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Development and Validation of Economics Achievement Test for Secondary Schools

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Abstract

Economics achievement test (EAT) for assessing senior secondary two (SS2) achievement in economics was developed and validated in the study. Five research questions guided the study. Twenty and 100 mid-senior secondary (SS2) economics students was used for the pilot testing and reliability check respectively. A sample of 250 students randomly drawn was used to subject initial 80 objective test items for the test try-out that yielded the data for item analysis. 50 items with difficulty indices ranged from 0.25 to 0.79 and discrimination indices of 0.20 to 0.58 where retained. Face and content validation of EAT was ensured by constructing items in line with the test blue print, the use of subject experts in SS2 economics and two experts in test construction. The test reliability established through Kuder-Richardson formula 20 gave a coefficient of 0.81. The test was found to be of good quality, valid and highly reliable. The EAT is therefore recommended for use in assessing SS2 students' achievement in economics and to determine/predict students that will do well in economics in their final class (SS3) as well as those that will have good performance in economics external examinations (WAEC and NECO).

Keywords: Development, Economics, Achievement test, Validation, Reliability, Item analysis, Senior secondary two.

Contents

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1. Introduction

Economics as a subject is part of the senior secondary curriculum which is expected of students to study for three years starting from senior secondary one till senior secondary three (SS1, SS2 and SS3). Economics in secondary school is aimed at bringing about desirable behavioral changes which may be overt or covert (Dike, 2002). Such behavioral changes which are the products of the objectives of the teaching/learning situations need to be quantified and qualified using achievement test. Achievement test- a test given to assess how far a student has learnt what was taught Onunkwo (2002) plays an important role in the school program. Achievement tests measure knowledge of facts, concepts and principles. They are primarily used in making classroom-level decisions and are designed with particular reference to the course objectives/learning goals of a specific course, study program or class (Mahajan, 2015). It indicate present, not future, proficiency. Such tests evaluates students' understanding of a particular instructional domain in order to make decisions regarding the advancement or capability of the students. Decisions made on students by using achievement tests can be biased if the achievement test used is not valid and reliable.

Thus, it is expected that the schools should have enough valid and reliable economics achievement tests for assessing how far their students at each level have learnt what was taught as well as to prepare them for external examinations such as West African School Certificate Examination (WASCE) and National Examination Council (NECO). Inadequate valid achievement test according to Allen (2005) is a reason many teachers continue to assign invalid grades to students. If the grades are not accurate measures of the student's performance, then they do not communicate the truth about the level of the student's academic achievement.

Since important decisions are often based on a student's grade, invalid achievement tests, hence grades may result in dire consequences for the student. If students receive grades lower than ones that accurately depicts their true level of economics academic achievement, it may lead students to believe they lack the ability to succeed academically in economics and lower their sense of self-efficacy as well as their motivation to do well in WAEC and NECO economics examinations (Osadebe, 2012).

Also, with high grades in (WAEC and NECO) economics examinations, students get admitted to colleges and universities of their choice, study courses of their choice like Economics, Banking, Finance, Accounting and other related courses and receive scholarships and tuition assistance, since grades are a major selection criterion in tertiary schools admission process in West African countries like Nigeria, Ghana and Liberia (Pintrich and Schunk, 2002). The reverse is also true. It is very difficult for students to get admitted to some schools if their grades are not sufficiently high. Invalid grades that understate the student's knowledge as a result of invalid assessment tool may prevent a student with ability to pursue certain educational or career opportunities (Pintrich and Schunk, 2002).

Esomonu and Agbonkpolo (2010) and Osadebe (2012) observed that most teachers are not good in constructing valid and reliable test in their various subject areas. Teachers find it easy to construct test items in the lower cognitive levels (knowledge and comprehension) than the higher cognitive levels (application, analysis, synthesis and evaluation). This constitutes an educational problem.

So, a valid and reliable items for evaluating students' achievement in economics secondary school are rare and the possibility of constructing such items by the classroom teacher is limited because it is an art that only experts in test construction does. It involves a couple of steps scrupulous analysis, and substantial time (Esomonu and Agbonkpolo, 2010). Therefore, there is a dire need for experts to construct enough valid and reliable achievement tests for use in senior secondary levels.

However, previous effort have been made by researchers to construct achievement test in economics. Mahajan (2015) constructed and standardized achievement test in economics for standard XI but only on few selected topics without covering all the topics. Also Osadebe (2014) constructed a multiple choice objective economics achievement test which should be administered only to senior secondary three (SS3) students when they have covered the WAEC or NECO economics syllabus. The two researchers did not explore on the development of achievement test for SS2 (mid-senior secondary level) economics. Therefore, there is an educational need for the development and validation of an achievement test in economics for mid-senior secondary level students covering all the topics in their curriculum.

Consequently, the researcher focused on the development and validation of economics achievement test for senior secondary two (SS2) students using various types of objective tests. The items constructed in this study covers only the topics in SS2 curriculum, to make achievement test for SS2 available to teachers. This test will enable teachers evaluate SS2 students' proficiency/competency in economics before entering SS3, thereby identify students that can perform well in WAEC and NECO economics examination. The constructed test will serve as a major contribution to the need of valid and reliable economics achievement test in senior secondary two.

To the best of our knowledge, no achievement test has been done on the subject of economics for the mid-senior secondary levels. The objective of this study therefore, is the development and validation of an economic achievement test for mid-senior secondary level.

1.1. Research Questions

The study sought answers to the following research questions.

1. What are the difficulty indices of the EAT items?
2. What are the discrimination indices of the EAT items?
3. What are the distracter indices of the EAT items?
4. How valid is the EAT?
5. To what extent is the EAT reliable?

Table-1. Economics Achievement Test Table of Specification

OBJECTIVE	KNOWLEDGE 41%	COMPREHENSION 9%	APPLICATION 7%	ANALYSIS 19%	SYNTHESIS 9%	EVALUATION	TOTAL
TOPICS							
Demand and Supply 17%	**9**	**0**	**0**	**4**	**0**	**0**	**13**
Meaning	1	-	-	-	-	-	1
Demand and Supply Curves	4	-	-	-	-	-	4
Law of demand and Supply	2	-	-	-	-	-	2
Factors affecting demand and supply	-	-	-	1	-	-	1
Equilibrium Price and Quantity	1	-	-	2	-	-	3
Types of Demand and Supply	1	-	-	1	-		2
Production (PPC) 7%	**2**	**1**	**1**	**0**	**1**	**1**	**6**
Meaning	1	1	-	-	-	-	2
Basic Concept (TP, AP and MP)	1	-	1	-	1	-	3
Laws of variable Proportion	-	-	-	-	-	1	1
Revenue/Cost 10%	**3**	**1**	**2**	**0**	**1**	**1**	**8**
Basic Concepts (cost)	1	-	2	-	-	-	3
Shot and Long run Cost	1	-	-	-	-	-	1
Eco and Acc. View of cost	1	-	-	-	-	1	2
Revenue Concept	-	1	-	-	1	-	2
Economic System 9%	**4**	**0**	**0**	**1**	**1**	**1**	**7**
Capitalism	3	-	-	1	-	-	4
Socialism	-	-	-	-	-	1	1
Mixed Economy	1	-	-	-	1	-	2
Un-employment 12%	**2**	**1**	**2**	**2**	**1**	**2**	**10**
Meaning	-	1	2	-	-	-	3
Types	-	-	-	1	-	1	2
Causes	2	-	-	-	-	1	3
Effect	-	-	-	-	1	-	1
Solution	-	-	-	1	-	-	1
Utility Theory 10%	**2**	**1**	**1**	**1**	**1**	**2**	**8**
Meaning	2	-	-	-	-	-	2
Basic Concepts	-	-	1	-	-	-	1
Law of Diminishing Marginal Utility	-	-	-	-	-	1	1
Utility Maximization	-	1	-	1	-	1	3
Derivation of demand Curve	-	-	-	-	1	-	1
Public Finance 12%	**5**	**1**	**0**	**2**	**0**	**2**	**10**
Objective	1	-	-	-	-	-	1
Direct and Indirect taxation	4	-	-	1	-	1	6
Budgets	-	1	-	1	-	1	3
Financial Institution 7%	**2**	**0**	**0**	**3**	**0**	**1**	**6**
Types	-	-	-	2	-	-	2
Functions	2	-	-	1	-	1	4
Inflation 8%	**2**	**1**	**0**	**1**	**1**	**1**	**6**
Meaning	1	1	-	-	-	-	2
Cause	-	-	-	1	-	-	1
Effects	1	-	-	-	-	-	1
Control	-	-	-	-	1	1	2
Industrialization 8%	**2**	**1**	**0**	**1**	**1**	**1**	**6**
Types	2	1	-	-	-	-	3
Localization	-	-	-	1	1	1	3
Total	**33**	**7**	**6**	**15**	**7**	**12**	**80**

Source: Lydia Ijeoma Eleje

1.2. The Test Development Process

The stages of achievement tests development used in this study as listed by Ohuche and Akeju (1988); Mahajan (2015) and Osadebe (2014) comprises of planning the test, constructing the test items, pilot testing, trial testing, item analysis, and assembling of final test. The following describes each of the stages.

Planning the test: In this section, the sample and sample technique, content and table of specifications are described. The sample for the test try-out consisted of 250 randomly selected senior secondary two (SS2) economics students from 6 secondary schools and the sample for establishing the reliability consisted of 100 SS2 economics students from 3 secondary schools. All in Anambra State of Nigeria, for the 2015/2016 academic session.

The content area of the study is based on the SS2 economics curriculum. The test table of specifications consisted of 80 items in the content area of SS2 economics curriculum. Various units of the test content were listed along the rows while different educational objectives to be tested were listed along the columns (See Table 1).

Constructing the test: Various formats of the objective test was used in the construction of the EAT because of its being objectively scored and versatility in content coverage (Winarni, 2002). Following the guidelines stipulated by Olubodum (2009) and Suen and McClellan (2003) eighty (80) items that are in line with the table of

specifications were constructed using economics text books recommended by the Ministry of Education (Anyaele, 2003; Anyanwuocha, 2006).

The constructed items in its initial draft were given to two experts in educational measurement and evaluation, and two experienced SS2 teachers of economics for face and content validation. Their expert observations, comments and suggestions were incorporated in the modifications of the test.

Pilot testing: Pilot testing was done on 20 SS2 economics students of a secondary school in Anambra State to check grammatical error and compatibility of the EAT test items (Winarni, 2002).

The test try-out: The test try-out was administered to 250 SS2 economics students during third term of 2015/2016 academic session when subject teachers and SS2 students had completed the teaching and learning of the test content. The test try-out was for the purpose of item analysis.

Item analysis: It is done to ensure the quality of the items. It involved seven (6) main steps.

Step 1- Identify the higher and lower achievers.

Step 2- Process test responses.

Step 3- Calculate item difficulty index.

Step 4- Calculate item discrimination index.

Step 5- Calculate the distracter indices.

Step 6- Selection of good items. An item was considered good for inclusion in the final output of the test if it had difficulty index of 0.30 to 0.70, discrimination index greater than 0.20 and a positive distracter index. However, items with appropriate difficulty indices but with discrimination indices of less than 0.20 were not accepted as good. Also items with appropriate discrimination index but have difficulty index of less than 0.20 or more than 0.80 were rejected (See Table 2). This according to Esomonu and Agbonkpolo (2010) is to ensure the content validity of the test. Fifty (50) items that mate the criteria were selected as the final draft of the EAT.

Assembly of final test: The final version of the EAT (50 items) were arranged in-line with the content area.

1.3. Validity of the Test

The 80 items of the test was face and content validated by two experts in educational measurement and evaluation, and two experienced senior secondary two teachers of economics. These experts were requested to scrutinize the items (stems, options, keys and distracters) of the DET in terms of clarity, relevance, adequacy and comprehensiveness of the items. To guide the experts in the validation exercise, the topic of this study and table of specifications together with the draft test were given to the experts. After examining the test, they made some corrections on some of the items. Their expert observations, comments and suggestions were used in the modifications of the test.

1.4. Reliability of the Test

To estimate the reliability of the economics achievement test EAT Kuder-Richardson formula 20(K-R_{20}) were employed. Final version of the EAT wear given to 100 randomly selected SS2 students. The computation of K-R_{20} is to ensure the internal consistency.

2. Results

The results of the study were presented and analyzed below.

Research Question One and Two

What are the difficulty and discrimination indices of the EAT items?

Table-2. The difficulty and discrimination indices obtained after EAT item analysis

Summary Table of Difficulty and Discrimination indices						
Item	**Key (K)**	**No of correct responses among Higher achievers (H) N=83**	**No of correct responses among Lower achievers (L) N=83**	**Difficulty index $\frac{H+L}{2N}$**	**Discrimination index $\frac{H-L}{N}$**	**Remark**
1.	Correct	35	14	0.30	0.25	Retain
2.	False	40	18	0.35	0.27	Retain
3.	D	66	38	0.63	0.34	Retain
4.	Correct	17	8	0.15	0.11	Reject
5.	A	66	31	0.58	0.42	Retain
6.	Correct	74	41	0.69	0.40	Retain
7.	C	25	11	0.22	0.17	Reject
8.	True	79	69	0.90	0.12	Reject
9.	B	43	24	0.40	0.23	Retain
10.	D	65	53	0.71	0.14	Reject
11.	B	60	35	0.57	0.30	Retain
12.	D	66	42	0.65	0.29	Retain
13.	True	61	71	0.80	-0.12	Reject
14.	B	57	27	0.51	0.36	Retain
15.	Correct	62	14	0.46	0.58	Retain
16.	Correct	75	50	0.75	0.30	Retain
17.	D	62	15	0.46	0.57	Retain
18.	B	68	33	0.61	0.42	Retain
19.						*Continue*

20.	D	75	50	0.75	0.30	Retain
21.	A	66	31	0.58	0.42	Retain
22.	C	58	22	0.48	0.42	Retain
23.	Correct	32	10	0.25	0.27	Retain
24.	False	16	13	0.17	0.04	Reject
25.	D	77	43	0.72	0.41	Retain
26.	C	58	30	0.55	0.34	Retain
27.	C	41	34	0.45	0.08	Reject
28.	C	25	28	0.32	-0.04	Reject
29.	C	20	10	0.18	0.12	Reject
30.	B	36	35	0.43	0.01	Reject
31.	Correct	73	54	0.77	0.23	Retain
32.	Correct	70	53	0.74	0.20	Retain
33.	Correct	60	22	0.49	0.46	Retain
34.	Correct	71	50	0.73	0.25	Retain
35.	A	50	13	0.38	0.45	Retain
36.	D	59	23	0.49	0.43	Retain
37.	B	42	20	0.37	0.27	Retain
38.	C	56	35	0.55	0.25	Retain
39.	C	50	35	0.51	0.18	Reject
40.	A	51	36	0.52	0.18	reject
41.	A	78	42	0.72	0.43	Retain
42.	Correct	79	66	0.87	0.16	Reject
43.	B	59	34	0.56	0.30	Retain
44.	C	32	38	0.42	-0.07	Reject
45.	Correct	69	15	0.51	0.65	Retain
46.	B	32	10	0.25	0.27	Retain
47.	C	42	37	0.48	0.06	Reject
48.	A	45	13	0.35	0.39	Retain
49.	C	42	23	0.39	0.23	Retain
50.	D	47	30	0.46	0.20	Retain
51.	B	13	23	0.22	-0.12	Reject
52.	A	40	25	0.39	0.18	Reject
53.	D	54	37	0.55	0.20	Retain
54.	Correct	82	80	0.98	0.02	Reject
54.	Correct	83	81	0.99	0.02	Reject
55.	B	52	41	0.56	0.13	Reject
56.	D	70	44	0.69	0.31	Retain
57.	D	53	32	0.51	0.25	Retain
58.	A	65	26	0.55	0.47	Retain
59.	D	68	57	0.75	0.13	Reject
60.	A	67	19	0.52	0.58	Retain
61.	A	65	30	0.57	0.42	Retain
62.	C	39	28	0.40	0.11	Reject
63.	True	82	70	0.92	0.14	Reject
64.	D	73	34	0.64	0.47	Retain
65.	A	61	31	0.55	0.36	Retain
66.	C	32	21	0.32	0.13	Reject
67.	B	54	37	0.55	0.20	Retain
68.	A	76	49	0.75	0.33	Retain
69.	A	4	8	0.07	-0.05	Reject
70.	C	35	21	0.34	0.17	Reject
71.	B	29	23	0.31	0.07	Reject
72.	A	37	25	0.37	0.14	Reject
73	True	79	52	0.79	0.33	Retain
74.	A	68	39	0.64	0.35	Retain
75.	C	8	16	0.14	-0.10	Reject
76.	D	66	48	0.69	0.22	Retain
77.	A	47	41	0.53	0.07	Reject
78.	C	59	24	0.50	0.42	Retain
79.	A	76	43	0.72	0.40	Retain
80	B	51	16	0.37	0.49	Retain

Source: Lydia Ijeoma Eleje

Research Question Three

What are the distracter indices of the EAT?

Table-3. The distracter indices obtained after EAT item analysis

Item	No of respondents who choose option True, Correct		No of respondents who choose option B, False, Incorrect		No of Respondents who choose option C		No of respondents who choose option D		Omit	Total	Distractibility L – H U			Index ₦ = 83	Remarks
NO	L	H	L	H	L	H	L	H			A	B	C	D	
1	14	35	64	49					4	166		0.18			A good item
2	62	35	18	40					11	"	0.33	K			A good item
3	3	4	12	1	27	12	38	66	3	"	-0.01	0.13	0.18	K	Option A replaced
5	31	66	14	4	18	-	9	10	18	"	K	0.30	0.22	-0.01	Option D replaced
6	41	74	27	9					15	"	K	0.22			A good item
9	44	25	24	43	4	10	5	-	11	"	0.23	K	-0.07	0.06	Option C replaced
11	16	10	8	1	13	6	42	66	4	"	0.07	0.08	0.08	K	Distracters are ok
12	5	3	35	60	12	2	13	14	22	"	0.02	K	0.12	-0.01	Option D replaced
14	28	10	27	57	7	-	15	8	21	"	0.22	K	0.08	0.08	Distracters are ok
15	14	62	35	41					14	"	K	-0.07			Item amended
16	50	75	20	7					14	"	K	0.16			A good item
17	8	10	15	1	24	4	15	62	27	"	0.02	0.16	024	K	Distracters are ok
18	10	1	33	68	13	4	9	3	25	"	0.11	K	0.13	0.07	Distracters are ok
19	23	3	4	1	4	4	50	75	2	"	0.24	0.04	0	K	Distracters are ok
20	31	66	20	-	10	4	12	8	15	"	K	0.24	0.07	0.05	Option Camended
21	8	7	23	14	22	58	18	2	14	"	0.01	0.12	K	0.19	Distracters are ok
22	10	32	42	35					47	"	K	0.08			Distracters are ok
24	2	1	16	2	12	2	43	77	11	"	0.01	0.17	0.12	K	A good item
25	12	5	18	10	30	58	10	-	23	"	0.08	0.10	K	0.12	Distracters are ok
30	54	73	25	10					4	"	K	0.18			Distracters are ok
31	3	70	27	12					4	"	K	0.18			A good item
32	22	60	59	23					2	"	K	0.43			A good item A good item
33	50	71	29	12					4	"	K	0.20			A good item
34	13	50	31	18	18	6	9	3	18	"	K	0.16			A good item
35	14	8	11	5	20	9	23	59	17	"	0.07	0.07	0.13	K	A good item
36	22	15	20	43	16	16	10	2	23	"	0.08	K	0	0.12	Distracters are ok
37	13	14	26	13	35	56	3	-	6	"	-0.01	0.16	K	0.04	Option D replaced
40	42	78	17	1	4	2	11	2	9	"	K	0.19	0.02	0.12	Option A amended
42	26	18	34	59	6	1	11	4	7	"	0.01	K	0.06	0.08	Distracters are ok
44	15	69	17	9					56	"	K	0.10			Distracters are ok
45	55	43	10	32	9	4	4	1	8	"	0.14	K	0.06	0.03	A good item
47	13	45	20	11	30	6	10	16	15	"	K	0.11	0.29	-0.07	Distracters are ok
48	13	17	15	10	23	42	24	11	11	"	-0.04	0.06	K	0.16	Option D replaced

Continue

49	27	27	5	2	11	3	30	47	15	“	0.01	0.04	0.10	K	Option A replaced
52	21	21	5	11	11	2	37	54	18	“	0.12	-0.07	0.11	K	Distracters are Ok
56	13	13	16	2	8	4	44	70	6	“	0.12	0.17	0.05	K	Replace Option B
57	20	20	15	14	14	5	32	53	2	“	0.11	0.01	0.11	K	Distracters are Ok
58	26	26	9	3	7	7	24	3	22	“	K	0.07	0	0.25	Option Camended
60	19	67	23	4	14	5	15	6	13	“	K	0.23	0.11	0.11	Distracters are ok
61	30	65	26	16	10	1	6	1	11	“	K	0.12	0.11	0.06	Distracters are ok
64	24	5	10	1	4	2	34	73	13	“	0.23	0.11	0.02	K	Distracters are ok
65	31	61	6	-	10	6	28	10	14	“	K	0.07	0.05	0.22	Distracters are ok
67	5	9	37	54	5	6	28	14	8	“	-0.05	K	-0.07	0.17	OptionA&Creplaced
68	49	7	7	1	17	4	3	3	6	“	K	0.07	0.16	0	OptionD amended
73	52	79	23	4	-	-	-	-	8	“	K	0.23			A good item
74	39	68	23	8	4	2	3	3	16	“	K	0.18	0.02	0	OptionD amended
76	4	3	3	-	12	13	48	66	17	“	0.01	0.04	-0.01	K	Option C replaced
78	10	9	9	2	24	59	17	2	26	“	-0.08	0.08	K	0.18	Option A replaced
79	43	11	11	1	5	3	8	2	17	“	K	0.12	0.02	0.07	Distracters are ok
80	11	12	10	51	20	5	24	11	22	“	-0.01	K	0.18	0.16	Option A replaced

Source: Lydia Ijeoma Eleje

Research Question 4

How valid is the EAT?

Validity of the test was done by matching the test items from the objectives (See Table 1) and presenting the whole test to two experts in the test construction and two experienced teachers in the content areas of SS2 economics for item review. These experts guaranteed that the instrument had strong content validity in which each item represented the content area being investigated, rather than asking unrelated questions.

Research Question 5

To what extent is the DET reliable?

Estimate of EAT reliability using Kuder-Richardson formula 20(K-R_{20}) gave an index of 0.81.

3. Discussion

The quality of a test is evident in the appropriateness of the test item parameters (difficulty, discrimination and distracter indices) obtained from item analysis. As shown in this study, 50 items that were found to be good with appropriate difficulty and discrimination indices were retained. Items numbers 4, 23, 28, 69 and 75 had difficulty indices that were less than 0.20. This means that they were very difficult items. Items numbers 8, 41, 53, 54 and 63 in the current study was found to be very easy. In this study, six (13, 27, 43, 50, 69, 75) items had negative discrimination indices. This indicated that low ability students performed better on those items than high ability students as previously described by Eleje *et al.* (2016). Such items discriminated but in the negative (wrong) direction. On the other hand, 24 items had low but positive discrimination values ($0.0 \leq 0.20$). This implied that students who incorrectly answered these items also scored high on the test overall, while students who correctly answered the items scored low on the test overall.

Also observed in the It was also observed in Table 3 that out of 50 EAT items retained, 33 items have good/positive distracters and some distracter indices of the 17 items were either negative or zero. The positive value indicated that the distracters are good. It also implied that more of the students in the low ability group chose the distracter than those in the high ability group. The negative or zero value of the indices indicated that the distracters were bad or poor. The distracters with negative or zero values were reviewed then replaced or amended for improvement and ease of the test takers. Other items were also improved by restructuring the manner of questioning to lesson confusions in answering this is also in line with a study conducted by Eleje *et al.* (2016) and Esomonu and Agbonkpolo (2010).

Validity of the test was done by matching the test items from the objectives (See Table 1) and presenting the whole test to two experts in the test construction and two experienced teachers in the content areas of secondary economics for item review. These experts guaranteed that the instrument had strong content validity in which each item represented the content area being investigated, rather than asking unrelated questions. This implied that all the objectives and content areas were well covered in the table of specifications. Thus the economics achievement test has a good content validity.

The reliability estimate of EAT was done through Kuder-Richardson formula 20 analysis. The result shows that a reliability estimate of 0.81 was obtained. That is, there is 0.81 degree of consistency with which the item of EAT evaluates economics achievement of SS2 students. A reliability index of 0.81 implied that the EAT is highly reliable. According to Ceniza and Cereno (2012) the reliability coefficient within the range of 0.81 to 1.0 signified high reliability, 0.61 to 0.80 signified a moderate reliability, 0.41 to 0.60 signified fair reliability, 0.10 to 0.40 signified slight reliability, and less than 0.10 signified no reliability. Therefore, the test reliability was high and could be used by teachers to assess senior secondary two (SS2) students' achievement in economics. The use of KR20 in this study was appropriate. Since this study involves development of a test instrument that is dichotomously scored and where scores for the various items will be added or aggregated to produce a single or composite score/grade (Nworgu, 2006; Osadebe, 2014).

4. Conclusion

A good, valid and reliable economics achievement test for SS2 students' was developed in this study. This is evident in the results of reliability and item analysis of the test conducted. The item analysis conducted on the test items showed that the test overall difficulty were within the range of 0.25 to 0.79 and the discrimination indices were within the range of 0.20 to 0.58. This means that the EAT has a moderate level of difficulty and the discrimination indices, a moderate one (Ceniza and Cereno, 2012; Eleje *et al.*, 2016). The validity of the instrument was determined through the use of test blue print or table of specifications and expert judgment. This helped to establish high face and content validity. A reliability estimate of the EAT through the use of Kuder-Richardson formula 20 gave an index of 0.81. This implied that the currently developed economics achievement test (EAT) is high reliability.

Hence, it could be concluded that the economics achievement test developed in this study is of good quality, valid and highly reliable. Thus, the developed, validated and reliable EAT can now be used in assessing SS2 students achievement in economics and to predict students that can do well in economics in their SS3. It is an instrument that can measure the desired trait of senior secondary two economics in Nigeria.

5. Recommendations

Since the findings of this study revealed that the EAT is valid, reliable and of good quality, the researchers' recommend that the test be used by the teachers to assess mid-senior secondary (SS2) students' achievement in economics. Teachers should also use the test to determine/predict students that will do well in economics in their final class (SS3) as well as those that will have good performance in economics external examinations (WAEC and NECO).

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Appendix-1.

ECONOMICS ACHIEVEMENT TEST (EAT) FOR SENIOR SECONDARY TWO (SS2)

1. (1) The means of production in a free economic system is owned and controlled by _____
2. (2) In capitalist economic goods are not produced to yield profits. True false
3. (3) The Major types of economic system includes

(a) Socialism (b) Capitalism (c) Mixed economy (d) All of the above

4. (5) Socialism is different from capitalism in that government participation is (a) high (b) low (c) moderate (d) absent
6. (6) A mixed economic system has a mixture of the elements of both _____ and _____

(9) The downward slope of production possibility curve indicates or illustrates

(a)Marginal product

(b)Opportunity cost

(c) Marginal revenue

(d) Money cost

7. (11) If the number of the labourers is increased from 30 to 32 and production 3000kg to 3300kg of corn, generate the MP.

(a)100kg (b)150kg (c)30kg (d)300kg

8. (12) Which of the following best describe total product (TP)?

(a) TP = MP + AP (b) AP + L = TP (c) TP = Mp x AP (d) TP = AP x L

9. (14) Cost of production is known as

(a) variable cost divided by the total unit of output

(b) various expenses incurred in the use of the four factors of production

(c) money cost divided by the total unit of output

(d) real cost incurred in the use of production plants unit of output

10. (15) In the long-run all factors of production _____
11. (16) The two view in cost are_____ and_____
12. (17) Given that fixed cost is ₦500.00, variable cost is ₦1,500 and output is 50units, find the cost of producing one.

(a) ₦2.00 (b)₦60.00 (c) ₦50.00 (d.)₦40.00

13. (18) Calculate for TC (a) ₦50.00 (b)₦2000.00

(c) ₦5000.00 (d) ₦40.00

14. (19) Which of the following best describe revenue

(a) Marginal Revenue from a firm's sale of its commodities

(b) income earned from government sale of its commodities (c) average and fixed revenue from firm's sale of its commodities (d) income earned from a firm's sale of it's commodities.

15. (20) Profit can be divided by

(a) subtracting total cost from total revenue

(b)subtracting average revenue from total cost

(c)dividing total revenue by total output

(d)dividing marginal revenue by marginal cost

16. (21) Economics argues that cost must be viewed in terms of

(a) money cost

(b) amount of money spent

(c) alternative forgone

(d) total cost

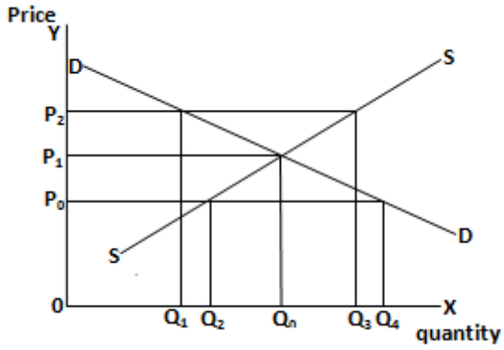
17. (22) The two schools of thought in the analysis of utility are ____ and ____

18. (24) If the last naira spent on each commodity by a consumer gave him equal satisfaction it means the consumer has been able to
(a) cut cost (b) maximize costs (c)increase profits (d)maximize utility
19. (25) A rational consumer utility maximization can be illustrated thus
(a) $\frac{MUX}{PX} > \frac{MUY}{PY}$ (b) $\frac{MUX}{PY} = \frac{MUY}{PY}$
(c) $\frac{MUX}{PX\ PY} = \frac{MUY}{}$ (d) $\frac{MUX}{PX} < \frac{MUY}{PY}$

Match the following items according to the expression given in A-E

(30) Demand curve slopes.	(A)Effective demand
(31) Supply curve slopes.	(B) Demand Schedule
(32) The higher the price the higher the quantity.	(C) Upwards (D) Downwards
(33) Demand curve is a diagrammatical representation of.	(E) Demanded (F) Supplied

Use the diagram below to answer questions 34-36



24. (34) At price OP1
(a) demand exceeds supply
(b) supply exceeds demand
(c)demand equal supply
(d) OQ1 is the quantity demand.
25. (35) The equilibrium price is (a) Op1 (b) OP2 (c) P1 Po (d) OPo
26. (36) At price Op2
(a)demand exceeds supply
(b)supply exceeds demand
(c)demand equal supply
(d)OQ2 is the quantity demand.
27. (37) Demand in economics is synonyms with
(a) needs not backed up with ability to pay
(b) wants backed up with ability to pay at different time
(c) wants supported with ability to pay at the same time
(d) desire not supported with ability pay at the same time.
28. (40) Which of the following is derived demand
(a) labour (b)butter
(c) television (d) bread
29. (42) A demand schedule is described as a table containing the
(a) Price and quantity of a commodity (b) relationship between price and quantity demanded of a commodity (c) relationship between quantity demanded and supplied of a market (d) quantity of goods the consumer is prepared to buy.
30. (44) A proportional tax is a tax whose percentage rate remains constant as the tax base _____
31. (45) Which of the following best explains the budget?
(a) plan of government financial operation for a year
(b) detailed estimate of government financial operation for a year
(c) satisfactory balance between income and expenditure for a year
(d) plan for importation of essential goods and services for a year
32. (47) Budget deficit is an economy can be solved with the use of (a) former reserves (b) full employment (c) trade unions (d) low price
33. (48) If demand is perfectly inelastic, the effective incidence of an indirect tax will be transferred to (a) employer (b) employee (c) consumer (d) civil servants.
34. (49) All the following are specific examples of indirect tax except (a)purchase tax (b) import duty (c) export duty (d) poll tax
35. (50) Regressive tax is not a good tax system because it
(a)is not convenient to pay

(b)is not certain what to pay
(c)is not economical to collect
(d)does not ensure equity in payment.
36. (56) An effect of unemployment include (a)population control
(b) technological progress (c)earning capacity (d)escalation of crime
37. (57) To solve the problem of unemployment, government should do all except
(a) restructure the educational curricula at all levels
(b)encourage education beyond primary and secondary schools
(c)develop the rural areas
(d)use capital intensive method of production
38. (58) If there is 20million people in the working class age group and 5 million of them are unemployed, compute the rate of unemployment (a)25% (b)50% (c)20% (d)5%
39. (60) Voluntary unemployment differs from structural unemployment because
(a)it is deliberate refusal of labour to work
(b)it involves immobility of labour
(c) there is increase in dependants
(d)people are partially unemployed
40. (61) The concept of unemployment could be used in relation to any of the factors of production which is
(a)idle and not being utilized for production
(b)not fully implemented in work
(c)fully utilized for production
(d)used part time in work
41. (64) Examples of financial institutions include all except
(a) finance house (b) central bank
(c) stock exchange (d) trade by barter
42. (65) Money market is made up of institutions which provide
(a) short-term loan
(b) long-term loan
(c) capital-term loan
(d) money-term loan
43. (67) One of this is an example of capital markets
(a)discount houses (b)finance companies
(c) saving banks (d)central banks
44. (68) Development bank as a capital market is important because it
(a)provide medium and long term loans to investors
(b)develop money and capital market
(c)acts as banker's bank
(d)acts as financial adviser to government
45. (73) The use of monetary policy to control, inflation is good because it reduces the rate at which commercial bank lend to the public. True False
46. (74) Inflation in an economy can be recognized through a
(a) persistent rise in the general price level
b) rise in the general price level
(c) fall in the general price level
(d) persistent fall in the general price level
47. (76) Examples of an industry include all except
(a) manufacturing industry
(b)construction industry
(c)transport industry
(d)galloping industry
48. (78) Which of these does not encourage industrial development?
(a)Tax exemption
(b) Government direct participation
(c)Limitation of market for industrial products
(d)Provision of infrastructural facilities
49. (79) Which of the following should be considered in the plan to locate an industry?
(a)Nearness to the market
(b)A pool of skilled labour
(c)High prices of inputs
(d)Nearness of pollution
50. (80) Localization of industry is criticized in that it leads to
(a) pool of skilled labour
(b) high prices of inputs
(c) improvement in infrastructure
(d) co-operation among firms

Appendix-2.

ECONOMIC ACHEIVEMENT TEST ANSWER (KEY) FIFTY (50) OBJECTIVE TEST ITEMS

1	(1) Private individuals	26	(36) B
2	(2) False	27	(37) C
3	(3) D	28	(40) A
4	(5) A	29	(42) B
5	(6) Capitalism and Socialism	30	(44) Varies
6	(9) B	31	(45) B
7	(11) D	32	(47) A
8	(12) B	33	(48) C
9	(14) B	34	(49) D
10	(15) Varies	35	(52) D
11	(16) Economics and Accountants	36	(56) D
12	(17) D	37	(57) D
13	(18) B	38	(58) A
14	(19) D	39	(60) A
15	(20) A	40	(61) A
16	(21) C	41	(64) D
17	(22) cardinal and ordinal	42	(65) A
18	(24) D	43	(67) B
19	(25) C	44	(68) A
20	(30) Downwards	45	(73) True
21	(31) Upwards	46	(74) A
22	(32) Supplied	47	(76) D
23	(33) Demand Schedule	48	(78) C
24	(34) A	49	(79) A
25	(35) D	50	(80) B