



Development and Validation of Financial Accounting Cognitive Achievement Test for Senior Secondary Schools in Rivers State

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ABSTRACT

Financial Accounting Test (FAT) for assessing senior secondary two (SS2) cognitive achievement was developed and validated in the study. The study was guided by five research questions. Thirty senior secondary (SS2) Financial Accounting students was used for the pilot testing and to establish the reliability coefficient of the items. A sample of 219 Financial Accounting students were selected randomly and used to subject initial 50 objective test items for the test try-out that yielded the data for item analysis. 50 items with difficulty indexes ranged from 0.25 to 0.79 and discrimination indices of 0.20 to 0.58 where retained. Face and content validation of FAT was ensured by constructing items in line with the test blue print, the use of subject experts in SS2 Financial Accounting and two experts in test construction. The test reliability established through Kuder Richardson formula 20 gave a coefficient of 0.81. The test was said to be valid and reliable. The FAT is therefore recommended for use in assessing SS2 Financial Accounting students' cognitive achievement in Financial Accounting as well as to predict students that will record good performance in Financial Accounting in their final class (SS3) as well as those that will have good performance in WAEC and NECO specifically in the subject (Financial Accounting).

Keywords: Development, Validation, Financial Accounting, Cognitive, Achievement, Test.

INTRODUCTION

In the teaching-learning environment, there is a constant need to gauge the outcome or the quality of responsiveness of the teaching and learning process. This important symbiotic process generally referred to as assessment, does not only occur after teaching but can also be undertaken before teaching is affected or during the teaching process. More specifically, concepts of test, continue to dominate educational practice around the world. More so, depending on the nature and stage at which it is conducted, teachers have over the years applied different types of assessments for varied purposes (Inomiesa, 2008). Financial accounting is the field of accounting concerned with the summary, analysis and reporting of financial transactions related to a business. This involves the preparation of financial statements available for public use.

Stockholders, suppliers, banks, employees, government agencies, business owners, and other stakeholders are examples of people interested in receiving such information for decision making purposes. Financial accountancy is governed by both local and international accounting

standards. Generally Accepted Accounting Principles (GAAP) is the standard framework of guidelines for financial accounting used in any given jurisdiction. It includes the standards, conventions and rules that accountants follow in recording and summarizing and in the preparation of financial statements.

Financial Accounting 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). In secondary schools, Financial Accounting is aimed at bringing about desirable behavioural knowledge of record keeping and calculation as well as changes which may be overt or covert (Adams, 2018). Such knowledge which is a 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. Financial Accounting plays an important role in the school programme and in the public/private sector respectively. 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 (Effiong, 2006). 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. The relevance of test to testees makes it fundamental for tests of higher standard to be used in collecting information which reflect their true potentialities (Ubolom, Uzoeshi, Amini & Vipene, 2011). The qualities of a good test therefore could be broadly classified into two main areas, namely; intrinsic and extrinsic qualities. The intrinsic qualities constitute the validity, reliability and usability, while extrinsic qualities embrace such characteristics as administration and scoring of tests which test development incorporate.

Thus, it is expected that the schools should have enough valid and reliable Financial Accounting 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 Asuru (2015) 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 (Eleje, 2017). If students receive grades lower than ones that accurately depicts their true level of Financial Accounting academic achievement, it may lead students to believe they lack the ability to succeed academically in Financial Accounting and lower their sense of self-efficacy as well as their motivation to do well in WAEC and NECO economics examinations. Also, with high grades in (WAEC and NECO) Financial Accounting examinations, students get admitted to colleges and universities of their choice, study courses of their choice like Banking, Finance, Economics and other courses related 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 (Nkpone, 2001).

Test development is the set of activities involved in constructing and evaluating a test of some psychological function. The steps involves; specifying the construct of interest, deciding the test's function (diagnosis, description of skill level, prediction of recovery), choosing a method (performance, behavioural observation, self-report), designing item content, evaluating the reliability and validity of the test, and modifying the test to maximize its utility. Development of a test deals with planning of the test through the item writing to the trial testing stage. Validity of a test implies that a test measures what it sets out to measure and nothing else. A test that is valid is one that is truthful, accurate and relevant in measuring what it intends to measure. A test which is valid measures the content of what it sets to measure and no other thing (Ubolom et al 2011). The reliability of the test refers to the consistency of the results obtained by the same person when tested with the same instrument at different times or with different sets of equivalent tests. Test reliability, therefore, seeks to establish how possible it is to

reproduce the same or similar scores when the individual is measured again with the same or equivalent test (Obilor, 2018). The more nearly the scores are reproduced the higher the correlation coefficient and the more reliable the test. Usability or employability of a test is simply based on some common sense and practical considerations on whether a test can be used or not. These considerations include availability of equivalent form of the test, simplicity of instructions, ease of administration, ease of scoring, ease of interpretation and application of the test scores and test economy.

Most teacher-made achievement tests do not ensure these intrinsic and extrinsic qualities of validity, reliability, usability, administration and scoring. This study brings to focus the needed steps in test construction which are test planning, item writing, trial testing, item analysis, item selection, estimation of validity, computation of reliability values, and timing and printing of the final form of the test. Test planning includes all the preparatory processes in test construction, which is the first stage in the construction of achievement test. The processes are: stating and defining the objectives, outlining the content covered during instruction, and developing a test blueprints or table of specifications. Stating objectives behaviourally plays important roles in the teaching-learning encounter. Generally, they are the expected behavioural changes of the learner as a result of the teaching-learning encounter. They guide both the teaching and the assessment processes. The essence of stating the objectives is to determine the extent of the instructional objectives to be achieved. The objectives should be stated in specific behaviours that the students are expected to exhibit at the end of the lesson. They are usually stated using action verbs which clearly indicate specific and direct observable behaviours (Obilor & Obubere, 2020).

Outlining the content of instruction encompasses the various teaching content areas, units, topics, and sub-topics that constitute the course or subject as specified in course outline or syllabus (Asuru, 2015). To ensure that a test adequately samples the topics and sub-topics covered in the content, an outline of the content to be covered has to be made. This involves the breaking of the content into smaller units. For instance, a test on part one of educational measurement and evaluation for first degree students could be broken into the following units: basic concepts, types of tests, qualities of a good test, test construction, test administration and scoring, continuous assessment and soft skills. The Table of Specification is a two dimensional chart showing list of instructional objectives, content areas and types of items in its dimensions (Riaz, 2008). It also specifies the proportion of questions allotted to each of the behavioural objectives and topics of the content. Preparing the table of specification includes four main steps which are as follows: (a) Determine which instructional objectives to include. (b) Determine which content areas to include. (c) Determine the item types to include. (d) Prepare the 2-way chart (Table of Specification). Item writing requires both practical experience and professional judgement. It is worthy of note that 50% more items than needed should be written. After the item writing, the pool of items should be reviewed by another expert in the subject area of specialization to spot any ambiguities, grammatical faults. Then the pool of items should be produced for trial testing.

The trial testing is a very important stage in test construction because it is a stage of quality assurance/quality control and thus, determines whether each item and as well the entire test will be fit-for-purpose. This is determined both judgementally and statistically during item analysis. The items should be administered to a fairly representative sample of testees similar to those for whom the test is intended in terms of the content and objectives of their programme. The essence of the trial testing is to generate empirical data about the individual adequacy of each item and thus provide information for item analysis. Item analysis begins after the test has been administered and scored. It involves detailed and systematic examination of the testees' responses to each item to determine the difficulty level and discriminating power of the item. The procedure for item analysis involves arranging the scores in ascending order from the highest to the lowest scores. The scores of the highest 27% and lowest 27% testees' are selected and use. For instance, if the test was trial tested on 450 students, the scripts will be arranged in descending order of scores. One hundred and one highest scores (27% of 450) will be selected to make up the highest scorers and 121 lowest scores (27%, of 450) to constitute lowest scorers. The rest scripts will be

discarded. These highest 121 and lowest 121 scorers will be used for item analysis (Obilor & Obubere, 2020).

Item difficulty is simply the percentage of students who answer an item correctly. In this case, it is also equal to the item mean. The item difficult index ranges from 0 to 100; the higher the value, the easier the item (question). Item discrimination refers to the ability of an item to differentiate among students on the basis of how well they know the material being tested. Ideally, more testees in the upper group should get each item correct than those in the lower group, while effectiveness of distracters is one that attracts students with misconceptions or errors in thinking and reasoning, generally those with lower overall ability. It is expected that all the distracters in each item should operate effectively. This means that every distracter must be chosen by at least one person each from the upper and lower groups. Item selection implies where the number of items needed is selected. The items are to be first ranked in descending order based on the magnitude of their discriminating power. Those with zero and negative values should be rejected out rightly. In the case of item difficulty, there is no specific value to be selected, but it depends on the use of the test. Estimating the validity and reliability values of the test is the sixth step. In this step the researcher is to use any of the following methods: Validity: content, face, construct and criterion; Reliability: Test-Retest, Split-Half, Cronbach Alpha, Kuder Richardson, and Parallel Form. Timing and printing of the final form of the test is the last stage in test construction and should be done considering the age, sex, disposition, location and educational level of testees. Purpose of the test must be considered too when timing the test (Ugwu, 2012).

Consequently, the researcher focused on the development and validation of Financial Accounting 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 Financial Accounting 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 Financial Accounting for the mid-senior secondary levels. The objective of this study therefore, is the development and validation of Financial Accounting achievement test for mid-senior secondary level.

Statement of the Problem

Inadequate valid achievement test according to Onunkwo (2011) 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 Financial Accounting academic achievement, it may lead students to believe they lack the ability to succeed academically in Financial Accounting and lower their sense of self-efficacy as well as their motivation to do well in WAEC and NECO economics examinations. It is to check this anomaly that this study sought to establish the requisite test construction template that will equip teachers and other stakeholders to be able to develop and validate, quality test items that possess the required psychometric properties in Financial Accounting.

Purpose of the Study

The purpose of this study was to develop and validate Financial Accounting Achievement Test (FAAT) for senior secondary schools in Rivers State. In specific terms, the study sought to:

1. Develop Financial Accounting Achievement Test (FAAT) for senior secondary school (2) students in Rivers State
2. Validate the developed test items in terms of content of the Financial Accounting Curriculum.
3. Conduct a trial-testing of the developed test items by administering to an even group.

4. Perform item analysis to determine the item difficulty, discrimination index and the effectiveness of distracters.
5. Determine the reliability coefficient of the test items.

Research Questions

The study was guided by the following research questions:

1. What Financial Accounting Achievement Test has been developed by the researcher?
2. To what extent are the developed items valid in terms of content of the Financial Accounting Curriculum?
3. What are the item difficulty, discrimination index and effectiveness of distracters of the test items?
4. What is the reliability coefficient of Financial Accounting Achievement Test (FAAT)?

METHODOLOGY

The instrumentation research design was adopted in the study as the study basically involved the development and validation of Financial Accounting Achievement Test (FAAT) for evaluating the cognitive achievement of senior secondary school (2) students in Financial Accounting. A sample of 219 Financial Accounting students were selected randomly and used to subject initial 50 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 were retained. The instrument used for data collection was the researcher-developed Financial Accounting Achievement Test (FAAT). Face and content validation of FAAT was ensured by constructing items in line with the test blue print, the use of subject experts in SS2 Financial Accounting and two experts in test construction. Thirty senior secondary two (SS2) Financial Accounting students was used for the pilot testing and to establish the reliability coefficient of the items. The test reliability established through Kuder Richardson formula 20 gave a coefficient of 0.81. The test was said to be valid and reliable.

RESULTS

Research Question 1: *What Financial Accounting Achievement Test has been developed by the researcher?*

See Appendix A.

Research Question 2: *To what extent are the developed items valid in terms of content of the Financial Accounting Curriculum?*

The draft FAAT was submitted to 30 experts in the field of Measurement and Evaluation, and the Financial Accounting teachers amongst the various senior secondary schools in Rivers State that were sampled, for detailed assessment as to prevent the proliferation of unnecessary test items. To establish content validity, a table of specification (test blueprint) was developed and used as a guide in constructing the items. The said table of specification was also made available to the Financial Accounting teachers for their validation. Table 1 displays the Table of Specification for the FAAT for SS2 in River State.

Table 1: Table of Specification for Financial Accounting Achievement Test in SS2

Contents	Behavioural Objectives						Total
	Know. 44%	Comp. 20%	Appl. 16%	Anal. 10%	Synth. 10%	Eval. 0%	
Contents of Financial Accounting (6%)	4	1	NA	1	NA	NA	6
Introduction to financial accounting (6%)	4	2	NA	NA	NA	NA	6
Accounting equation and double entry principles (10%)	4	2	2	2	N.A	N.A	10
Accounting concepts (8%)	3	2	2	N.A	1	N.A	8
Final Accounts of a sole trader/proprietorship (8%)	4	1	1	1	1	N.A	8
Provisions and Reserves (8%)	3	2	2	1	NA	NA	8
Manufacturing accounts (10%)	4	2	2	1	1	NA	10
Control accounts and self-balancing ledgers (10%)	4	2	1	NA	3	NA	10
Single entry and incomplete record (10%)	4	1	2	1	2	NA	10
Accounts of Not-for-profit/miscellaneous accounts (10%)	4	2	1	1	2	NA	10
Partnership/control accounts (6%)	3	1	2	NA	NA	NA	6
Accounting for value added tax (8%)	3	2	1	2	NA	NA	8
TOTAL	44	20	16	10	10	0	100

Note: NA = Not Applicable, while Know, Comp, Appl, Anal, Synth and Eval represent respectively Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation.

Research Questions 3: *What are the item difficulty, discrimination index and effectiveness of distracters of the test items?*

Table 2: Item Analysis Showing the Difficulty, Discriminating Index and Distracters.

S/No.	Items	Keys	Upper 27%	Lower 27%	Difficulty Index	Discriminating Index	Distracters
1	1	D	160	82	0.69	0.44	A, B and C
2	2	C	158	49	0.59	0.62	A, B and D
3	3	C	104	57	0.46	0.27	A, B and D
4	4	D	147	59	0.59	0.50	A, B and C
5	5	C	163	54	0.62	0.62	A, B and D
6	6	A	158	62	0.63	0.55	B, C and D
7	7	B	148	54	0.58	0.54	A, C and D
8	8	B	85	40	0.36	0.26	A, C and D
9	9	A	138	60	0.57	0.44	B, C and D
10	10	A	145	72	0.62	0.42	B, C and D
11	11	A	153	56	0.58	0.55	B, C and D
12	12	B	150	55	0.59	0.54	A, C and D
13	13	B	83	47	0.37	0.21	A, C and D
14	14	B	138	51	0.54	0.50	A, C and D
15	15	A	141	53	0.55	0.50	B, C and D
16	16	A	143	56	0.57	0.50	B, C and D
17	17	C	157	66	0.64	0.52	A, B and D
18	18	C	140	61	0.57	0.45	A, B and D
19	19	D	139	48	0.53	0.52	A, B and C
20	20	A	128	49	0.51	0.45	B, C and D
21	21	C	113	48	0.46	0.37	A, B and D
22	22	D	118	47	0.47	0.41	A, B and C
23	23	A	123	51	0.50	0.41	B, C and D
24	24	D	142	70	0.61	0.41	A, B and C
25	25	D	152	57	0.60	0.54	A, B and C
26	26	A	114	62	0.50	0.30	B, C and D
27	27	D	80	35	0.33	0.26	A, B and C
28	28	D	128	51	0.51	0.44	A, B and C
29	29	A	133	60	0.55	0.42	B, C and D
30	30	A	138	74	0.61	0.37	B, C and D
31	31	A	140	63	0.58	0.44	B, C and D
32	32	C	155	58	0.61	0.55	A, B and D

33	33	A	141	68	0.60	0.42	B, C and D
34	34	A	114	67	0.52	0.42	B, C and D
35	35	D	133	52	0.53	0.46	A, C and C
36	36	B	156	52	0.59	0.59	A, C and D
37	37	D	150	51	0.57	0.56	A, B and C
38	38	C	154	53	0.59	0.57	A, B and D
39	39	D	151	60	0.60	0.52	A, B and C
40	40	D	90	48	0.39	0.24	A, B and c
41	41	A	153	56	0.58	0.55	B, C and D
42	42	A	163	54	0.62	0.62	B, C and D
43	43	D	158	49	0.59	0.62	A, B and C
44	44	A	124	58	0.52	0.37	B, C and D
45	45	B	150	5	0.59	0.53	A, C and D
46	46	C	155	58	0.61	0.55	A, B and D
47	47	B	136	56	0.55	0.48	A, C and D
48	48	D	152	60	0.61	0.53	A, B and C
49	49	B	154	58	0.61	0.55	A, C and D
50	50	D	150	55	0.39	0.31	A, B and C

Table 2 shows the item difficulty and discrimination index of each of the items of the instrument. In terms of item difficulty, 45 items out of 50 items have item difficulty indexes ranging from 0.40 to 0.60 which satisfied the acceptable range, while 5 items fell within 0.33 to 0.37 which indicated that the items are not adequate for inclusion. In terms of item discrimination the 50 items have item discrimination ranges from 0.20 to 0.60 which also satisfied the acceptable range. All the 50 items distracted effectively.

Research Question 4: *What is the reliability coefficient of Financial Accounting Achievement Test (FAAT)?*

The reliability coefficient of the FAAT is 0.81 computed using Kuder Richardson Formula 20 (KR-20). This shows that the Financial Accounting Achievement Test developed is highly reliable, valid and as such useful.

Summary of Findings

1. A Financial Accounting Achievement Test containing 50 items was developed.
2. The developed test items met the criteria of content validity.
3. Forty five (45) items of the Financial Accounting Achievement Test have appropriate item difficulty indexes, 50 items have positive discrimination indices, and all the items distract effectively.
4. The developed Financial Accounting Achievement Test has a very high reliability coefficient of 0.81 using Kuder Richardson formula.

DISCUSSIONS

The results of the study show that 40 items out of 50 items have item difficulty indexes ranging from 0.40 to 0.60 which satisfied the acceptable range, while 11 items fell within 0.33 to 0.37 which indicated that the items are not ideal. In terms of item discrimination, 50 items have item discrimination indexes ranging from 0.20 to 0.60 which also satisfied the acceptable range. This implies that most of the items are ideal and are acceptable because they have appropriate difficulty indices and positive discrimination indexes. These results are similar to the findings by Obilor and Obubere (2020) who found in their study that 58 items out of 70 items have item difficulty indices ranging from 0.43 to 0.61. In terms of item discrimination, 70 items have item discrimination indices ranging from 0.21 to 0.62 which also which implied that most of the items are good and are acceptable. Item difficulty is simply the percentage of students who answer an item correctly. In this case, it is also equal to the item mean. In the opinion of Riaz (2008), item difficulty index ranges from 0 to 100; the higher the value, the easier the item (question). Item discrimination refers to the ability of an item to differentiate among students on the basis of how well they know the material being tested. Ideally, more testees in the upper group should get each item correct than those in the lower group, while effectiveness of distracters is one that attracts students with misconceptions or errors in thinking and reasoning, generally those with lower overall ability. It is expected that all the distracters in each item should operate effectively. This means that every distracter must be chosen by at least one person each from the upper and lower groups. Item selection implies where the number of items needed is selected. The items are to be first ranked in descending order based on the magnitude of their discriminating power. Those with zero and negative values should be rejected out rightly. In the case of item difficulty, there is no specific value to be selected, but it depends on the use of the test. Estimating the validity and reliability values of the test is the sixth step. In this step the researcher is to use any of the following methods: Validity: content, face, construct and criterion; Reliability: Test-Retest, Split-Half, Cronbach Alpha, Kuder Richardson, and Parallel Form. Timing and printing of the final form of the test is the last stage in test construction and should be done considering the age, sex, disposition, location and educational level of testees. Purpose of the test must be considered too when timing the test.

CONCLUSION

From the results obtained, the following conclusions were drawn:

1. The Financial Accounting Achievement Test (FAAT) was developed by the researcher.
2. The validated items were congruent with the Financial Accounting curriculum.
3. The developed and validated Financial Accounting Achievement Test exhibited a good measure of difficulty and discrimination indexes, and the items distracted effectively.
4. The Test has a high reliability coefficient of 0.81 computed using KR-20 method.

RECOMMENDATIONS

Based on the findings of the study, the following recommendations were made:

1. Financial Accounting Achievement Test should be developed and used by Financial Accounting teachers in senior secondary schools in Rivers State.
2. The test items of FAAT developed should serve as a template to develop other achievement tests in Financial Accounting for senior secondary schools in Rivers State.
3. Conduction of frequent seminars, conferences, workshop etc. should be carried out in order to acquaint teachers with techniques needed for development, construction of effective validation of test items.

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