performance?

### Research Hypotheses

Based on the statement of the problem the following research hypotheses were raised.

**H<sub>01</sub>.** There is no significant difference in the overall performance of students whose script were marked with logical choice weight method and those marked with corrected scoring method in multiple choice agricultural science test

**H<sub>02</sub>.** There is no significant relationship between the students whose scripts were marked with logical choice weight method and those marked with corrected scoring method in multiple choice Agricultural science tests.

### Methodology

Using stratified random sample technique a total of 600 students were selected from South Western Nigeria. The research instrument used for the study were two different formats of multiple choice Agricultural Science tests, each of the test was made up of 60 items with four alternative options to each of the test item was A, B, C, and D with different instructions and different methods of scoring, after the test items were drawn from standardized achievement test constructed by West Africa examination council (WAEC) for the logical choice weight it was 0.753, for corrected scoring method it was 0.624. Using Pearson product moment correlation, a coefficient of stability of 0.86 in logical choice weight and 0.510 in corrected method were found.

### Discussion

The results from the data analysis were discussed on the basis of the stated research hypotheses. The findings of the study showed

that there was a significant difference in the academic performance of students in two scoring methods of multiple choice agricultural Science test scores academic performance of any group of students is a product of many variables including innate abilities of inherited intelligence reinforced or inhibited by environment the findings of this study was in line with Strashny (2002) in his own study, he mentioned that scoring in multiple choice tests are better in differentiating the academic performance of students. Ajibola (2003) found that logical choice weight scoring capable of improving the ability of a test to reflect the degree of knowledge students have on the items. Despite the fact that logical choice weight scoring method was time consuming and laborious, still it had significant effect in multiple choice agricultural science test scores. Hawbleton et al (1970) found that empirical choice weighting greatly increases internal consistency reliability than logical choice weighting while logical-choice weighting has a slight tendency to improve validity, even though the effect of logical weighting is more or less test specific. Also the finding of the study indicated that there is no significant relationship between the performance of students whose scripts were marked with logical choice weight and corrected scoring method

### Conclusion

Based on the results of the study the following conclusions were drawn, logical choice weight had the highest percentage which is above average as a result of this, it was found to be the best method of scoring multiple choice agricultural science test scores, and the method favours student

### Recommendation

Based on the findings and conclusions of the study, the following recommendations were made:

- (1) Logical choice weight method should be introduced as new scoring method

- (2) The logical choice weight method could be used in tertiary institutions for scoring, ‘JAMB’, ‘Post-UME’ tests.
- (3) Examination bodies such as ‘WAEC’, ‘NECO’, and ‘JAMB’ should adopt the use of logical choice weight scoring method.
- (4) The method is also recommended in the Ministry of Education, Examination division to use the method to score JSS3 examinations.

**Analysis of Data**

**Table: 1 overall performance of students in two scoring methods**

Variable	No of classes	Mean 60 marks	SD	Range	Score	%
Logical choice weight method	300	33.31	7.242	44	0.67	75%
Corrected scoring method	300	27.15	6.892	38	-0.18	43%

Table one shows the overall performance of agricultural science students in multiple choice tests. The logical choice weight method had the mean of 33.31 while the corrected scoring method had 27.15 in the Z-score logical choice

weight method has 75% which is above average but in corrected score of 43% In the final analysis, logical choice weight scoring method favoured the students than the corrected scoring method.

**Table: 2 correlation analysis between logical choice weight and corrected method**

Variable	Number	R <sub>cal</sub>	R <sub>table</sub>
Logical choice weight method	300	0.182	0.195
Corrected scoring method	300		

P>0.05 (Result not significant)

Table 2 shows that the r cal was 0.182 which is less than the r tab value of 0.195 therefore there is no significant relationship between logical choice weight and corrected scoring methods. Thus the null hypothesis was accepted.

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