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Comparison of Logical Choice Weight and Confidence Scoring Methods on Multiple Choice Agricultural Science Test Scores

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Abstract
The study investigates the comparison of logical choice weight and confidence scoring methods on multiple choice agricultural science test scores. The purpose is to find the most advantageous method to be used out of the two methods of scoring multiple choice agricultural science tests. The study also focused on the interaction effect of logical choice weight and confidence scoring in the schools. The researcher used survey type and one short experimental design. The population is consisted of 600 (six hundred) Senior Secondary School (SSS3) agricultural science students as sample in Ekiti Central of Ekiti State, Nigeria. The hypotheses were generated and tested at 0.05 level of significance. Using correlational and descriptive analysis. The study revealed that there was a significant relationship between logical choice weight and confidence scoring methods. The study revealed that logical choice weight scoring method was the best method that favoured the scoring of the students scripts in multiple choice agricultural science test. The logical choice weight method could be used in tertiary institutions for Post- JAMB test. Consultancy firms and public service could also adopt the use of logical choice weight scoring method.
Keywords: Multiple choice, confidence, logical choice weights, scoring, standardized.

1. Introduction

Testing involves a systematic sample of an aspect of behaviour from which a wide range of behaviour may be inferred. The trait being measured may be achievement, intelligent skill, personality, aptitude or interest.

Objective test is the most commonly used test format in primary, junior and senior secondary school levels, also in entrance examinations to secondary and tertiary institutions.

This type of test is also widely used by classroom teachers. There is the tendency of many people to have a low opinion about objective test, because of the belief that a student may guess an item right without a complete knowledge of correct response and especially in the selective objective types.

Burton (2004) argued in favour of the guessing correction nothing that it may improve the ratio of the matching, it is very good for measuring recognition and recall matching items like true – false tends to cover factual information. It is usually a bit difficult to construct and good for option of many items which equally encourage time and space. Matching type test required the students to match a stem or stimulus to the appropriate response or alternative. True – false test type is popular with classroom teachers. The basic reason being that it provides a simple and direct means of measuring the essential outcome of formal education. In true-false test type, the opinions are provided which students have to choose the cored response to an item. Oladunni (1996) viewed true- false items as a declarative statement that testees are to support or oppose. The pupils are expected to state whether the statement is true or false. He added that the true-false test has been widely used in classroom largely because teachers can score objective items rapidly as against essay type of items. Denga (1987) and Oladunni (1996)) claimed that other dimension used for the response include right/wrong, correct/incorrect, agree/disagree and yes/no. True – false test encourages students to memorize rather than understand and does not measure the higher mental processes. Alex (2002) in his findings tests with two answers per question better able to differentiate students than test with higher number of answer per question.

Oladunni (1996) opined that multiple choice type of objective type of test is useful for measuring both the lower order and the higher order mental processes. Ajayi (2012) mentioned that multiple choice question is generally recognized as the most widely applicable and useful type of objective test item. Multiple choice, according to Gregor Socan (2009) mentioned that it is a popular and sometimes virtually inevitable item format in the area of knowledge, aptitude and ability testing or more generally in the testing areas where the maximal achievement is of interest and the response speed is not of cardinal importance.

Dressel and Schmid (1953) the author trailed four variants of the standard multiple choice test the free-choice

test. Here, the students were required to mark as many choices as they thought necessary, so as to ensure that they had not omitted the correct answer. Secondly, degree of certainty test. Here, the students had to indicate on a scale of 1-4, how certain he was that his one choice was correct. Thirdly, multiple-answer test, here, any item mighty have more than one correct answer, the student had to mark the choices he thought were correct. He would get credit for correct answer and be penalized for any incorrectly marked answers. Fourthly, two answer tests, here, two of five responses were correct , students total score consistent of all their correct responses then the authors report that there were evidences that students were require to examine more critically the test items, when one of the modified factors was used.

Wilson and Case (2004) viewed that multiple choice examinations after placed undue emphasis on recall and stimulate students to learn in a like mode. On the positive side scoring reproducibility for multiple choice question is excellent and many topic areas can be sampled in a short time.

Justified multiple choice is another modification of multiple choice questions. In this form, the students are required to justify choices and in some cases refute incorrect options.

This form of multiple choice assessments provide an opportunity for the teacher to see if the student really knows the answer or is just guessing.

There are variations of the multiple choice format, these are, one correct answer, best answer and reverse type. In one correct answer type, the testee is required to select one correct answer listed among several plausible options.

Hopkin and Stanley (1981) stressed that the most important skill in constructing good multiple choice item, is the ability to devise plausible attractive distractors.

The task required of the testee is to select or choose the correct responses that most satisfactory answer the question or complete the statement as the case may be.

Example i, the upper most layer of the earth surface in which plant find a home for their life and growth is called … (a) leaching (b) Evaporation (c) soil (d) marine (e) inorganic.

In the best answer type, there may be more than one key to the item but one of the distracters is the most correct to them.

Example ii, the method that can be used to maintain or improve the soil fertility is (a) growing of cover crop and crop rotation (b) crop rotation and drainage (c) application of fertilizer and planting cover crop (d) crop rotation (e) none application of organic manure. The key to the item is option (b).

The reverse type is the direct opposite of the simple correct answer in that all but one of the options is correct.

Example iii, which of the following is not advantages of crop rotation;
(a) it protect the soil surface from direct heat of the sun
(b) it aids nutrients like nitrate into the soil, through legumes cover crop.
(c) it helps to control weed
(d) it helps to increases surface runoff and allow soil erosion
(e) it protects the soil from rain action.

This variants may be used when it is easier to construct three or four keys to a given items than it is to prepare adequate number of distractors. There are various methods of scoring, out of which, the two scoring methods would be discussed as follows; (a) logical choice weight scoring method. (b) confidence scoring method.

Kolawole (2001) suggested that in scoring the test examiners should prepare a comprehensive marking schemes for the test and make sure that all points in it are carried out to the last letter. He went further that in multiple choice items scoring, the following should be carried out;

- List out the keys(correct answer) in corresponding to the item number
- Assign weight for each test item
-

If you wish to discourage guessing, you may apply formula for the correct score above.

In confidence scoring method, Boyinbode (1986) studied the effects of confidence level on some psychometric

property of true -false test answers. He found that testee scores were most valid (r= 0.290) when only the items answered by radian guessing were excluded and least valid (r = 0.236) when answers were made on the basis of absolute confidence. There are three levels of confidence proposed by Soderquist (1936) the levels range from absolute confidence through partial knowledge to random or blind guessing. Subjects response would then be scored thrice with the exclusion of the answers made by random guessing and with only the answers made with absolute confidence. Logical choice weight is another scoring method.

According to Kolawole (2011) as it was cited in Ajayi(2012) mentioned example of scoring through logical choice weight thus; if the item is five options, if testee get the correct option, testee obtains one (1) mark, second best option 0.75, third best option 0.50, fourth best option 0.25, fifth best option would be zero (0).

Suppose, it is the four (4) options, if testee gets the correct option, testee obtains one (1) mark, second best option, testee obtains 0.67, third best option, testee obtains 0.33, the fourth best option ,testee obtains (0) zero. Richard (2003) made mention of alternative methods of scoring which promotes higher level of thinking, includes questioning, labeling and relating. Higher levels according to him, it is self-correcting. It also yield two scores, knowledge and judgment, what is known and how well it is known.

2. STATEMENT OF THE PROBLEM

It is a well observed fact that knowledge and capacity to learn usually involve the use of tests. The scores are often impaired by some determinants of objective test. Alex (2002) mentioned that various scoring methods have been developed to control some of those factors, such as confidence scoring method and logical choice weight method. Confidence scoring method is the method in which testee was certain with which he attempts a test item. Subject responses would be scored thrice with the exclusive of the answer made up random guessing, testees response will therefore be based on his degree of certainty. The scoring of this method it's not easy, it is time-consuming. As a result of this, teachers run away from this method.

The logical choice weight scoring method took into congnizance each of the options and the degree of closeness to the key. According to Ajayi (2007) using logical choice weight in scoring multiple choice agricultural science test is cumbersome, and time consuming.
In view of the above, the following research questions were raised
1. which of the two scoring methods give the best performance?
2. what is the overall performance of students in the two scoring methods?

2.1.Research hypothesis;

The following null hypothesis was generated and tested in this study.
H_{O1}: There is no significant relationship between the performance of students whose scripts were marked with logical choice weight scoring method and those marked with confidence scoring method in multiple choice agricultural science test.

3. Methodology

The research design used in this study was the survey type. This design enabled the researcher to compare logical choice weight and confidence scoring methods in multiple choice agricultural science test. The population consisted of all the senior secondary schools students that offered agricultural science during the year 2007/2008 academic session in Ekiti central. The sample consisted of six hundred (600) students by using stratified random sampling. Sixty (60) items were administered to six hundred (600) students, three hundred (300) to attempt items based on logical choice weight and another three hundred (300) to attempt items based on confidence method. The scripts were collected and scored based on the methods. There are two different formats of multiple choice agricultural science tests used. Each of the tests was made up of sixty (60) items with four alternative options A,B,C,D. The test items were drawn from standardized achievement test constructed by West Africa Examination Council (WAEC), one shot design was used on two groups, each group was made up of three hundred (300) testees and were given items to answer, for instance three hundred (300) students were given items which involved logical choice weight method and three hundred (300) students for confidence scoring method. The same items were given to all the two groups, but with different methods of scoring.

Scoring is the method of assigning marks on the items answers by the students. The researcher used the key prepared for each format to score the items such as in logical choice weight, certain weight was assigned to any corrected option. The option was scored based on the weight responses depending on the degree of correctness of the response on its relevant and closeness to the key, one (1) was the highest score assigned to the most corrected option. If for example in an item having four options A,B,C,D and D was the key. D would be

assigned one (1) mark, if A's response is closer to D which is the key, it would be assigned 0.75, if B's response is next closer to D it would be assigned 0.5 while the last option would be assigned zero (0).
In confidence scoring method one mark was assigned for correct answer picked by the students, each script was scored thrice i.e absolute confidence + correct response=1mark
Partial knowledge +correct response=0.75marks
Random guessing +correct response =0
In confidence scoring method, example has to indicate on his answer scripts the level of certainty with which he attempts a test items.

4. Analysis of Data

Table 1, showing the overall performance of agricultural science students in logical choice weight and confidence scoring methods.

Variable	No of cases	Minimum	Maximum	Mean 60 marks	Std. Deviation	Range	Z-Score	%
Logical choice weight method	300	14	58	33.31	7.242	44	0.67	75%
Confidence scoring method	300	6	40	26.31	6.269	34	-0.33	37%

The general questions raised were subjected to descriptive analysis. There are six hundred (600) cases, three hundred (300) students for logical choice weight and three hundred (300) students for confidence scoring. The logical choice weight method had minimum of 14 and maximum of 58 while the confidence scoring method is minimum of 6 and maximum of 40.

In logical choice weight scoring method, it had the highest means of 33.31(75%) while confidence scoring have mean of 26.31(37%) which implies that the students performed best in logical choice weight than confidence scoring method. Also logical choice weight had the standard deviation of 7.242 with range of 44, which means is more spread. While confidence scoring method is having standard deviation of 6.269 and range of 34. The score for logical choice weight is 0.67 and confidence method is having -0.33. In view of this logical choice weight had the overall performance of students in agricultural science .

Table 2 Shows the percentage of the best performance.

	No of cases.	mean	Standard deviation	%	N
Logical choice weight	300	33.31	7.242	75%	25% above average
Confidence	300	26.31	6.269	37%	13% below average

The table above shows that logical choice weight had the highest mean of 33.31with the percentage of 75 which is 25% above average, the mean for confidence scoring method was 26.31 with 37 percent and 13% below average. This shows that logical choice weight scoring method had the highest percentage and has the best performance.

Table 3; correlation analysis showing significant relationship between confidence scoring and logical choice weight scoring methods

Variable	Number	r_{cal}	r_{table}
Confidence	300	0 .240	0.195
Logical choice weight	300		

P<0.05(significant result)
Table 3 shows that the r_{cal} was 0.240 which is greater than r_{table} of 0.195.
Therefore, there is a significant relationship between logical choice weight and confidence scoring method. Thus the null hypothesis was rejected.

5, Discussion

The students whose scripts were scored with logical choice weight had the overall performance and also had the best performance than the students scored with confidence scoring method. The results from the data analysis were discussed on the basis of the stated hypothesis. This study showed that there was significant relationship between the performance of students whose scripts were marked with confidence scoring methods. That means the level of those students had effect on their performance. In another study carried out by Ajibola (2003) found that logical choice weight scoring capable of improving the ability of a test to reflect the degree of knowledge that students have on the items. As it was cited in Ajayi (2012) the logical choice weight scoring method provides a wide academic latitude for students to make themselves vulnerable, thereby promoting positive effort, risk taking and self belief which are perhaps essential for success in life. Despite the fact that time-consuming and laborious still it had significant effect in multiple choice agricultural science test scores.

6. Recommendation

With references to the findings of this study, the following recommendations were made.

1. Logical choice weight scoring method could be used in tertiary institutions for post-Joint Admission and Matriculations Board (JAMB) test in Nigeria and admission procedures in other countries.
2. Public service examinations, the ministry and training institute should also adopt the use of logical choice weight method of scoring.
3. Schools should adopt the use of logical choice weight method of scoring subject teachers.

References

Ajayi B.K (2007) The effect of four scoring methods on multiple choice Agricultural science test scores. Unpublished Ph.D thesis, University of Ado- Ekiti, Now Ekiti State University.

Ajayi, B.K (2012) The Effect of Two Scoring methods On Multiple Choice Agricultural Science Test Scores. Review of European Studies Vol.4, No.1 march 2012,

Ajibola A.A 2003 Effect of Logical choice weight on the psychometric properties of multiple choice test among secondary school students in Osun State. Unpublished M.Ed thesis, Obafemi Awolowo University, Ile-Ife.

Boyinbode, I. R (1986) Effect of Confidence Level on Some Properties of true-false test answers. Nigerian Journal of Education psychology l l. Response changing behavior in two objective test format. An unpublished Ph.D thesis. Institute of Education, university of Ibadan, Ibadan .

Burton, R.F (2004): Multiple Choice and true-false tests; reliability measures and some implications of negative marketing , Assessment and Evaluation in Higher Education 29, 585-595.

Denga, D.I (1987), Educational Measurement Continuous assessment and Psychological testing, Calabar; Rapid Educational publishers (Nig) Ltd.

Dressel, P.L and Schmid J (1953) Some modification of multiple choice items. Educational and psychological measurement. 13,574-595.

Kolawole E.B (2001) Test and Measurement. Yemi Prints and Publishing Services, Ado-Ekiti.

Kolawole E.B (2011); Principles of tests construction and Administration Bolabay Publications, Lagos.

Oladunni M.P (1996); Test measurement and Evaluation in Education Ibadan, published by Demilade Omotayo, 26-31

Richard, A.H (2003): Alternative scoring of multiple-choice Tests and Higher levels of thinking.

Soderquist, M.O (1936) Anew method of weighting scores in A true-false Tests. Journal of Educational Research Association.

Hopkins, K.D and Stanley, J.C (1981) Educational and psychology measurement and Educational Englewood cliffs, New Jersey, prentice Hall

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