Impact Of Objective Test Formats on Test Reliability Coefficients and Academic Performance in Graphic Related Economic Concepts Among Students in Calabar Metropolis, Cross River State, Nigeria

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Abstract- *This study examined the impact of objective test formats on test reliability coefficients and academic performance in graphic-related economic concepts among senior secondary school students in Calabar Metropolis, Cross River State. Two research questions and hypotheses were stated to be tested. Ex-post facto design was adopted for the study with proportionate stratified random sampling technique to collect a sample of 370 respondents randomly selected from public schools in Calabar Metropolis, Cross River State. Three instruments of multiple-choice test format, true/false test format and matching test format were used for data collection and were developed using a test blue print. Data collected were subjected to analysis using One-Way Analysis of Variance Analysis (ANOVA) Repeated Measure Statistical Techniques. Results showed that there was no significant influence of objective test format on students' academic performance in graphic-related economic concepts test. Also, there was no significant influence of influence of gender and objective test format on academic performance of students in graphic-related economic concepts test. Study concluded that objective test format and gender differences do not have any significant influence on the performance of students. The format of objective test (multiple-choice, matching and true-false) can be used to assess students' performance as all three-format yielded similar reliability coefficient and performance between male and female students. The study recommends among others that classroom teachers should be trained through regular workshops in proper test development and construction skills.*

Index Terms- Objective Test Format, Test Reliability Coefficients, Academic Performance Graphic Related Economic Concepts, Students

I. INTRODUCTION

Assessment remains a critical component of the teaching-learning process, providing feedback to students and teachers, informing instructional decisions, and determining educational outcomes. In educational measurement, Sunday (2025) states that the test format plays a crucial role in determining the reliability and validity of test scores. Objective tests such as multiple-choice, true/false, and matching items are widely recognized for their high objectivity, consistency, and scoring efficiency. According to Fagbenro and Ibrahim (2024), a test is a tool used to establish a tight relationship between what is taught in school, what is assessed, how it is assessed and who does the assessment. All these are summarized in the reliability and validity of a test. The exposure of students early enough to the techniques of answering standardized test through internal assessment in schools is absent in schools. The unfortunate scenario today is that in many testing situations, much of these desired dependability and consistency are often swayed by subjectivity in testing (Zakka & Okoye, 2023; Adedoyin & Soykan, 2023).

Rasooli et al (2022) observed that the measurement carried out in our school system today does not meet the requirements of objectivity. In that sense, the score an individual gets from a test depends on the quality of the test taken. For example, an individual is a "star" if the test is quite easy and he is a "dummy" if the test is hard. It is saddened at present that secondary schools are not measuring up to the standard expected of them (Okpala et al, 2024).

In economics education, particularly in graphic-related concepts such as demand and supply curves, elasticity graphs, cost and revenue curves, and market equilibrium analysis, assessment accuracy is vital. These concepts require both conceptual understanding and analytical skills, making the reliability of test instruments especially critical. Crocker and Algina (2023) views reliability to be the consistency, stability, and dependability of test scores across repeated measurements. Studies such as Darling-Hammond et al (2022), Zakka and Okoye (2023), Fagbenro and Ibrahim (2024) indicates that objective test formats tend to yield higher reliability coefficients compared to subjective formats due to reduced scorer bias and standardized scoring procedures. Furthermore, Cronbach's alpha and Kuder–Richardson formulas are widely accepted indices for estimating internal consistency reliability in objective testing (Cronbach, 1951; Eneja and Ikeh, 2016; Gbore, 2016; Akamigbo, 2014).

Integrating graphics-related concepts in economics has become increasingly crucial for effectively understanding and visualizing economic principles (Biehler & Snowman, 1997). However, students in Nigeria, particularly in Cross River State, have consistently struggled to grasp these concepts, leading to poor academic achievement (Afolabi, 2017; Adeyemi, 2018). Again, there has been great concern by the government and individuals over the continuous poor performance of secondary school students in public examinations in Nigeria. Academic performance is a yardstick for testing the educational quality of a nation (Nwokocha & Amadike, 2012) and thus the need to maintain high performance in internal and mostly external examinations is vital (Abubakar & Oguguo, 2011; Onuka & Durowoju, 2011). Measurement of performance of students through public examination conducted by West African Examination Council (WAEC) or National Examination Council (NECO) using standardized test instrument is one of the strongest and enjoys a lot of public confidence by all. For years now, reports on pages of newspapers like the punch newspaper (Sunday, 2025) and research findings by Adeyemi (2011), Asikhai (2010) and Ogunbanwo (2014) have all shown the extent of poor performance of students in public examinations. The continuous decline in students' performance in public examinations yearly is not only frustrating to the students and the parents, but also affects the society.

The economics teachers need to bridge the gap between teaching and assessment so as to improve students' achievement in economics. This can be done by utilizing instructional techniques where students are allowed to contribute to knowledge construction and make decisions about the learning outcome instead of being just passive learners (Ugondulunwa & Wakjissa, 2015). Aina and Oyetunde (2023) evidence suggests that objective tests enhance academic performance by minimizing ambiguity, reducing test anxiety, and promoting focused learning. However, limited studies have explored the interaction between objective test format, test reliability coefficients, and academic performance in graphic-related economic concepts, particularly in the Nigerian context. More so, in a given class, the students having being taught with standard of instructions and set of objectives, yet at the end of the day under same test environment, same student mode, when assessed with different forms of objective test: - multiple-choice (MC), true-false (TF), matching (M) or fill-in (F) may give a different performance by the student for the various forms. Why does this happen? Alordiah et al (2015) observed that most teachers do not know the required procedures for effective test construction by ensuring that test instrument follow test blue print and are tested for reliability before each administration, the merits and demerits of test formats and when to use a given test format despite psychometrician efforts in recent times to improve the quality of measuring instruments in schools through reliability and validity.

Teachers construct and administer tests to their students with little or no concern for the quality the test procedure should possess. According to Agu et al (2013), most classroom-based tests in Nigeria lack validity and reliability as most teachers have little or no required knowledge of principles of assessment. Most of the teacher-made objective tests have been criticized by many as being subjective as it measures one topic only as against several topics taught by the teacher and not properly constructed to meet the requirements of an objective measurement (Brookhart & Nitko, 2023). Thus, most teacher-made

objective tests lack the two most basic psychometric properties of a good test which are validity and reliability. Reliability is a measure of how stable, dependable, trustworthy and consistent a test is in measuring the same thing each time (Nenty & Umoinyang, 2004). It entails the consistency of individual scores from one administration of an instrument to another and from one item to another and a measure of the extent to which an examinee's score reflects random measurement error (World Bank, 2023; UNESCO, 2024; Sunday et al, 2025).

The selection of item types and test formats should be based on the kind of skills to be measured and not on some personal like or dislike for a particular item format. A close look at test and terminal question papers of students in secondary schools over the years in Cross River State and the increased students' population per class reveals that most teachers use only multiple-choice format of objective test in assessing students as against the inter-change of the different objective formats without proper investigation to the effectiveness, consistency and relevance of the test in line with stated objectives drawn from the curriculum (Sunday, 2025). Others simply repeat, reshuffle or modify objective test items in test papers of previous academic years to form a new test paper for current students. Nenty and Fetogang (2014) discovered in their study that teachers use previous examinations to prepare classroom and school test which is an indication that teachers do not have understanding of how to develop a reliable and valid test.

According to Black and Wiliam (2022), most teachers also prefer to use sampled test items provided by textbooks publishers in their textbooks to assess students. All these unprofessional practices either inflate or deflate students' scores, thus defeating the purpose of testing and also make reliability, validity and efficiency of such test insignificant as compared with standardized objective test from West African Examination Council (WAEC), National Examination Council (NECO) and Joint Admission Matriculation Board (JAMB). The students most times tend to be confused when answering standardized objective test items not because they were not taught, but because they were not exposed early enough to a good test in school. It is common to discover that teachers ask test questions without developing a test blue print to balance content with behavioural objectives. Most students in the classroom are faced with objective test items that have unclear directions or flawed test items (Alonge, 2008) which affect their performance. Bitrus et al (2016) and Titus et al (2016) averred that some people have attributed the low standard of education to student gender and the type of test formats used by teachers in schools without knowing that proper objective test items written and administered to students offers remedy to shortfalls of essay test items and allow a large number of test items to be constructed so that the content of the course can be effectively sampled.

Gender is the difference in sex (either male or female) and how this quality affects their dispositions and perceptions toward academic activities. Gender has remained an issue in secondary and a source of disagreement among researchers. In contrast, some studies show evidence of males' superiority over females in achievement in a subject. There are always significant differences between males and females achievement in Economics. Ali and Durkwa (2016) found that females showed superiority in measures of verbal fluency, and males showed superiority in mathematical and spatial abilities. These inconsistencies create and sustain curiosity; hence, there is a need to investigate whether leaners exposed to different objective test formats will achieve differently based on gender.

This paper is therefore, presuming that objective test format (matching, true/false and multiple type option) when not well constructed and used in assessment of students could be responsible for the poor performance in Graphic Related Economic Concept and it is on this backdrop that this paper is made to find out the influence of objective test format, rest reliability on academic performance in Graphic Related Economic Concept.

Theoretical Framework
Objective linear model was propounded by Ralph Tyler in 1949 and his main focus is on the specification of objectives and measurement of outcomes especially through evaluation model. According to Tyler, the objectives of the curriculum

drawn in a country are derived from studies of both the learner and the learner's society in collaboration with specialists from the different subject areas. From here, tentative objectives are examined in line with learning theories and the philosophy of education adopted by the society to ensure their validity and utility. This gives rise to the formation and adoption of the final objectives for a given subject after whom learning experiences are selected and evaluation process carried out. Tyler's objective linear model insists that any educational programme should be studied systematically and intelligently through a determination of the educational objectives. At the end of the educational programme, assessment and evaluation to be done must be based on and judged against the standard set by the statement of the objectives. Structurally, the model is known as objective-oriented and outlines the following approaches for evaluation: (a) formulation of a statement of educational objectives, (b) classifying these objectives into major types, (c) defining and refining each of these types of objectives in terms of behaviour, (d) identifying situations in which students can be expected to display these types of behaviour, (e) selecting and trying promising methods of obtaining evidence regarding each type of objective, (f) selecting on the basis of preliminary trails and the more promising appraisal methods for further development and improvement, and (g) devising means for interpreting and using the results (Tyler, 1942, pp498-500).

The selection of goals of any educational programme is based on analysis of three sources: the student, the society and the subject matter and two goal screens: psychology of learning and philosophy of education (Tyler & Oliva, 2022). The goals are then transferred into measurement objectives; such that at the end of the educational programme, learners are assessed to see the degree to which the former established goals were achieved. Tyler stated that unattained goals show inadequacies in the instructional programme, thus the need to recycle the unattained goals or expunge and replace new goals, which are commensurate with the educational system.

The advantage of this model is that it is used to ascertain how much gain are made in executing any programme and thereafter reappraise those non-

realized objectives, restructure them and later re-evaluate them to determine success. However, the model has been criticized for lack of recognition of antecedent and process variables as it emphasizes on value judgment which leads to superficial and incomplete assessment of any programme. Also, appearing as a chain of one-way causal relationship that neglects any interaction among the various components and does not show clearly where the course content of a subject and method of instruction are to fit into the entire process except by assumption. The implication of the model to this study is that:- the model provides a blue-print and a fixed guide for complete learning and assessment process. The test items developed for the study are in line with stated objectives of graph related topics in Economics for senior secondary school students as contained in the Economics curriculum.

Statement of the Problem

The rate at which students are failing in major subjects in secondary school today is alarming. Over the years, statistics and observations have shown that students have not performed well in Economics. This state of affairs has troubled the hearts of parents, administrators, government, teachers and even students themselves. This is because outside its requirement for admission into tertiary institutions for those in social sciences, it involves knowledge and skills that are needed for daily living (Orokpo & Sunday, 2023). Efforts made by the government and non-governmental organizations (NGOs) and even researchers to curb this problem seem not to be meaningful or effecting desired changes in the performance status of the students. For example, Orokpo et al (2024) states that most NGOs, school administrators have tried to organize inter quiz competitions in Economics with tangible prices for schools and individual that wins, school Economics teachers are given special allowances, workshops and seminars are often organized to boast teacher's knowledge and commitment to work.

Persistent poor performance in economics, especially in graphic-related topics, has been observed among secondary school students (Sunday & Neji, 2023). Many students struggle with interpreting graphs and applying economic principles accurately. One possible contributing factor is the test format used in

assessment. Subjective tests often introduce scorer bias and inconsistency, which can reduce reliability and distort true academic performance. Although objective test formats are known to enhance scoring objectivity, empirical evidence regarding their influence on test reliability coefficients and academic performance in economics graphical concepts remains scarce. This study therefore investigates the impact of objective test formats on both reliability coefficients and students' academic achievement in graphic-related economic concepts.

Study objective

The study was to investigate the influence of objective test format on test reliability coefficients and academic performance in graphic-related economic concepts. Specifically, the study was to examine whether:

i) Objective test formats (multiple-choice, matching and true-false) differ in test reliability coefficient in graphic-related economic concepts.

ii) Objective test formats and gender influences students' performance in graphic-related economic concepts.

Research Questions

The following research questions were posed to guide the study:

i) To what extent is the reliability coefficient different across objective test formats?

ii) To what extent does objective test formats and gender influence students' performance in graphic-related economic concepts?

Research Hypotheses

The following hypotheses were posed to guide the study.

1) There is no significant influence of objective test formats (multiple-choice, matching and true-false) on students' performance in graphic-related economic concepts.

2) Objective test formats and gender do not have a significant influence on students' performance in graphic-related economic concepts.

II. METHODOLOGY

Research design

The research design used for this study is the ex-post facto research design. The design is appropriate since the research is establishing the influence of an already existing trait (test format) on the reliability of the test and students' performance and inferences concerning the relationship between the independent and dependent variables can be made without direct intervention (Sunday & Etuk, 2024). This research design tries to link some already existing variables as causative agents since it was discovered by the researcher that the respondents were already assigned into the different levels of the variables for which influences are being investigated. The design is suitable for the study as the researcher wants to find out the possible reasons for any observed differences on the dependent variable and if objective test formats and test reliability could influence students' performance in economics examination.

Population/Sample of the study

The population of the study consists of all Senior Secondary two (SS II) students in all the 81 public secondary schools in Calabar Metropolis, Cross River State, Nigeria. Total population of SS II students is 10,580, comprising 5,452 males and 5,128 females. The stratified random sampling method was utilized for this study due to the heterogeneous nature of the population. In the same vein, in the selected schools, to draw the sample, the researcher was guided by the formula postulated by Krijcie and Morgan (1970) that identifies a sample size of 370 for a population of 10,000 to 15,000. This gives 3.497% of the population and the researcher randomly selected 3.497% of the students in each sampled school in the LGA. In the selected schools, intact classes were used for the study. Therefore, a total of 370 SSII Economics students from public secondary schools was used as the sample for the study from the various populations of the LGA.

Instrumentation

The instrument for data collection is Economics Achievement Test (EAT) constructed in three different formats namely: multiple-choice test, matching test and true-false test. All three forms are one and the same test measuring the same thing. Each

of the test comprised of 30 items covering SSII scheme of work namely: Demand Curve, Supply Curve, Market Equilibrium, Production Possibility Curve, and Cost Curve. Four cognitive levels: knowledge, comprehension, application and analysis were used for the study. Each correct response was scored one mark and incorrect response was zero mark. The scoring guide that contained all answers to the three test formats was developed. The development of items was based on the table of specification presented in Table 1. The table of specification (table 1) in its final form was used to

determine the number of items per content namely: Demand Curve (5 items, 15%), Supply Curve (4 items, 15 %), Market equilibrium (8 items, 25%), Production possibility curve (7 items, 25%) and Cost curve (6 items, 20%). The Economics Achievement Test (EAT) was validated by experts in measurement and evaluation. The instrument achieved a Cronbach's alpha of 0.82 of internal consistency in reliability test, underscoring its reliability for the study.

TABLE 1: TABLE OF SPECIFICATION FOR THE OBJECTIVE TEST ITEMS

CONTENT	KNOWLEDGE (25%)	BEHAVIOURAL OBJECTIVES COMPREHENSION (25%)	APPLICATION (30%)	ANALYSIS (20%)	TOTAL (100%)
Demand Curve (15%)	1	1	2	1	5
Supply Curve (15%)	1	1	1	1	4
Market Equilibrium (25%)	2	2	2	2	8
Production Possibility Curve (25%)	2	2	2	1	7
Cost Curve (20%)	2	1	2	1	6
Total (100%)	8	7	9	6	30

III.   RESULTS

Research question one
To what extent is the reliability coefficient different across objective test formats in graphic-related economic concepts? In answering the research question Cronbach Alpha reliability coefficient was computed for 370 sampled students in the three formats viz: multiple-choice, matching and true-false.

TABLE 2: Summary of Cronbach Alpha Reliability Coefficient for three Objective Test Formats

Variable	N	$\overline{X}$	S.D	α
Multiple-choice	370	14.39	5.28	.817
Matching	370	13.77	6.84	.791
True-false	370	14.85	2.88	.396

Table 2 reveals that multiple-choice test had a mean of 14.39 with a standard deviation of 5.28 and reliability coefficient of .817, matching option test had a mean value of 13.77, standard deviation of 6.84 and reliability coefficient of .791 while, true/false test had a mean of 14.85, standard deviation of 2.88 and reliability coefficient of .396. From the table, the reliability coefficient is not different between multiple-choice test and matching test. Only true-false test has a reliability coefficient that is too low to be compared with others.

Multiple reliability coefficients thereby are not different. This is so because students are familiar with these test forms as it is used by most subject

teachers especially in English Language. True-false test has the lowest reliability coefficient even when it was presented to the students at the third week and the reason is that students and teachers are not familiar with the test format and as such expressed confusion by asking for clarity in the test items. The confusion resulted in the poor performance of students in the format.

Research question two
To what extent does objective test formats and gender influence students' performance in graphic-related economic concepts?

TABLE 3: Analysis of the influence of gender and objective test format on academic performance in graphic-related economic concepts

Variables	Gender	N	$\overline{X}$	S.D
Matching option	Males	191	14.06	6.74
	Females	179	13.35	6.53
	Total	370	13.68	6.62
True/false	Males	191	14.59	2.78
	Females	179	15.07	3.02
	Total	370	14.84	2.91
Multiple option	Males	191	14.84	5.06
	Females	179	14.15	5.10
	Total	370	14.31	5.08

Table 3 revealed the analysis of the influence of objective test formats and gender on academic achievement of students in graphic-related economic concepts. The results showed that males performed higher than females in matching option objective test format (Male $\overline{X}$ = 14.06; Female $\overline{X}$ = 13.35). Also, males performed higher in multiple choice objective test than female (Male $\overline{X}$= 14.84; Female $\overline{X}$= 14.15) respectively. However, females performed higher than male students in true/false objective test format (Female $\overline{X}$= 15.07; Male= 14.59).

Test of hypotheses
Hypothesis one
There is no significant influence of objective test formats (multiple-choice, matching and true-false) on students' performance in graphic-related economic concepts. The independent variable in this hypothesis is objective test format considered from three dimensions of multiple-choice test, matching option test and true-false test, while academic performance is the dependent variable. To test this hypothesis, the students took the three set of tests and each student had three set of scores.

TABLE 4: One-Way Analysis of Variance (ANOVA) of Repeated Measure Analysis of the influence of Objective Test Format on Academic Performance of students in graphic-related economic concepts

Objective test format	N	$\overline{X}$	S.D
Multiple option	370	14.39	5.28
Matching	370	13.77	6.84
Truer-false	370	14.85	2.88

Mauchly's test of sphericity

Within subject effect	Mauchly's w	Approx.	Chi square	df	p-val
Objective test formats		901	23.33	2	000

Source of variation		Type 111 Sum of squares	df	MS	F.	P.val.
Intercept Objective:	sphericity assumed	137900.676	1	137900.679	5246.592	.000
		153.354	2	76.67	2.94	.054
	Greenhouse-Geisser	153.354	1.842	84.26	2.94	.059
	Huynh- Feldt	153.354	1.834	83.61	2.94	.058
	Lower bound	153.354	1.000	153.354	2.94	.087
Error :	sphericity assumed	11714.64	450	26.035		
	Greenhouse-Geisser	11714.64	409.489	28.60		
	Huynh- Feldt	11714.641	412.642	28.38		

Lower bound	11714.641	225.00	52.06

The concern was to compare students' performance in graphic-related economic concepts on the basis of their performance in the three different formats. One way analysis of variance (ANOVA) with repeated measures of within subject was used because of its robustness in handling all test statistics and all sampled students participated in the three tests. Table 4 shows the result of the analysis. The assumption of sphericity which means that the level of dependence or relationship between groups that participate in an experiment is equal was assessed using the Mauchly's test of sphericity statistics and the result on table 4 showed that $\overline{X}^2$ (2) =23.33, p=.000 is significant. This implies that sphericity assumption was violated as the p-value of .000 is less than the criterion value of .05 and that means that the variances of the differences in performance between the formats were significantly different and not equal. This means a loss of power leading to an increase probability of type two error and inability to compare the F-ratio test statistics to tabulated values of the f-distribution. In other to test for the F-value when sphericity is violated, the Greenhouse-Geisser correction was used and the result for objective test and performance showed (F (1.842, 409.489) = 2.94, p = .059, p>.05). This implies that the null hypothesis is accepted, which states that there is no significant influence of objective test formats on students' performance in graphic-related economic concepts. This implies that students' performance in a given test is not influenced by the test format presented to them for an objective test.

Hypothesis two

There is no significant influence of gender and objective test format on academic performance of students in graphic-related economic concepts. The independent variable in this hypothesis is gender and objective test format considered from three dimensions of multiple-choice test, matching option test and true-false test, while academic performance is the dependent variable. To test this hypothesis, both male and female students took the three set of tests and each student had three set of scores.

TABLE 5: Two-way analysis of variance (ANOVA) repeated measure analysis of the influence of gender and objective test format on academic performance in graphic-related economic concepts

Variables	Sex	N	$\overline{X}$	S.D
Matching option	Males	191	14.06	6.74
	Females	179	13.35	6.53
	Total	370	13.68	6.62
True/false	Males	191	14.59	2.78
	Females	179	15.07	3.02
	Total	370	14.84	2.91
Multiple option	Males	191	14.84	5.06
	Females	179	14.15	5.10
	Total	370	14.31	5.08

Mauchly's test of sphericity

Within subject effect	Mauchly's w	Approx.	Chi square	df	p-val
Objective test formats	.900		23.51	2	000

Source of variation		Type 111 Sum of squares	df	MS	F.	P.val.
Intercept	sphericity assumed	137900.676	1	137900.679	5246.592	.000
Objective:	sphericity assumed	143.309	2	76.67	2.750	.065
	Greenhouse-Geisser	143.309	1.818	78.82	2.750	.070

	Huynh- Feldt	143.309	1.840	77.87	2.750	.070
	Lower bound	143.309	1.000	143.309	2.750	.090
Objectives * Sex	sphericity assumed	42.028	2	21.014	.807	
	Greenhouse-Geisser	42.028	1.818	23.117	.807	
	Huynh- Feldt	42.028	1.840	22.83	.807	
	Lower bound	42.028	1.000	42.028	.807	
Error:	sphericity assumed	11762.618	448	26.055		
	Greenhouse-Geisser	11762.618	407.246	28.662		
	Huynh- Feldt	11762.618	412.228	28.316		
	Lower bound	11762.618	554.00	52.110		

The independent variables in this hypothesis are gender (male and female) and objective test format categorized as multiple choice test, matching test and true/false test. The dependent variable is academic performance in Economics. To test this hypothesis, two-way analysis of variance (ANOVA) repeated measure was used and the result is explained in Table 5.

The assumption of sphericity was assessed using the Mauchly's test statistics and the result showed that $\bar{X}^2$ (2) =23.51, p=.000 which implies that this assumption was violated. Furthermore, the Greenhouse- Geisser correction which is used when the assumption for sphericity is violated showed that (F (1.810, 407.246) =2.750, p = .07, p>.05). This implies that the null hypothesis is accepted and that means that gender and objective test format does not significantly influence students' performance in graphic-related economic concepts.

IV. DISCUSSION OF FINDINGS

The finding of this study showed that the reliability coefficients of objective test formats are not different except for the true-false test that had the least reliability coefficient. This could be so because of the fact that true/false format is rarely used in assessing students, hence the poor performance which affected its reliability. One possible explanation for no difference in the reliability coefficient is because all three formats are the same and are measuring the same trait from the same respondents. This result is supported by the findings of Adebule (2009) in his study on, "reliability and levels of difficulty of objective test items in Mathematics achievement test" in five Local Government Areas of Akure, Ondo State. The analysis revealed the t-calculated value of 0.524 and a critical t-value of 1.980 showing that p> 0.05, which implies that, the null hypothesis was accepted. Thus, there is no significant difference between the reliability coefficients of multiple-choice test format and true-false test format. The findings by Alonge (2008) and Adebule (2004) that discovered that there was no significant difference between the reliability coefficients of a 3-alternative MC and 4-alternative MC tests also supports the result of the analysis.

Results obtained by Frisbie and Ebel (2011) also support the result of the analysis. Frisbie and Ebel (2011) looked into the "Comparative reliabilities and validities of true-false test and multiple-choice tests constructed to measure the same objective in Michigan". The study revealed that students respond more to true-false item formats than multiple-choice item in a given period of time. The analysis also revealed that multiple-choice tests were more reliable though it measured the same thing that the true-false test measured.

The findings of the study revealed that there is no significant influence of objective test formats on students' performance in graphic-related economic concepts. This is so because all test formats used are objectively scored and students were prone to guessing. The finding of this study is supported by a study conducted by Eneja and Ikeh (2016) who examined the influenced of test item formats and school type on students' achievement in Financial Accounting in Imo State, used financial accounting achievement test adapted from 2015 NECO past question paper and modified into various test items format of essay test, multiple-choice test, true-false

test and matching test. Result of the analysis revealed that there was no significant difference in the mean achievement score of students in the four test formats.

Also, study by Gbore (2016) who examined the relative effectiveness of matching test, completion test and multiple-choice test formats on students' performance in Biology supports the result of this study. Gbore (2016) was interested in finding out if there is no significant difference in the mean scores of students in Biology completion items, matching items and multiple-choice items formats. Result of the analysis showed: Calculated F-value of 1.55 is less than the critical F-value of 3.00 (p<0.05) and thus, no significant difference in the mean scores of students in biology completion items, matching items and multiple-choice items.

Contrary to the result of the finding is a study done by Akamigbo (2014) on the relative achievement of students on different economics test formats in secondary schools in Nnewi education zone of Anambra state. Akamigbo (2014) reported a significant difference in the mean achievement score of students in multiple-choice, fill-in, matching and essay item test in Economics revealing that item format influences academic achievement of students in economics. Easy format requires indepth writing out of the answers in other to get the point, while multiple-choice, fill in and matching formats are objectively scored.

The finding of this study shows no significant influence of gender on students' academic performance in economics. This is so as both male and female students understand what success entails and are committed to it knowing that economics subject is a vital tool for furthering of studies in faculties of social science and Management by students in tertiary institution and also economics subject is a combination of both mathematical and theoretical application. The findings of this study was supported by studies of Abubakar and Oguguo (2011) who revealed no significant difference in the academic performance of female and male mathematics and science students of federal college of education (F.C.E) Omoku as a result of the emphasis on science technology and mathematics due

to the technological advancement in the world. Their study was to determine if there is no significant difference in the academic performance of female and male mathematics and science students of F.C.E Omoku in 2007/2008 session. The study employed an ex-post facto design and a sample of 332 students from school of science education was used for the study. Students' cumulative grade point average (CGPA) records, age and gender of students were the data collected and analyzed using independent t-test. Result of the analysis showed a calculated Z-value of -1.76 which is lower than the critical Z-value of 1.96 and as such, the hypothesis was accepted.

In the same vein, studies by Onuka and Durowoju (2011) motivation and gender as determinants of achievement in Senior Secondary School Economics in Ibadan North Local Government Area of Oyo State supports the result of this study. Intact arm of Senior Secondary Two Students (SSII) from four sampled schools giving a total of 200 subjects was used for the study. Data was collected and analyzed using Correlation and Independent T-test. The study showed no significant difference in students' academic achievement in Economics on gender basis due to the free interaction between male and female students and both having equal perception of what success is all about.

In contrast to the result of the finding is a study conducted by Titus, Dada and Adu (2016) to find out if gender is not a significant factor in students' academic performance in economics subject. 640 senior secondary school one and two students were the sample drawn from eight secondary schools in Ogun State. Questionnaire on school location and gender and economics achievement test of forty objective questions were the instruments for data collection. The data collected was tested using independent t-test and result showed t-value of 3.486 at 638 degrees of freedom: p<0.05. This implies that gender has a significant influence on the academic performance of students with the male students performing higher than female students. Also, Obo (2005) in his study on some student personal variables as predictors of mathematics achievement in secondary schools in central Cross River State, Nigeria to investigate the individual and interaction effects of students' gender, socio-economic and

causal attribution on mathematics achievement used a sample of 550 students (290 males and 260 females) from a population of 7, 360 students for the study. Data collected was with the use of 36-item questionnaire and 50 mathematics test items and was analyzed using multi-factor (3-way) analysis of variance. Result of the findings after statistical analysis at 0.05 level of significant revealed that the F-ratio for gender (5.313) and socio-economic background (3.096) are greater than the critical F-ratio of 3.86 and 3.02 respectively. While the F-ratio for causal attribution (2.551) is less than the critical F-ratio of 2.62. This shows that students' gender and socio-economic background significantly affect students' mathematics achievement while student causal attribution has no significant effect on students' mathematics achievement test. The interaction effect of students' gender, socio-economic background and causal attribution are not significant on mathematics achievement test. Also, Bitrus, Domiya and Hannatu (2016) reveal a significant gender difference in the academic performance of students in science subjects in favour of male students in WAEC and NECO for 2008 to 2010 session in Maiduguri.

The study by Alordiah, Akpadaka and Oviogbodu (2015) to determine if there is significant difference in the academic achievement of students in mathematics with respect to gender support the result of earlier studies. The study was carried out on a sample of 1900 senior secondary three (SS3) students selected from 723 secondary schools in Delta and Edo states. 50-items mathematics objective test was used to gather data and independent t-test was used for analysis. Result revealed the mean score for 1008 male students as 27.11 (SD=10.17) and mean score for 892 female students as 24.84 (SD=8.20). The computed t-value of 5.39 was significant at p=0.000, degree of freedom =1898 and thus there was a significant difference in the academic achievement of students in mathematics with respect to gender in favour of male students. This finding was supported by a study conducted in 2014 by Alade, Nwadingwe and Igbinoso (2015) to find out if there is no significant difference in the mean scores between socio-economic status (SES) and academic performance due to gender. Analysis of 350 sampled students from secondary schools in Isheri local government area of Lagos state shows a mean score and standard deviation of 7.62 and 4.30 respectively for males while 14.69 and 2.86 was the mean and standard deviation for females. The calculated t-value of 18.13 was greater than the critical t-value of 1.96 given 348 degrees of freedom at 0.05 level of significant and result shows that there exists gender difference between the mean scores of socio-economic status and students' academic performances. Mathematics test recorded a significant influence of gender on academic achievement of students as it is a subject that involves more calculation and most female students' exhibit fear of failure.

V. RECOMMENDATIONS

Based on the findings and conclusion of the study, the following were recommended:

1. Classroom teachers should be trained through regular workshops and seminars in proper test development and construction skills. They should also be encouraged to use varieties of instruments especially the forms of objective test that functions well as measures of both higher and lower mental abilities, keep students interest high in any testing session and improve students' performance especially.
2. Students whether males or females should be encouraged to exhibit the right attitude towards objective test and given equal opportunity through proper teaching and learning in other to have better cognitive achievement in graphic-related economic concepts.
3. Expertise in the field of educational research, measurement and evaluation should educate all teachers and potential teachers on the importance of conducting test reliability for any testing instrument.

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