

TABLE OF SPECIFICATION: ENSURING CONTENT VALIDITY OF TEACHER- MADE- TEST AMONG SENIOR SECONDARY SCHOOLS TEACHERS IN KWALI AREA COUNCIL

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Introduction

A *Table of Specifications* provides the teacher with evidence that a test has content validity, that it covers what should be covered. Table of specification is a two-way chart which describes the topics to be covered by a test and the number of items or points which will be associated with each topic. According to Kolawole (2010), it is a two way chart which maps instructional objectives with course or subject contents. Table specification is a plan prepared by a classroom teacher as a basis for test construction especially a periodic test. It therefore helps to ensure that there is a match between what is taught and what is tested. Classroom assessment should be driven by classroom teaching which itself is driven by course goals and objectives. The purpose of a *table of specifications* is to identify the achievement domains being measured and to ensure that a fair and representative sample of questions appear on the test. It thereby provides the link between teaching and testing (Alvares, 2013).

Tables of specifications can help students at all ability levels learn better. By providing the table to students during instruction, students can recognize the main ideas, key skills, and the relationships among concepts more easily. The table of specifications can act in the same way as a concept map to analyze content areas. Teachers can even collaborate with students on the construction of the table of specifications, what are the main ideas and topics, what emphasis should be placed on each topic, what should be on the test? Open discussion and negotiation of these issues can encourage higher levels of understanding while also modeling good learning and study skills. Therefore a marriage between teacher made tests and accountability should take place to insure validity of its offspring. Teachers who do not use conventional construction guidelines for test development will not be assessing student achievement well. Their tests will likely have poor content validity, "cause for concern because each assessment instrument depends on its validity more than on any other factor" (Notar, Zuclka, Wilson & Yunlar, 2004).

Content validity is concerned with content coverage of a test. The most widely method used in obtaining content valid test is through the construction

of table of specification otherwise known as test blue print. The table may also be referred to as the "master chart," "matrix of content and behaviors," "prescription," "recipe," "road map," "test specifications," or "formal specifications" (Bloom, Hastings & Madaus, 1971). Table of specification as a guide to establishing content validity have been in existence for a very long time in education. According to Idris, Ugochukwu, Olalere and Shehu (2016), the significance of validity as a psychometric property of test in research and evaluation can never be over emphasized. Invalid test instruments rather lead to invalid interpretations and conclusions in research and evaluation. Table of specification gives a detailed guide as a vital component for item development. It also showcased disadvantages of haphazard selection and writing test items for assessment and data generation.

For a test to be valid, it must measure what it is supposed to measure. If the instruments used for testing are inappropriate, the decision taken from the assessment will also be faulty and such an exercise will be in futility (Osunde, 2010). Content validity is the degree to which tests or questions adequately cover or samples the content (subject matter) of the work to be assessed. Validity is defined as what test measures and how well it does so (Anastasi & Urbina, 1997) and (Odiagbe, 2016). It is also seen as the degree to which evidence and theory support the interpretation of test scores (AERA, APA & NDCE, 1999). In the same way, Osunde (2010) viewed validity as the extent to which a test measures what is purported to measure. Content validity on the other hand is defined as the type of validity that addresses how well the items developed operational construct provide adequate and representative sample of all items that might measure the construct of interest (Idris et al, 2016).

Idris and Alfa (2012) defined content validity as the extent to which a test measures an intended content area. This simply indicates that content validity is all about how topics and sub topics are represented in a test instrument for the purpose of formative and summative evaluation. It is expected that learners or students should have mastery to certain level of all the content taught during instruction within which test items are selected in order to assess the level of the achievement of instructional objectives. Virtually, consistent achievement of instructional objectives leads to the overall achievement of the goals of syllabuses, curricula and above all national goals (Alvares, 2013).

Measuring students' performance is one of the most important aspects of teaching and learning. The uses of achievement tests include placement into a suitable class, promotion from one class to another and certification. Teacher –Made –Tests (TMT) is tests constructed by the teacher for the

purpose of evaluating his/her teaching techniques. They are classified as objective tests (structured response types) and essay types (free response types). The primary advantage of a *teacher-made test* is the ability of the teacher to design a customized test that matches the learning goals and content of the class. A teacher-made test is an alternative to a standardized test, written by the instructor in order to measure student comprehension. Teacher-made tests are considered most effective when they are implemented as part of the education process, rather than after the fact. Teacher-made tests are more than assessment devices: They are a fundamental part of the educational process. They can define instructional purposes, influence what students study, and help instructors to gain perspective on their courses. How well the tests accomplish these purposes is a function of their quality (Notar et al, 2004) and (Sarvia, 1987).

To ensure that a test has content validity, Bloom's taxonomy recommended that the test instructional objectives are stated under the following broad instructional objective headings namely knowledge, comprehension, application, analysis, synthesis and evaluation (Owie, 2010).

Table 1: Table of Specifications/Test Blue Print for Mathematics JSS1

S/N	Instructional Objective Contents	Knowledge 25%	Comprehensive 20%	Application 15%	Analysis 15%	Synthesis 15%	Evaluation 10%	Total 100 %
1	Fractions	3	3	1	1	1	1	10
2	Addition and Subtraction	3	2	2	1	1	1	10
3	Multiplication	3	2	1	2	1	1	10
4	Division	2	1	2	1	2	2	10
5	Money	2	2	1	2	2	1	10
6	Length	1	2	2	2	2	1	10
7	Capacity	2	3	1	2	1	1	10
8	Weight	2	2	2	2	2		10
9	Plane Shapes	3	2	2	1	1	1	10
10	Pictograms	4	1	1	1	2	1	10
	Total	25	20	15	15	15	10	100

The table of specification in the table has knowledge 25%, comprehension 20%, Application 15%, Analysis 15%, Synthesis 15% and Evaluation 10%. The moment instructional objectives have been identified, a test blue-print is developed linking both the content and behavioral objectives as shown in the table above. A table of specifications of this kind helps to ensure that the test has content validity in terms of covering all the objectives of instruction.

Bloom classified educational objectives of an intellectual nature (the cognitive domain) into six groups: these six forms a hierarchy of mental skills from the lowest and easiest level, knowledge, to the highest most difficult level, evaluation. When constructing an achievement test, therefore, some of the items should test each of these six groups of Knowledge, comprehension, application, analysis, synthesis and evaluation (Nwana, 2007 and Owie, 2006). The first two can be classified as low cognitive objectives, while the last four are the higher cognitive objectives (Nwana, 2007).

An achievement test should be measuring fully the status of the individual in all the hierarchical levels of learning as proposed in the Bloom's taxonomy of educational objectives. Construction of valid and reliable test in various subject areas has not been given enough attention in the senior secondary school in Nigeria. It is expected that the schools should have enough valid and reliable tests for assessing their students when they have covered the curriculum content areas as well as to prepare them for external examinations (Madu, Ihechu, Ukah & Ugochi, 2016). Test and examinations at all stages of education, especially at higher education have been considered an important and powerful tool for decision making in our competitive society, with people of all ages being evaluated with respect to their achievement, skills and abilities. We are in era of test conscious age and everything we do is greatly influenced by our performance in test.

The secondary education is made up of the upper basic education (JSS 1 – 3) and senior secondary school level (SSS 1-3), the underlying philosophy of the SSS was to ensure that every senior secondary school graduate is well prepared for higher education. For the purpose of preparing the students for public examinations such as West Africa School Certificate (WASC), National School Certificate (NSC) and National Business and Technical Examination Certificate (NABTEC), the students need to be exposed to test with content validity. It is therefore the desire of the researcher to find out from the senior secondary school teachers, there level of awareness and exposure to the use of table of specification in constructing tests items for students in Kwali Area Council.

Three research questions have been raised to guide this study.

1. What is the level of awareness of the use of table of specification among SSS teachers in Kwali Area Council?
2. To what extent are the teachers conversant with the procedures of constructing table of specification?
3. To what extent are the SSS teachers using table of specification in Kwali Area Council?

Method

Descriptive survey research design was adopted for this study. The population of this study consisted of all teachers from the five (5) senior secondary schools in Kwali Area Council. The sample of 20 teachers per school was randomly selected from the five schools making a total of 100 teachers that were used for the study. The research instrument used for this study is teachers' questionnaire developed by the researcher. The instrument contains two sections: A and B, section A asks questions on personal and school information while section B asks questions on (1) awareness of table of specification (2) familiarity with the procedures of construction (3) utilisation of table of specification. The 16 items instrument was designed in four point scale; Strongly Agreed (SA), Agree (A), Disagree (D) and Strongly Disagree (SD). The instrument was validated by experts in measurement and evaluation and a Cronbach Alpha reliability coefficient of 0.86 was obtained by using the Special Package for Social Science (SPSS). The instrument was administered by the researcher in the five schools. The completed questionnaires were collected after one week. The data were analyzed using frequency count, percentage, mean, and standard deviation. A mean of 2.5 is taken as the average. Any mean less than 2.5 is taken as disagreed with the item while any mean higher than 2.5 agreed with the items.

Results

Table 2: Level of Awareness of the use of Table of Specification among SSS Teachers in Kwali Area Council

S/N	Items	On	SA	A	D	SD	N	Mean Value	SD	Remark
1.	I am aware that table of specification should be used for test construction		7	27	36	30	100	1.92	0.91	Disagreed

2.	The school mgt have informed me about the use of table of specification	3	5	54	38	100	1.74	0.72	Disagreed
3.	This is my first time to hear of table of specification	27	57	10	6	100	3.01	0.78	Agreed
4.	Use of table of specification is not relevant in test construction	37	45	9	9	100	1.94	0.93	Disagreed

Table 2 revealed that item 1 has a mean of 1.92 which is less than the average value of 2.5 and standard deviation of 0.91, it therefore means that most of the respondents disagreed that they were aware that table of specification should be used for test construction. Item 2 have a mean of 1.74 which is less than the average value of 2.5 and standard deviation of 0.72, it therefore means that most of the respondents disagreed that school management have informed the teachers to use of table of specification for test construction. Item 3 has a mean of 3.01 and a standard deviation of 0.78 which mean that the respondent agreed that this was the first time they hear of the use of table of specification. Similarly, item 4 have a mean of 1.94 and standard deviation of 0.93.

Table 3: The Extent of Teachers’ Conversance with the Procedures of Constructing Table of Specification

S/N	Items familiarity	On	SA	A	D	SD	N	Mean Value	SD	Remarks
5	I am familiar with table of specification	9	5	28	58	100	1.73	0.93	Disagreed	
6	I do not know how to construct table of specification	40	49	5	6	100	3.22	0.78	Agreed	
7	The school management have taught me about the use of table of specification in test development.	-	-	36	64	100	1.36	0.48	Disagreed	

8	Table of specification ensure all topics are sampled.	28	27	36	9	100	2.71	0.96	Agreed
9	I use table of specification for my test construction	18	7	38	37	100	2.01	0.91	Disagreed
10	I got confused, so i decided to stop using it.	38	31	15	16	100	2.91	1.21	Agreed

Table 3 revealed that item 5 has a mean of 1.73 which is less than the acceptable value of 2.5 and standard deviation of 0.93, it therefore means that most of the respondents disagreed that they were familiar that table of specification should be used for test construction. Item 6 have a mean of 3.22 which is higher than the acceptable value of 2.5 and standard deviation of 0.78, it therefore means that most of the respondents agreed that they do not know how to construct table of specification for test construction. Item 7 has a mean of 1.36 and a standard deviation of 0.48 which mean that the respondents disagreed that the school management have taught them about the use of table of specification in test development. Similarly, item 8 have a mean of 2.71 and standard deviation of 0.96. Item 9 have a mean 2.5 and standard deviation of 0.91

Table 4: The Extent of Utilisation of Table of Specification by Senior Secondary School Teachers is in Kwali Area Council.

S/N	Items on Utilisation	SA	A	D	SD	N	Mean Value	SD	Remarks
11.	The school mgt ensure we use table of specification	3	16	22	59	100	1.63	0.86	Disagreed
12.	I construct my tests items without using table of specification	55	18	9	18	100	3.14	1.10	Agreed
13.	I do not know how to use it.	9	18	27	46	100	3.10	1.00	Agreed
14.	I have never seen a fellow teachers use table of specification	29	37	16	18	100	2.82	1.02	Agreed
15.	Table of specification ensure content validity	28	36	36	-	100	2.90	0.81	Agreed

16.	The construction of table of specification for items generation is time consuming.	20	44	36	-	100	2.82	0.72	Agreed
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Table 4 revealed that item 11 have a mean of 1.63 which is less than the acceptable value of 2.5 and standard deviation of 0.86, it therefore means that most of the respondents disagreed that the school management ensure we use table of specification. Item 12 have a mean of 3.14 which is higher than the acceptable value of 2.5 and standard deviation of 1.10, it therefore means that most of the respondents agreed that they construct tests items without using table of specification. Item 13 have a mean of 3.10 and a standard deviation of 1.00 which mean that the respondents agreed that they do not know how to use of table of specification in test development. Similarly, item 14 have a mean of 2.82 and standard deviation of 1.00. Item 15 have a mean 2.90 and standard deviation of 0.81. Item 16 have mean of 2.82 and standard deviation of 0.72 which means the respondents agreed that the construction of table of specification for items generation is time consuming.

Discussion

The findings on research question one revealed a very low level of awareness among the teachers as most of the respondents were not aware that that table of specification should be used for test construction. In a similar manner, most of the respondents disagreed that school management have informed them to use table of specification for test construction according to them, this was the first time they were hearing of the use of table of specification. The teachers also disagree that the use of table of specification is not relevant in test construction. The findings of this study are in agreement with studies carried out by Idris e tal (2016) and Odiagbe (2016).

The finding on research question two revealed that the teachers were not familiar with the construction of table of specification for test construction. They do not know how to construct table of specification for test construction and the school management have never taught them about the use of table of specification in test development, this could be attributed to the reason teachers are not using the table of specification. The teachers however agreed that table of specification ensure all topics are sampled in the achievement tests. The findings of this study are in agreement with studies carried out by Alvares (2013) and Idris and Alfa (2012) who in their various studies simply indicated that content validity is all about how topics and sub topics are represented in a test instrument for the purpose of formative and summative

evaluation. Virtually, consistent achievement of instructional objectives leads to the overall achievement of the goals of syllabuses, curricula and above all national goals

The finding on this research question three revealed that the teachers in the senior secondary school in Kwali Area Council are not utilising table of specification and that the school management have never ensured that the table of specification is use. That they construct tests items without using table of specification. They do not know how to use of table of specification in test development. Similarly, respondents agreed that the construction of table of specification for items generation is time consuming. The findings of this study are in agreement with study carried out by Notar etal (2004) who opined that teachers who do not use conventional construction guidelines for test development will not be assessing student achievement well. Their tests will likely have poor content validity, this cause for concern because each assessment instrument depends on its validity more than on any other factor.

Conclusion

Table of specification is obviously a major process to ensure a valid instrument. A table of specifications helps to ensure that there is a match between what is taught and what is tested. Fundamentally, classroom assessment should be driven by classroom teaching which itself is driven by course goals and objectives. Teacher-made tests are considered most effective when they are implemented as part of the education process. Teacher-made tests are more than assessment devices. They can define instructional purposes, influence what students study, and help instructors to gain perspective on their courses.

Recommendations

From the findings, the following recommendations have been made:

1. Seminars should be organised by the authority concerned to sensitize and expose teachers to the theory and concepts of table of specification.
2. Teachers should learn how to construct table of specification and made use of it when developing test items.
3. The authority of secondary schools should ensure that subject teachers make use of table of specification when developing test items.
4. Measurement and evaluation experts should be employed in the schools to guide teachers on test constructions.

References

- Anastasi, A and Urbina, S. (1997). Psychology Testing. Seventh Edition. Upper Saddle River Prentice Hall.
- Alvares, K.K.(2013). Table of Specification and Test Construction. Retrieved from www.katekimberlyalvares/table of specification on 29th March, 2017.
- Idris, U.S.B. and Alfa, A.M. (2012). Test and Measurement. Unpublished EDU321 Coursework, FUT, Minna.
- Idris, U.S.B; Ugochukwu, E.M; Olalere, A.M and Shehu, H. (2016). Procedures for Improving Content Validity of Teacher-Made- Test: Way forward to Ensuring Quality Research and Evaluation. Paper Presented at the 18th Annual National Conference by ASSEREN held in Owerri, (11 – 15 July, 2016).
- Kolawole, E.B. (2010). Principle of test construction and administration. Lagos: Bolabay Publications.
- Madu, A.U; Ihechu, K.S.P. Ukah, P and Ugochi, A.F. (2016). Development and Validation of an Achievement Test in Agricultural Science for SSS in Imo State. Paper Presented at the 18th Annual National Conference by ASSEREN held in Owerri, (11 – 15 July, 2016).
- Nwana, O.C. (2007), Textbook on Educational Measurement and Evaluation. Boma way Publisher, Owerri –Nigeria.
- Notar, C.E; Zuclka, D.C; Wilson, J.D; and Yunlar, B.D. (2004). The table of specification: Insuring Accountability in Teacher- Made- Tests. Retrieved on 29th March, 2017
- Odiagbe, S.I. (2016). Determining the Items Difficulty and discrimination index of Mathematics Achievement Tests from Junior Secondary Schools in Kwali Area Council. Paper Presented at the 18th Annual National Conference by ASSEREN held in Owerri, (11–15 July, 2016).
- Osunde, A.U. (2010) Advanced Educational Evaluation: EPC923 [Lecture notes] Benin City, Nigeria: University of Benin, Department of Educational Psychology Curriculum Studies.
- Owie, I. (2006) Measurement and Evaluation in the Classroom. United City Publishing Company. Benin City.
- Scarvia, B.A. (1987). The Role of the Teacher-Made- Test in higher education. [www. Teacher-Made- Test /](http://www.teacher-made-test.com) on 29th March, 2017.
- Seid, S. (2013). Teacher-Made- Test. [www.slide](http://www.slide.net) share. Net seid suliaman. Teacher-Made- Test/ on 29th March, 2017.