Transforming Teacher Made Economics Tests Construction in Kano State Secondary School to Global Level of Relevance and Competitiveness

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Abstract: Teacher Made Tests (TMT) over the years have been challenged by having some deficiencies in the critical qualities of a good test. Students at various levels of education were found to be performing wonderfully in Teacher-Made Tests. However, these students in most cases are incapable of passing standardized achievement tests such as Senior Secondary School Examinations organized by West African Examination Council (WAEC) or National Examination Council (NECO). This study evaluated Teacher Made Economics Tests (TMETs) in Kano State Senior Secondary Schools to find out the logical validity of tests. It specifically compared the cognitive objectives tested (observed) by TMETs with that of the National Curriculum (expected). The study also investigated teacher qualification differences in the logical validity of the Teacher-Made Economics Tests. The study employed an ex-post-facto design in the conduct of the research. Five hundred and seven (507) sampled TMTs from 169 Economics teachers were collected and evaluated using the table of specification constructed by the researcher. One sample t-test and ANOVA were used to test the hypotheses of the study. The findings of the study revealed a significant difference between the objective sampled in the TMETs and the cognitive objectives prescribed by the national curriculum, which indicates low logical validity. It also shows a significant difference between the teachers in various categories of qualification in ensuring logical validity in their TMETs. Finally, the study recommends among others the construction and use of a table of specification before planning any instruction and test construction.

Keywords: Teacher-Made Test, logical validity, Teacher Qualification, Transformation

1. INTRODUCTION

The education sector from time immemorial has been the only industry that serves as a source of every productive labor force of an economy. It sets the productive and technological bases which serve as the prime mover of the real economy. It is also the bedrock for necessary managerial, instructional and structural changes that guarantee rapid and sustainable growth for a conducive acceptable minimum standard of living.

Odia and Omofonmwan (2007) argue that successful development entails more than investing in physical capital, or closing the gap in the capital. It also entails acquiring and using knowledge as well as closing the gaps in knowledge. Thus, to successfully confront the challenges of development, a developing country must undertake three major tasks:

1. Acquire and adapt global knowledge and create knowledge locally.

2. Invest in human capital to increase the ability to absorb and use knowledge; and

3. Invest in technologies to facilitate both acquisition and the absorption of knowledge.

The utility of education has been described in many policies of the Nigerian government. For instance, the recent Federal Government reform program titled "National Economic Empowerment and Development Strategy (NEEDS) affirmed that education is a vital transformational tool and a formidable instrument for socio-economic development.

The Transformation Agenda (TA), which was launched by the Federal Government of Nigeria to cover the period from 2011–2015, draws its inspiration from the Millennium Development Goals (MDGs); Vision 20:20; and the first National Implementation Plan (NIP) of 2010-2013. TA was based on a set of priority policies and programmes to transform the Nigerian economy to

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meet the needs of the present generation while the future needs of the Nigerian people are not jeopardized. There is no doubt that investing in human capital development ensures the nation's human resource endowment and enables the optimal exploitation and utilization of other resources for productive growth and development. Priority policies for the development of education under the TA include:

1. Promotion of primary enrolment of all children of school going age irrespective of the income profile of the parents.

2. Provision of infrastructures such as classrooms across all levels of education to ease over-crowding, increase access, and reduction of pupils'/teacher ratio.

3. Enhancing the efficiency, resourcefulness, and competence of teachers *via* training, capacity building, and motivation.

In the context of modern education and continuous assessment, teacher-made tests have remained an integral and necessary part of teaching. Learning can no longer be avoided in the course of assessing the learning outcomes, and it remains the main assessment instrument at all levels of education except in the terminal points of education. The transformation of the Nigerian educational sector to the global level of relevance and competitiveness is highly incomplete, without transforming the teacher made test construction in Nigerian secondary schools.

According to Anastasi (1990), a test is necessarily an objective and standardized measure of a sample of human behavior. Objectivity means that theoretically how the test is scored and how the scores are interpreted are based on objective criteria not subjective decision. Skills in the cognitive domain revolve around knowledge, comprehension, and critical thinking on a particular topic. There are six levels in the cognitive domain of Bloom's taxonomy, moving through the lowest order processes to the highest, and are explained below (Bloom, 1956, Lorin & Krathwohl, 2001):

a. Remembering: Remembering represents the lowest level of learning outcomes in the cognitive domain. It exhibits memory of previously-learned materials by recalling facts, terms and basic concepts. *Tell*, *list*, *define*, *identify*, *level*, *match*, *outline*, *describe*, *relate*, *locate*, *write*, *find*, *state*, and *name* are some of the useful words/verbs in testing knowledge.

b. Understanding: is defined as the ability to grasp the meaning of material. These learning outcomes go beyond the simple 'remembers material' to 'understands facts and principles, interprets verbal material, interprets charts and graphs, translates verbal material to mathematical formulas', and 'estimates future consequences implied in data'. Useful words include *explain*, *interpret*, *outline*, *discuss*, *distinguish*, *predict*, *convert*, *defend*, *extend*, *generalize*, *give an example*, *infer*, *restate*, *translate*, *compare*, *describe*, etc.

c. Applying: applying refers to the ability to use learned material in a concrete situation. This may include the application of such things as rules, methods, concepts, principles, laws, and theories. Learning outcomes in this area require solving problems to new situations by differently applying acquired knowledge, facts, techniques and rules. Relevant words such as: *solve*, *show*, *use*, *illustrate*, *construct*, *complete*, *examine*, *classify*, *change*, *compute*, *discover*, *manipulate*, m*odify operate*, *predict*, *prepare* are among the useful words in testing application. Learning outcomes in this area require a higher level of understanding than those under comprehension.

d. Analyzing: This is the ability to break down material into parts so that its organizational structure may be understood. This may include the identification of the parts, analysis of the relationships between parts and recognition of the organizational principles involved. Learning outcomes here represent a higher intellectual level. Useful words are appraised, *break down*, *diagram*, *illustrate*, *infer*, *outline*, *pinpoint*, *subdivide*, *separate*, *select*, *compare*, *contrast*, *criticize*, *differentiate*, *discriminate*, *distinguish*, *examine*, *experiment*, *question*, *test*, etc.

e. Evaluating: is concerned with the ability to judge the value of material (statement, novel, poem, research report) for a given purpose. The judgment is to be based on definite criteria. Learning outcomes in this area are highest in the cognitive hierarchy because they contain elements of all of the other categories, plus conscious value judgments based on clearly defined criteria. Useful words include: *judge*, *select*, *choose*, *decide*, *justify*, *debate*, *verify*, *argue*, *recommend*, *assess*, *discuss*, *rate*, *prioritize*, *conclude*, *criticize*, *interpret*, *support* and so forth.

f. Creating: this refers to the ability to put parts together to form a new whole. Compiling information together in a different way by combining elements in a new pattern or proposing alternative solutions, production of a

unique communication, production of a plan, or proposed set of operations, useful words include: *assemble*, *categorize*, *combine*, *compile*, *compose, create, devise, generate, reorganize, construct, create, design, develop, formulate* and so forth.

Obimba (1989) and Kpodo (1997) have rightly observed that validity is the most important criterion for evaluating an assessment instrument. Even though no test can be 100 percent valid, the measure of the validity of a test enables us to judge whether the test measures to a reasonable degree the things it claims to measure. No test is completely valid or totally invalid. The test result may, for instance, have low, moderate, or high validity. There are mainly two approaches to find the validity of a test; logical validity and empirical validity (Sidhu, 2005).

Logical validity of a test is established when the test items are thoroughly examined and found to measure the skill, knowledge and understanding that the test intends to measure about certain course content and instructional objectives. For instance, when you say "I want to measure X" you must have in mind a particular reason for measuring 'X' which is the objective of the test.

Logical validity *is determined by first determining curriculum objectives.* The objectives could be cognitive, psychomotor or effective. If cognitive for instance, it could be remembering, understanding, applying, analyzing, evaluating or creating. Therefore, *determine the objective measured by each test item* and then *compare the objectives of the test with the objectives of the curriculum*. If most of the test items fall within the boundaries of the curriculum objectives, then it seems clear that the test shows evidence of logical validity. Furthermore, if test items deal with few portions of the curriculum objectives, the test seems to show less or no evidence of logical validity.

In essence, transforming teacher made test construction entails ensuring that the ethical principles of test construction are religiously observed for a test to be valid. As it was stated above, the logical validity is the most crucial aspect of teacher-made construction because it entails covering the curriculum objectives in the test. When a teacher sets test objectives outside of the curriculum objectives, this is clear evidence indicating that they had not taught the students at the level of the curriculum objectives, thereby automatically defeating curriculum objectives as well as national educational goals.

2. STATEMENT OF THE PROBLEM

In preparing a test, the teacher needs to have a clear conception of how the test, together with the test results are to be used and this requires prior specification of instructional objectives and decisions regarding the sequence and method of instruction. It is regrettable that empirical literature in Nigeria (Tajordeen 2000 and Yusuf 2007) has revealed that most teachers in the school system do not possess enough competence in test construction and validation. The Kano State teachers are not an exception of this handicap, as 50% of Kano State teachers were found to construct small test items, and only 24% of the teacher made tests were found reliable (Yusuf, 2007).

An excellent and valid teacher made test must proportionately sample the cognitive domain of the curriculum to accommodate the different capabilities of students. If the objective of the curriculum, for instance, was set at *remembrance* level, for the test to have proportionately sampled the curriculum objective, it must be set/developed to test *remembering*. This study investigated the logical validity of Teacher-Made Economics Tests (TMETs) used in Kano State Senior Secondary Schools.

3. OBJECTIVES OF THE STUDY

The study was primarily designed to find the logical validity of Teacher-Made Economics Tests (TMETs) used in Kano State. Other specific objectives included:

1. To find out the extent to which the Teacher Made Economics Test items proportionately sampled the cognitive domain of the curriculum.

2. To find out if there is teacher qualification difference in the logical validity of the Teacher-Made Economics Tests.

4. RESEARCH QUESTIONS

The study answered the following research questions

1. To what extent do the Teacher Made Economics Test items proportionately sample the cognitive domain of the curriculum?

2. Is there any Economics teacher qualification difference in the proportionately sampling cognitive domain of the curriculum in the Teacher-Made Economics Tests?

5. HYPOTHESES

The research tested the following hypotheses:

HO_1.

There is no significant difference between the proportionate objectives in the curriculum and the proportionate objectives sampled by the Teacher-Made Economics Tests (TMETs).

HO$_2$.

There is no significant Economics teacher qualification difference in proportionately sampling the cognitive domain of the curriculum in the Teacher-Made Economics Tests.

6. METHODOLOGY

The study employed an ex-facto design in the conduct of the research. Kerlinger (1970) defined ex-post facto research design as that in which the independent variable or variables have already occurred and in which the researcher starts with observation of the dependent variable or variables. The principal advantage of this research design is that it meets an essential need of the researcher where the more rigorous experimental approach is not possible and particularly appropriate when simple cause-effect relationships are being explored. However, it is limited to the problem of one not knowing for sure whether the causative factor has been included or even identified. It may be that no single factor is the cause.

There are 301 Economics teachers in Kano state senior secondary schools (KERD, 2013). A sample of 169 Economics teachers drawn on the basis of the advice given by Kreycie and Morgan (1975) was randomly selected across the thirteen educational zones in Kano State, using a proportionately stratified probability sampling technique, and within every stratum a simple random sampling (hat & draw) was used to select the proportionate percentage. The study evaluated a sample of teacher-made Economics tests (first, second and third term) from the state-own Senior Secondary School class (SS I) constructed in 2011/2012 academic session. A total of five hundred and seven (3×169 = 507) sampled TMTs from 169 Economics teachers were collected and evaluated using the table of specification constructed by the researcher.

The validity of the data collection instrument has not been reported since the researcher did not use any data collection instrument. Likewise no reliability of the data collection instrument was reported. The levels of the cognitive objectives of the curriculum were first determined with the aid of a table of the specification, and they are called expected cognitive objectives. Secondly, the test objectives were also determined, and these were called observed cognitive objectives. Finally, the expected cognitive objectives were compared with observed cognitive objectives and employed both the descriptive and inferential statistics. Table and simple percentage were used to present teachers' qualifications. While mean, one sample t-test and one-way ANOVA were used to test the hypotheses.

7. DATA PRESENTATION AND ANALYSIS

Table 1. Teachers' qualifications frequency table n=169

No:	Qualification	Freq	%	Cumm. %
1	NCE, B.Ed, PGDE, M.Ed	118	69.82	69.82
2	B.A/B.Sc, M.A/M.Sc	34	20.12	89.94
3	OND/HND	17	10.06	100
	T0TAL	169	100	

The table above (Table 1) indicated that 69.82% of the teachers sampled by the study were NCE, B.Ed, PGDE, M.Ed holders. While, 20.12% had graduated with B.A/B.Sc, M.A/M.Sc certificates. Whereas, only 10.06% of the sampled teachers obtained a post-graduate certificate in OND/HND level, and this suggests that the majority of the TMETs evaluated and analyzed were from NCE, B.Ed, PGDE, M.Ed holders.

The table below (Table 2) presents the descriptive statistics of the data collected. It compares the observed and expected mean of remembering, understanding, applying, analyzing, evaluating and creating as well as total cognitive.

Table 2. Descriptive Statistics Comparing Observed and Expected Domains

Cog. Obj.	%	Mean	St. Dev
Observ. Rem	75.54	6.8	3.152
Expect. Rem	100	9	0
Observ. Unders.	28.08	4.51	2.242
Expect. Unders.	100	18	0
Observ. App.	12.82	0.082	0.737
Expect. App.	100	6	0
Observ. Ana.	4.73	0.05	0.213
Expect. Ana.	100	1	0
Observ. Eva.	7.89	0.24	0.453
Expect. Eva.	100	3	0
Observ. Cre.	0.00	0.02	0.132
Expect. Cre.	100	0	0
Tot Cog. Observ.	44.40	12.43	3.295
Tot. Cog. Expect.	169	37	0

It can be seen from Table 2 above that each level of cognitive objective has been observed and expected. The observed are cognitive levels sampled by TMETs evaluated; while, the expected are the planned levels of cognitive objectives from the curriculum. One can understand that remembering amd understanding have the highest mean and standard deviation for the observed and expected level of cognitive objectives. This means that most of the demand of the curriculum is at a lower level of the cognitive domain. For instance, when the *remembering* and *understanding* percentages and means for expected objectives stood at 9.00 and 18.00, the normal mean for *applying*, *analyzing*, *evaluating*, and *creating* were 6.00, 1.00, 0.00 and 3.00 respectively. Reading from Table 2, expected percentages for *understanding*, *applying*, *analyzing*, *evaluating* and *creating* were 28.08%, 12.82%, 4.73%, 7.89% and 0.00% respectively. This suggests a significant difference between the proportionate objectives in the curriculum and the proportionate objectives sampled by the TMETs. Therefore, we cannot accept hypothesis **HO₁:** - *There is no significant difference between the proportionate objectives in the curriculum and the proportionate objectives sampled by the TMETs.*

Table 3. One-Sample t-test analysis for Observed and Expected cognitive objectives

Cog. Obj.	S.E. Men	Mean Diff	T	Df	Sign
Obs.Remem.	0.242	-2.201	-9.078	168	.000
Exp. Remem.		0			
Obs. Unders.	0.0172	-13.485	-78.2	168	.000
Expe. Unde	0				
Obs.App.	0.057	-5.183	-91.4	168	.000
Exp. App.	0				
Obs.Ana.	0.016	-0.953	-58.15	168	.000
Exp. Ana.	0				
Obs. Eva	0.01	0.018	1.742	168	.000
Expe Eva.	0				
Obs. Crea.	0.035	0.018	1.742	168	.083
Exp. Creat.	0				
Total cog. Obs.	0.253	-24.568	-98.94	168	.000
Total cog. Exp.	0				

n= 169

Table 3 above compared the observed and expected objectives: *remembering*, *understanding*, *applying*, *analyzing*, *evaluating* and *creating*. It also compared the total cognitive objectives and total cognitive expected. The table also presented the means, standard deviations, the standard error means, means differences and the calculate t – value, of both the observed and expected *remembering*, *understanding*, *applying*, *analyzing*, *evaluating* and *creating* and the total cognitive objectives.

The t- value as we can see from Table 3 for *remembering*, *understanding*, *applying*, *analyzing*, *evaluating* and total cognitive were all significant for two-tail at 0.05 level of significance. Thus, the null hypothesis is at this moment rejected.

HO₂. *There is no significant Economics teacher qualification difference in proportionately sampling cognitive domain of the curriculum in the Teacher-Made Economics Tests.*

This hypothesis was designed to find out whether teachers' qualifications have any impact in determining what cognitive objectives could be sampled by the TMETs items. Table 4 presents the one-way ANOVA on the effect of teachers' qualification in sampling the curriculum objectives in TMETs.

Table 4. One-way ANOVA for Teachers Qualification and Observed cognitive objectives

Cognitive Domain	Sum of Squares	Df	Mean Square	F	Sig.

Table 5. One-way ANOVA for Tea. Qual. and Obs. Cog. Obj.

Cog.Domain	Sum of Squares	Df	Mean Square	F	Sig.
Obs. Rem.					
Betw Grp	2.397	1	2.397	0.24	0.625
Wit. Grp.	1666.763	167	9.981		
Total	1669.16	168			
Obs. Und.					
Betw. Grp.	8.212	1	8.212	1.64	0.202
Wit. Grp.	836.001	167	5.006		
Total	844.213	168			
Obs. App.					
Bet. Grp	0.002	1	0.002	0.004	0.95
Wit. Grp	91.311	167	0.547		
Total	91.314	168			

Obs. Ana.						
Betw Grp	0.007	1	0.007	0.145	0.703
Wit. Grp	7.615	167	0.046		
Total	7.621	168			
Obs. Eva.						
Betw. Grp	0.178	1	0.178	0.865	0.354
Wit.Grp	34.355	167	0.206		
Total	34.533	168			
Obs. Cre.						
Betw. Grp	0.031	1	0.031	1.766	0.186
Wit. Grp	2.916	167	0.017		
Total	2.947	168			
Obs. Cog.						
Betw Grp	21.387	1	21.387	1.982	0.161
9I Wit. Grp.	1802.08	167	10.791		
Total	1823.467	168			

n= 169

The f- values of the individual cognitive domain Viz; Understanding, Creating, Evaluating and total observed (f-value 1.64, 1.766, 0.867 & 1.928) as we can see from the table above were all significantly different at 0.05 level of significance. As such, the null hypothesis which stated that there is no significant Economics teacher qualification difference in proportionately sampling cognitive domain of the curriculum in the Teacher-Made Economics Tests (TMETs) is at this moment rejected. This implies that teachers differ in sampling curriculum objectives in their TMETs by their level of qualifications in Kano State Senior Secondary Schools.

8. Discussion of the Findings

The inability of the Kano State Economics teachers-who constructed the TMETs and who were evaluated in this study- to proportionately sample the cognitive objectives in their TMETs, indicates that the curriculum objectives could not be achieved and once curriculum objectives are defeated, educational objectives are also defeated at the national curriculum level. Such objetives are in line with the findings of a study by Nwagu (1996), in which the quality of teacher-made tests was investigated through studying Content Validity of Teacher-Made Geography Tests Used in Secondary Schools in Anambra and the Enugu States of Nigeria, and in which the tests were found to be poor.

The current low level in students' academic performance in the Nigerian school system may be linked with the deviation of the teachers to sample the right curriculum cognitive objectives in their teacher-made tests. Therefore, these major roles of education could not be attained if the right curriculum is not sampled in the teacher-made test. This study is similar to the findings of Yusuf (2007) who evaluated the quality of teacher-made tests in senior secondary schools in Jigawa and Kano states of Nigeria.

The gap between theory and practice in the Nigerian educational system is another problem militating against the development of the educational system in Nigeria, which could be associated with current practices of the teachers' inability to sample the proportionate curriculum cognitive objectives in teacher-made tests. This study indicated that the gap between theory and practice would continue to hinder the required growth and development of the educational system in Nigeria. This is what Ezugwu (1999) stresses in a study of the validity of teacher-made physical education, tests constructed by teachers with varying experience and qualifications in Secondary Schools in Enugu State. From the findings of this study, one can also rightly argue that the effort of transforming the Nigerian educational sector to the global level of relevance and competitiveness cannot be completed if the teacher does not evaluate students' performance as prescribed by the national curriculum.

9. Conclusion

Based on the data collected, analyzed and interpreted, the study concludes that the TMETs constructed in 2011/2012 academic session were not in proportion with the cognitive objectives prescribed in the Senior Secondary Schools National Curriculum and as such these TMETs have low logical validity.

The study, also concludes that Kano State teachers who constructed the Teacher-Made Economics Tests in 2011/2012 academic session SS I sampled different cognitive objectives due to differences in their qualifications.

10. Recommendations

The following recommendations were proffered by the findings of this study to adequately transform Teacher-Made Economics Tests in Kano state and Nigeria in general to the global level of relevance and competitiveness:

i) The state's ministry of Education in conjunction with Kano State Educational Resource Department (KERD) should issue a circular that mandates all teachers to construct tables of specifications as a guide for planning any instructional activity. Heads of Departments should ensure that all teachers strictly abide by the circular.

ii) Kano State Ministry of Education and KERD should collaborate with the departments of education in organizing workshops or seminars to train and re-train the Kano State Economics teachers.

iii) In the course of collecting the TMETs evaluated in this study, it has been observed with utmost interest that the current schemes of work used by Kano State teachers do not contain the stated objectives of the national curriculum and most of the teachers wholly depend on it when planning their instructional activities and test construction. This study, therefore, recommends that Kano State Ministry of Education should give an immediate directive for the withdrawal of the scheme of work used in Kano Senior Secondary Schools and instead replace it with the scheme of work which contains the curriculum objectives.

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