

## ASSESSMENT OF EFFECT OF INNOVATIVE EDUCATIONAL TECHNOLOGY TEST ON UNDERGRADUATE STUDENTS

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### Abstract

Determining continuous assessment test practice that is cost effective in terms of administration and expenses; determining the gender difference in the mean score performances of students on Innovative Educational Technology Test (IETT) were among the objectives of the study. A pre-experimental design was adopted for the study. The population of the study was made up of 280 final year students from Faculty of Technology Education, Abubakar Tafawa Balewa University Bauchi. Proportional Stratified random sampling technique was used to select 188 students (83 males and 15 females from department of Vocational and Technology Education while 53 males and 37 females were from department of Science Education). Teacher- made test and IETT were developed, validated and used for the data collection. Inter-rater reliability (Kappa) coefficient of 0.81 was established. The data was analyzed using descriptive statistics, Independent t-test and Pearson correlation. Hypotheses were tested at  $\alpha = 0.05$  level of significant. Findings from the study showed that the production cost of the IETT was N1.20 per student as against the teacher- made test which stood at N18.80; There is significant ( $t = -2.540, p = 0.012$  at  $\alpha = 0.05$ ) difference in mean score performance between male and female students on TCAT. Similar study and workshops/seminars on the new strategy were among the recommendations made.

**Keywords:** Teacher-made test, Innovative Educational Technology Test, & Undergraduate students.

### Introduction

Innovation in educational practices enhances betterment in achievement of educational goals/policies of any nation. A nation that remains dogma on its educational goals/policies such nation could experience setback on its educational standard. The role as of innovation in assessment practices could not be overemphasized. Anikweze (2015) urged teachers to be innovative to improve assessment. However, lack of qualified personnel is one of the main factors of hampering innovation (Ojerinde, 2015).

Educational Technology is among the core courses offered by undergraduate students in the faculty of education. It is the course that seeks to teach and expose students to uses of Audio

and Non -Audio teaching materials that are in line with the current integration of Information Technology in teaching.

Continuous Assessment was introduced in Nigerian education system. Odinko (2014) defined Continuous Assessment (C.A) as “A process of periodic collection of information on three domains of learning (Cognitive, Affective and Psychomotor) throughout a course/ programme of study with the purpose of determining each learner’s progress towards goals of attainment”. CA is usually administered twice in the form of assignment and a test for any given course of study in a semester.

The idea of C.A is to monitor learning progress on both part of the instructor and learners through providing suitable opportunities in the classroom to students to demonstrate their understanding of what they learnt so that proper feedback can be provided (Asuru and Ogidi, 2014). Nicholas and Onuka (2015) observed that a lack of appreciation still exists in many quarters about the worth and potential value of the data that assessment can provide. Indeed, results from CA test scores are no longer reflection of what learners could do. Some instructors resolved in not giving assignment to their students for lack of its credibility (Copy and Paste) and those proportions of the instructors who administer written test is not without the problems of mal practice. In fact, it was not a surprising for a student with higher CA score to fail examination. Although there is no alternative to dodging the CA test but there is need to look for alternative through innovation for administering CA test that is valid and reliable especially in era of rapid technological advancement in education, couple with over-population of students in universities and other tertiary institutions like colleges of education and polytechnics new strategies on C.A practices are needed. However, could the Innovative Educational Technology Test (IETT) overcome the problems associated with the Traditional Continuous Assessment Test (TCAT) practices?

The study seeks to assess the effect of IETT on undergraduate students’ performance. Specifically the study determined the:

- i. CA test that is cost effective in terms of administration and expenses.
- ii. Difference in mean scores performance between male and female students on TCAT.
- iii. Difference in mean scores performance between male and female students on IETT.
- iv. Correlation of scores between the TCAT and IETT.

## Hypotheses

The following Null hypotheses were tested at  $\alpha = 0.05$  level of significance:

**H<sub>01</sub>:** There is no significance difference between the mean score of male and female students on TCAT.

**H<sub>02</sub>:** There is no significance difference between the mean score of male and female students on IETT.

**H<sub>03</sub>:** There is no significant correlation between the score of TCAT and IETT.

## Methodology

A pre- experimental one group was the design adopted for the study. The population of the study was made up of 280 undergraduate 300 level students from the Faculty of Technology Education. Of these populations, 129 students were from the department of Science (85 males and 44 females) while 151 students were from the department of Vocational and Technology Education (133 males and 18 females). One common characteristic of the population of the study is the compulsory courses. Educational Technology is one of such compulsory courses on which the study was based.

A sample of 136 males and 52 females were drawn at random based on stratified proportional random sampling technique.

**Table 1 showing the sample population based on departments**

Department	Male	Female	Total
Science Education	53	37	90
Vocational & Technology Education	83	15	98
Total	136	52	188

A criterion – reference test design was used to develop TCAT and IETT that are equivalent in content coverage, number of items but differs in instruction and assumption were used for data collection. TCAT was developed by the course lecturer comprising of 7 items (developed from the topic covered) in which students were instructed to answer any one question within 30 minutes. IETT was developed by the student through the following guide strategies.

- i. Blank A4 sheets were given to each student, and they were instructed to write any seven questions from the topics as covered in the course Educational Technology.
- ii. The students were instructed to answer item 5 on the question set within 30 minutes.

The assumptions of the two tests (students have registered the course and have been attending lectures) are the same but the IETT has the following additional assumption:

- i. Determining justification of student attendance to lectures.
- ii. Inculcate the self-reliance and ability for student to demonstrate skills in setting questions.

The IETT test was initially pilot-tested with a sample of 30 students from department of science education and department of vocational & technology education. Two lecturers marked the scripts. Inter- rater reliability (kappa) coefficient of 0.86 was established. The data was analysed using mean standard deviation while the hypotheses were tested using t-test and Pearson correlation coefficient. Both tests were marked over 15. The marking scheme for the IETT was designed to have the following format:

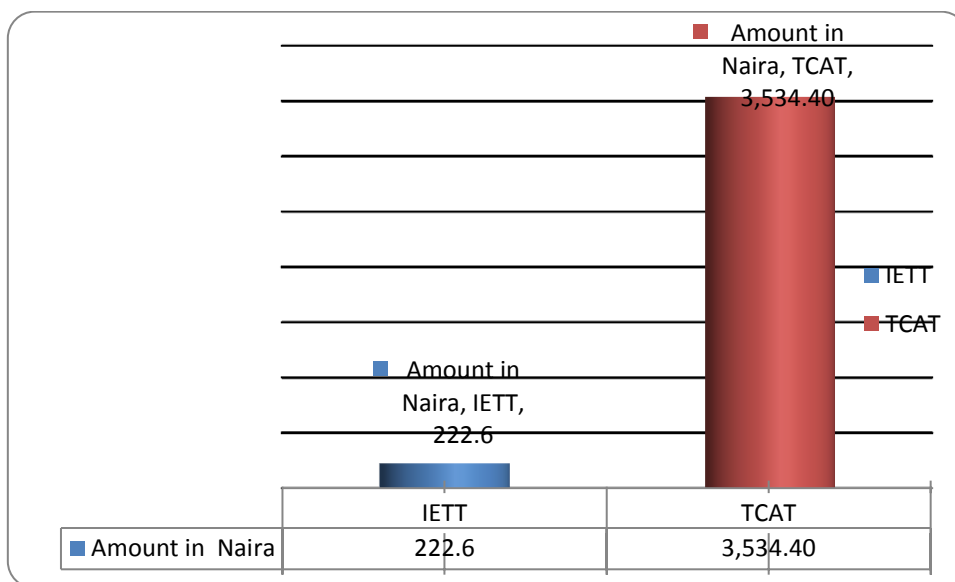
- i. Setting up 7 questions correctly with one question from each topic *attracts 7 marks.*
  - ii. Answering question 5 as demanded *attracts 8 marks.*
- Grand total =15 marks*

While the marking scheme for the TCAT followed the usual teacher made test marking scheme format.

### Presentation of Results

Results obtained from the data were tabulated and hypotheses tested were presented below. Statistical Package for the Social Sciences (SPSS) was used to test the hypotheses.

**Figure1. Production cost in Naira between TCAT and IETT**



The Figure 1 above shows the production cost between TCAT as compared with IETT in Nigerian Naira.

From Figure 1 above, the production cost of the IETT was N225.60 at an average rate of N1.20 per student as against the TCAT which stood at N3, 534.40 at an average of N18.80 per student.

**Table 2a. Gender differences on Mean and Standard Deviation scores of TCAT**

Gender	N	Mean	SD	Standard Error
TCAT Male	136	6.80	3.278	.281
Female	52	8.12	2.881	.400

**Table 2b. Independent Sample**

t- test for equality of means			
t	df	Sig(2-tailed)test	Mean difference
-2.540	186	.012	-1.314

Result from Tables 2a revealed the summary of mean and standard deviation in gender of the TCAT .While the result from Table 2b is the independent t-test computed in determining gender differences in mean scores of the TCAT.

**Table 3a. Gender differences on Mean and Standard Deviation scores of IETT**

Gender	N	Mean	SD	Standard Error
IETT Male	136	14.16	2.261	.194
Female	52	13.83	2.713	.376

**Table 3b. Independent Sample Test**

t- test for equality of means			
t	df	Sig(2-tailed)test	Mean difference
.858	186	.396	.335

Tables 3a and 3b above, shows the gender difference in mean and standard deviation and the independent t-test computed on IETT respectively.

**Table 4a. Summary of Mean and Standard Deviation of TCAT and IETT**

Score	N	Mean	Std. Deviation
TCAT	188	14.07	2.392
ICAT	188	7.16	3.219

**Table 4b. Correlation**

	IETT	TCAT
IETT Pearson Correlation	1	.137
Sig(2 –tailed)		.60
N	188	188
TCAT Pearson Correlation	.137	1
Sig(2 –tailed)	.060	
N	188	188

Tables 4a and 4b shows the tabulated results obtained on determining relationship between TCAT and IETT. Result on Table 4a, revealed *mean* and *standard deviation* of 14.07, and 2.39 and 7.16 and 3.22 for TCAT and ICAT respectively. While Table 4b, shows the result obtained on testing  $H_03$  ( $r = .137, \rho = .060$  at  $\alpha = 0.05$  level of significance).

## Findings

- IETT was cost effective N1.20 per student as against the TCAT which stood at N18.80 per student.
- There is significant difference in mean score performance between male and female students on TCAT.
- There is no significant difference in the mean score performance between male and female students on IETT.
- The two scores obtained by the students on TCAT and IETT were independent of each other.

## Discussion

In discussing the result from the study, limitation such as the scope on the application of IETT to non-numerical courses must be acknowledged.

To achieve objective 1 from the study, the result shows that the production cost of the IETT was N1.20 as against the TCAT which stood at N18.80 per student. The administration of IETT was also easier. Finding from this revealed that IETT was cost effective as compared with TCAT. It was observed from IETT scripts marked, malpractice associated with TCAT was completely eradicated. This finding is in agreement with Yusuf (2016) who observed that innovation in test practices were free of all forms of malpractice, marked scripts of the experimental group. The IETT scripts content were characterized by various demonstrative abilities of interest and attitude on the course content. The following were also observed to be associated with IETT -:

- It enhances positive effects on diagnostic and formative evaluation.
- It assists in evaluating both instructor and students' level of attendance to lectures.
- The marking is tedious and demanding however, it encourages the instructor to be updated on the course content.

Tables 2a and 2b, shows the result of  $H_{01}$  tested at  $\alpha = 0.05$  level of significance. From the result on Table 2a, *Mean* = 6.80, *Standard deviation* = 3.28 and *Mean* = 8.12, *Standard deviation* = 2.88 were obtained for male and female students on TCAT respectively. However, the difference in mean score (Table 2b) was statistically significant at  $t(186) = -2.540, \rho < 0.05$  level of significance, so the  $H_{01}$  was rejected. Finding from this shows that there is statistically significant difference in mean score performance between male and female students on TCAT.

The result of the independent t- test computed on testing **H<sub>02</sub>** was tabulated on Tables 3a and 3b. From the result on Table 3a, *Mean* = 14.16, *Standard deviation* =2.26 and *Mean* = 13.83 *Standard deviation* =2.71 were obtained. However, result on Table 3b shows that the difference in mean score performance between male and female students on IETT was not statistically significant at  $t(186) = .858, \rho = .396$ , the **H<sub>02</sub>** was not rejected for  $\rho > 0.05$  level of significance. Finding from this, revealed that there is no significant difference in the mean score performance between male and female students on IETT. This finding is in support of Yusuf (2016) who observed no significant difference between the experimental and control groups on the usage of nominal data (innovative) educational statistics test.

The result obtained from testing **H<sub>03</sub>** was shown on Tables 4a and 4b. Although the result from Table 4a, shows the *Mean* = 14.07, *Standard deviation* =2.39 and *Mean* = 7.16 *Standard deviation* =3.22 for TCAT and IETT respectively. However, result from Table 4b revealed no significant correlation ( $r = .357, \rho = 0.60$ ) between TCAT and IETT at  $\alpha = 0.05$  level of significance. Thus, the **H<sub>03</sub>** was not rejected for  $\rho > 0.05$ . Finding from this, revealed that the two scores obtained by the students on TCAT and IETT were independent of each other.

## Recommendations

The following recommendations were made:-

- Lecturers with at least 3 years lecturing experience to put IETT on trial.
- Need for further study on the verification of the findings associated with IETT.
- Workshops /seminars on the IETT.

## Conclusion

The study assessed the effect of innovative educational technology test on undergraduate students' performance. The Innovative continuous assessment test IETT was for the betterment of educational assessment practices that are free of continuous assessment malpractice, cost effective and easy for administration. Although the IETT was found to be cost effective in terms of expenses, and easier in administration with minimum malpractice rate. However, there is need to put in the method into practice in other courses. Innovation in continuous assessment test practices could be merely a slogan if the innovative ideas have not been put into practice. It is through practice that weaknesses associated with the innovative ideas could emerge and remedy found.

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