

## The Effect of Number Right and Corrected Scoring Methods on Multiple Choice Agricultural Science Test Scores

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**ABSTRACT** The study investigated the effect of number right and corrected scoring of multiple choice Agricultural Science test scores in order to find out more favourable methods of scoring Agricultural Science test. The study also investigated the interaction effect of two methods of scoring in schools, location, sex and types of school in multiple choice of Agricultural Science test. The research design used in this study was survey type and one short quasi experimental design. The samples for the study consisted of 600 students selected by stratified random sampling techniques in south-western Nigeria. Two hypotheses were generated and tested at 0.05 level of significance using correlation analysis one-way ANOVA and 2-way ANOVA. The result of the analysis showed that, there was no significant relationship between the performance of the students whose scripts were marked with number right scoring method and those marked with corrected scoring method in multiple choice Agricultural Science test. The result also showed that, there was no interaction effect on the two scoring methods and in the type of schools, but there are significant difference in location of multiple choice Agricultural Science test. On the basis of these findings, number right scoring method should be introduced instead of corrected scoring method to the teachers in the classroom as a method of scoring multiple choice agricultural science. The number right scoring method is recommended in the ministry of Education, in Examination Division and to Junior Secondary Schools for scoring (JSS) three (3) examinations, also in Tertiary Institutions and Examination bodies such as National Teachers Institute (NTI), Joint Admission and Matriculation Board (JAMB), National Examinations Council (NECO), and West Africa Examination Council (WAEC) should continue using number right scoring method.

### INTRODUCTION

There are so many methods of scoring multiple choice tests in primary, secondary and tertiary institutions of learning. Multiple choice test items have gained considerable popularity among constructors of standard test. It is also generally known as the most widely applicable and useful type of objective test item. It is a good measuring instrument for measuring complex outcomes in the knowledge, understanding and application areas.

Rebecca (2012) agreed that the multiple choice item is widely used in the cognitive domain of learning in our schools and in both national and public examinations such as West Africa Examination Council (WAEC), National Teachers Institute (NTI), Joint Admission and Matriculation Board (JAMB), and National Examinations Council (NECO). Mike (2012) opined that multiple choice tests can be objective test or easy format, easy format requires the learner or testees to write sentences, paragraph or long passage which demands subjective judgment regarding the quality of the written statement, while objective format is devoid of subjectivity because every expert arrives at precisely the same score.

Gbeleye and Akinyemi (1995) labeled objective test as selected response test. It is the commonest form of test used to evaluate students learning activities or achievements nowadays. Objective tests are otherwise called the select type. It involves presenting examination question and alternative.

The tests are to make free choice of one correct or best answer from the alternatives given to a question. The objective test is the most commonly used test format in all school levels, also in entrance examinations to secondary and tertiary institutions.

Teachers have an obligation to provide for their students with the best possible instruction, in administering test and measuring ability of the student in the school system.

The scoring of the response must be done according to the test manual. These two methods of scoring tend to reveal the best method that would favour the students in multiple choice Agricultural Science test scores. A multiple choice item consists of a problem and a list of suggested solutions. The problem is usually stated as a direct question or an incomplete statement, which is called the stem of the item, the list of possible answers, are called alternatives or options. The correct option to an item is re-

garded as the key to the item and the remaining options are called distractors.

### Objectives

The objective of the study focused on number right scoring method and corrected scoring method. It was also aimed to investigate the overall performance of students in two scoring methods which are number right and corrected scoring methods. Then, to identify the best scoring method that would favour the students.

### Statement of the Problems

It is well observed that knowledge and capacity to learn usually involve the use of tests. Most examination bodies make use of number right scoring method to score multiple choice tests, due to the fact that the method is easy to score. The fundamental principles employed in corrected score is that students are scored in two ways, to promote low levels of thinking and higher levels of thinking.

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Henk et al. (2010) argued that number right scoring method is the simplest way of assigning mark to objective test item. In view of Ajayi and Omirin (2012), number right is a way in which the examiner assigns one score to any correct option picked by the examinee and zero is awarded for incorrect option, the number of scores would be placed over the total number of the items. Number right scoring method =

$SI=R$ , Where R is the right answer, SI is the Score. Take for instance an examinee gets 10 items right out of 20 items. His scores is 10/20 or 50% or  $10/20 \times 100 = 50\%$ .

This is the commonest method used in all institutions of learning and examination bodies, example; National Teachers Institute (NTI).

A test may contain several items, each item

tends to provide a means for observing its response to the task.

It is not an over statement to say that test has little value if the score derived from it at one time varies from the score obtained from it in another time under similar condition. Alonge (1989) explained testing as a technique of identifying or assessing certain human behaviour or traits which include attitude, performance and interest.

In multiple choice items, students have to read widely and have confidence in any option to pick. The corrected scoring method is an attempt to eliminate guessing in a multiple choice test item, in order to choose test item, there must be a penalty for guessing and consequently derived a formula to adjust for underserved score as follow:

$$SC = \frac{R - W}{N - 1}$$

Where SC = success score

R = right response

W = wrong response

N = number of alternative responses

The intricacy in this method is that examinees are not penalized for unanswered item. Kolawole (2011) opined that corrected method is where testees are penalized by  $1/n-1$  mark where he chooses a wrong option. In corrected scoring method, the student score is 8/20 or 40% or  $8/20 \times 100 = 40\%$  while in number right he would score 10/20 or 50% or  $10/20 \times 100 = 50\%$ .

Where n is the number of the option in an item. The trait being measured, they may be achievement, intelligent skill, personality aptitude or interest.

Achievement test serves as a psychological instrument which the school teacher applies to find out the amount of knowledge the students have acquired in a specific time. It consists of essay and is proportional to the average number of incorrect alternatives which he can eliminate. Which means any student who failed to choose the correct answer would be penalized. One-way ANOVA is used to show the significant difference among the performance of students in number right scoring method and in corrected scoring method.

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 gives a better performance?

### Research Hypotheses

Based on the statement of the problem, the following research hypotheses were generated.

1.  $H_{O_1}$ : There is no significant difference in the performance of students whose scripts were marked with number right scoring method and those marked with corrected scoring method in multiple choice Agricultural Science test scores in (Ekiti State).
2.  $H_{O_2}$ : Number right scoring method and corrected scoring method would not have interaction effect on the type of school in multiple choice Agricultural Science test scores.

### METHODOLOGY

Using stratified random sampling techniques, 600 students were selected from South Western Nigeria. The research instruments for the study were two formats of multiple choice agricultural science test, each of the test made up of 60 items with four alternative options. Each item of the test contained A,B,C,D with different instructions and different methods of scoring. But in this study, two methods of scoring were considered; number right scoring method and corrected scoring method. Number right scoring method occurs where the students or testees would obtain either one (1) or zero (0) in a particular item. A point (1) is awarded for correct option and zero (0) is awarded for incorrect option. Example; suppose a student gets forty-two (42) correct out of sixty (60) items where there were four (4) options. In number right, the student scores  $42/60 \times 100 = 70\%$ . In corrected score method, he scores 60%. while the final score would be equals to twelve (12).

The test items were drawn from standardized achievement test constructed by West African Examination Council (WAEC). The validity coefficient of the number right scoring method was 0.324, the corrected scoring method was 0.624. Using Pearson product moment correlation, a coefficient of stability of 0.462 was

obtained in number right scoring method while 0.510 was also obtained in corrected scoring method.

### RESULTS

Table 1 shows One-way ANOVA showing the significant different among the performance of students in two scoring methods, It was indicated that between groups the sum of square was 3608.80 with 3 degree of freedom and mean square of 1202.93. Within group, the sum of square of 15352 was obtained with degree of freedom of 392 and the mean square of 39.16 Total of 18961.66 was calculated in sum of square between groups and within groups with 395 degree of freedom. Then, the  $F_{cal}$  of 30.74 and  $F_{tab}$  of 2.60 was calculated. Therefore,  $F_{cal}$  was greater than  $F_{tab}$ .

$F_{cal} > F_{tab}$   $P < 0.05$  (Significant Result)

The Null hypothesis was rejected since  $F_{cal}$  was greater than  $F_{tab}$  which means, there was a significant difference in the performance of students in two scoring methods.

The result of Table 2 shows that in single sex school, the total overall means was 25.35 with standard deviation of 5.436, while the total means score in mixed school was 23.15 with a standard deviation of 5.790. This indicates that two scoring methods and the types of school which are single sex and mixed school had no significant interaction effect on the students performance, since  $T_{cal}$  was 0.161 while  $T_{tab}$  was 1.76.  $T_{cal}$  was less than  $T_{tab}$ . The null hypothesis was not rejected.

### DISCUSSION

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

The findings of this study shown that there was no significant relationship between the performance of students whose scripts were marked with number right scoring method and those marked with corrected scoring method in mul-

**Table 1: One-way ANOVA showing the significant difference among the performance of students in two scoring methods of multiple choice agricultural science test in Ekiti State**

	Sum of square	Df	Mean square	$F_{cal}$	$F_{tab}$
Between groups	3608.795	3	1202.932	30.74	2.60
Within group	15352	392	39.162		
Total	18961.664	395			

$F_{cal} > F_{tab}$   $P < 0.05$  (Significant Result)

**Table 2: Two-way ANOVA summary of two scoring methods on the types of school**

Type of school	Type of scoring	N	Mean	Et Dec.	$T_c$	$T_r$	R
Single sex	Number right scoring method	30	27.40	5.834	0.161	1.76	NS
	Corrected scoring method	30	25.80	5.974			
	Total	60	25.35	5.436			
Mixed	Number right scoring	70	24.36	5.636			
	Corrected scoring method	70	24.09	6.949			
	Total	140	23.15	5.790			

P>0.05 (Result not Significant)

multiple choice agricultural science test scores. This might be due to the corrected scoring method that the total items scored right by the students would be deducted from the items scored wrong by that students all over the number of options minus one. Steven and Rachel (2009) disagreed with this; They argued that the basic assumption is incorrect, and the formula does not truly correct item guessing.

According to him, one cannot divide items where he may have much knowledge. Another study by Louis et al. (2007) observed that, in practice, when the formula is applied a considered number of low ability students tend to emerge with negative corrected scores. Odeyemi (2003) concluded that number right scoring method robs the testees of some points and even gives false assessment of students at some point in time.

Also, the findings of this study showed that number right scoring method and corrected method had a significant different in the performance of students in multiple choice agricultural science test scores. Singh (2010) found that the effect of using scoring method is more or less test specific.

### CONCLUSION

There was no significant difference between the academic performance of students whose scripts were marked with corrected scoring method in multiple choice agricultural science test scores. Number right scoring method was found to be the best scoring method that could favour the students in multiple choice agricultural science test scores, because it is very easy to score large number of students' scripts.

### RECOMMENDATIONS

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

1. Number right scoring method should continue to be used being a common method used in schools by the teachers and it is very easy for teachers to score the students scripts
2. Examination bodies like National Teachers Institute (NTI), Joint Admission and Matriculation Board (JAMB) and other organisations could use the number right scoring method for promotions and recruitments.
3. The method could be used in scoring Junior Secondary School (JSS) examination.

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