Assessing Teacher Competence in Test Construction and Content Validity of Teacher Made Examination Questions in Commerce in Borno State, Nigeria

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Abstract   This study assessed the relationship between commerce teachers' competence in test construction and test quality. The objective was to assess the areas of competence of Borno State Senior Secondary Schools Teachers of commerce in constructing examination questions. Two research questions were answered and one null hypothesis tested. The population of the study was 75 teachers of commerce in senior secondary schools in Borno State. A 42-itemquestionnaire named "Teachers Competence Questionnaire" (TECOM-Q) was administered to the sampled teachers. The reliability coefficient of 0.816 was established for the instrument through Cronbach's alpha. Frequency counts, percentages, mean and standard deviations were computed and Contingency coefficient was used to test whether there was significant relationship between teachers of commerce competence and content validity of their examination questions. The result of the analysis showed that there were significant relationships between teachers of commerce competence and content validity, the areas of teachers' competence in constructing examination questions was low. It was found that teachers concentrated on the lower levels of the cognitive domain (remembering, understanding applying. The study recommended workshops and seminars to improve teachers' competence in test construction.

Keywords   Teacher Competence, Content Validity, Teacher-Made Examination

1. Introduction

Test construction competence and quality are essential tools required by any teacher if teaching and learning goals are to be achieved. The significance of tests in a school system is bountiful since it is the means by which any meaningful educational goals are attained. The potency of learning objectives, embedded in a school curricula remain the most cardinal sign post for educational growth, institutional excellence and individual aspirations. Teachers who are custodians of knowledge must be seen to be competent in measuring learning goals with precision and accuracy. Similarly, the tools with which these learning goals are measured must also be precise and accurate to be able to measure what the teacher intends to measure and evaluate. These cannot be possible without teachers themselves being competent in the art and science of handling the tools; which are the tests and examinations (D'Agostino, 2007).

Over the last few decades, there was a great employment of untrained and unqualified teachers into the teaching profession in Nigerian schools system. Teaching became a means to an end for many as such it was used as a stepping stone to greener pasture. The consequence of which was the influx of incompetent teachers in the schools' system thereby resulting to persistent student failure in public examinations (Hamafyelto, 2008). This assertion was supported by a study conducted on competence of teachers of commerce in private senior secondary schools in Maiduguri Metropolis. It was reported in this study that majority of the teachers held B. Sc. Economics, B. Sc. Accountancy, B. Sc. Mathematics, B. Sc. Geography and B. Sc. Business Management (Hamafyelto, 2008). This was an abrasion to the provisions and guidelines for employment of teachers in our schools.

2. Teacher Competence in Constructing Tests

Teachers' competence is specified by standards for educational assessment of students as adopted by UNESCO. This is adevelopmental model about the generic abilities or factors of the educator that aim at identifying the broad competence of the teachers in the art of teaching and learning processes across grade levels. It also include content areas showing the aspects of each ability as it typically develops

from beginning to developing and to advance performance in teaching (UNESCO, 1990).

The standards express specific expectations for assessing knowledge or skills that teachers should possess in order to perform well in their evaluation effort (Ololube, 2008). According to Sanderson and Vogel (1993) the standards call on teachers to demonstrate skill at selecting, developing, applying, using, communicating, and evaluating students' assessment information and students' assessment practices. Okpala (2002) noted that few teachers in Nigeria know that good teaching is characterized by assessments that motivate and engage students in ways that are consistent with their philosophies of teaching and learning and with theories of development, learning and motivation. Furthermore, Schafer (2002) asserted that most teachers want to use constructed-response assessments because they believe this kind of testing is best to ascertain students' understanding. McMillan (2000) has observed that what is most essential about assessment is to understand how general, fundamental assessment principles and ideas can be used to enhance students' learning and teacher effectiveness. Once all the alternatives are understood, priorities need to be made and trade- offs are inevitable. It is by this that teachers and administrators will appreciate that teaching standards will make better informed and better justified assessment decisions.

Ololube (2008) evaluated competencies of professional and non-professional teachers in Nigeria. The researcher reported that professional teachers tend to construct various effective evaluative instruments more than the non-professional teachers. It was also found in Ololube's study that professional teachers have the propensity to employ various evaluation techniques correctly, which is not likely with the non-professional teachers. The author therefore concludes that professional teachers kept assessment records more accurately than non-professional teachers.

In a study carried out by Ololube (2005) on benchmarking the motivational competencies of academically qualified teachers and professionally qualified teachers in Nigerian secondary schools, it was found that academically qualified teachers were less satisfied with the evaluation processes of students than the professionally qualified teachers. By implication, the professional teachers were satisfied because they had competence in knowledge and skills in handling evaluation situations in the classrooms.

Kazuko (2010) assessed Japanese high mathematics teacher competence in real world problem solving with test questions taken from American pre-calculus first year calculus textbooks. The study showed that the teachers, each of whom hold a B.A in Mathematics, physic or engineering possessed solid foundation of mathematical knowledge and skill in their written answers to mathematical modeling problems, concept of which they were not familiar with. Researchers such as Kanu (1996), Chau (1996), Whitty (1996) and Darling-Hammond (2000) referred to teacher competence when they stressed that the quality of test questions depends on the quality of the teacher. Chau (1996) maintains that a teachers' level of competence is one of the factors that directly affect the quality of his/her test questions.

3. Content Validity of Teacher Made Test

The question is always asked whether a test is valid or not. Content validity has to do with the extent to which a test is able to measure what it intends to measure. When a test has content validity, the items on the test should represent all the range of possible items the test should cover. Oescher and Kirby (1990) in determining the content validity of mathematics and science (teacher made test) that were conducted by teachers; collected most recently administered questions constructed by teachers. They reported a relationship between teachers' knowledge of test item construction and content validity. They also noted that teachers who had knowledge of test construction had qualitative items than those who do not have.

Hamman-Tukur and kamis (2000) study of content analysis on implications for testing, teaching and development sampled three categories of students' examinations questions in University of Maiduguri (200, 300, and 400 levels). All students were B. Sc. Biochemistry students of the university. The study revealed that a preponderance of examination questions assessed simple learning outcomes of knowledge and comprehension categories of the cognitive domain at the expense of learning outcomes that call for synthesis and evaluation. As a rider to this finding, the authors recommended that there is need to sensitize teachers on the importance of setting questions that assess these complex learning outcomes.

4. Methodology

Content analysis and correlational design was used to answer the research question and to test the hypothesis raised for this study. The population for the study was 75 teachers of commerce. Of this number, 16 of the teachers were from public schools (schools owned by Government) while 59 of the commerce teachers were from the private schools (schools owned by private individuals). A 42 item questionnaire divided into 8 sections covered all aspects of the standards. The response mode was fashioned after a five scale; 5 for always and 1 for not at all. The Cronbach alpha reliability = 0.818. A profoma for assessing content validity and learning outcome was used. Past teacher-made examination questions were also assessed. Contingency coefficient was used to test the hypothesis raised in the study.

5. Results

Research question 1: what is the area of competence of

Borno state secondary school teachers of commerce in construction of examination questions?

Table 1.1. Percentage distribution of commerce teachers' competence in construction of examination questions

S/No	Items	Always	Almost Always	Sometimes	Frequently	Not at all
B	**Developing Assessment Method Appropriate for Instructional Decisions**					
5.	I understand how valid assessment data supports instructional activities.	47 (62.7%)	16 (21.3%)	9 (12.0%)	2 (2.7%)	1 (1.3%)
6.	I diagnosed group and individual needs of student.	24 (32.0%)	18 (24.0%)	29 (38.7%)	3 (4.0%)	1 (1.3%)
7.	I use test results to motivate students	31 (41.3%)	19 (25.3%)	15 (20%)	10 (13.3%)	0
8.	I do use test results to evaluate instruction.	26 (34.7%)	21 (28%)	16 (21.3%)	9 (12.0%)	3 (4.0%)
9.	I do use evaluation assessment options when I give my test.	27 (36%)	12 (16%)	17 (22.7%)	9 (12%)	10 (13.3%)
10.	Cultural background of students is not important in test construction.	12 (16%)	7 (9.3%)	26 (34.7%)	3 (4.0%)	27 (36%)
11.	Social background of students is not import in test construction.	13 (17.3%)	5 (6.7%)	25 (33.3%)	2 (2.7%)	30 (40%)
12.	Economic background of students is not important in test construction.	17 (22.7%)	9 (12%)	20 (26.7%)	3 (4.0%)	26 (34.7%)
13.	I do use test results to make appropriate decision about my students.	40 (53.3%)	8 (10.7%)	16 (21.3%)	4 (5.3%)	7 (9.3%)
14.	I collect information that facilitates my decision about a test.	27 (36%)	19 (25.3%)	17 (22.7%)	8 (10.7%)	4 (5.3%)
15.	I use students' test data to analyze the quality of my assessment techniques.	27 (36%)	21 (28%)	13 (17.3%)	10 (13.3%)	4 (5.3%)
16.	I use various assessment methods in teaching my subject.	36 (48%)	25 (33.3%)	5 (6.7%)	9 (12%)	0
17.	I avoid common mistakes in student assessment.	37 (49.3%)	21 (28%)	5 (6.7%)	8 (10.7%)	4 (5.3%)
	SUBTOTAL	16 (21.3%)	11 (14.7%)	18 (24%)	17 (22.7%)	13 (17.3%)
C	**Administering, Scoring and Interpreting Results**					
18.	I assess my students' performance in class assignment.	34 (45.3%)	12 (16%)	23 (30.7%)	4 (5.3%)	2 (2.7%)
19.	I assess my students' performance in home work assignment.	17 (22.7%)	14 (18.7%)	31 (41.3%)	6 (8%)	7 (9.3%)
20.	I use guide for scoring essay type questions and projects.	27 (36%)	12 (16%)	22 (29.3%)	8 (10.7%)	6 (8%)
21.	I use stencils for scoring response choice questions.	11 (14.7%)	4 (5.3%)	23 (30.7%)	11 (14.7%)	26 (34.7%)
22.	I use scales for rating performance assessment.	17 (22.7%)	8 (10.7%)	25 (33.3%)	8 (10.7%)	17 (22.7%)
23.	I can interpret report scores in percentile.	25 (33.3%)	19 (25.3%)	17 (22.7%)	4 (5.3%)	10 (13.3%)
24.	I can correct raw scores into standardize.	24 (32%)	17 (22.7%)	15 (20%)	9 (12%)	10 (13.3%)
	SUBTOTAL	13 (17.3%)	13 (17.3%)	21 (28%)	14 (18.7%)	14 (18.7%)

D	Using Assessment Results					
25.	I interpret accumulated assessment information.	23 (30.7%)	20 (26.7%)	13 (17.3%)	11 (14.7%)	8 (10.7%)
26.	I use accumulated assessment information to facilitate students learning.	25 (33.3%)	20 (26.7%)	12 (16%)	12 (16%)	6 (8.0%)
27.	I use assessment results to evaluate my teaching methods.	38 (50.7%)	13 (17.3%)	13 (17.3%)	7 (9.3%)	4 (5.3%)
28.	I interpret test result to students.	25 (33.3%)	18 (24%)	23 (30.7%)	2 (2.7%)	7 (9.3%)
	SUBTOTAL	17 (22.7%)	11 (14.7%)	13 (17.3%)	21 (28%)	13 (17.3%)
E	**Developing Valid Students Grading Procedures**					
29.	I use grades as punishment for erring students.	7 (9.3%)	13 (17.3%)	17 (22.7%)	5 (6.7%)	33 (44%)
30.	I modify my grading procedures at different times.	11 (14.7%)	18 (24%)	23 (30.7%)	9 (12%)	14 (18.7%)
31.	Students understand my grading system.	17 (22.7%)	18 (24%)	22 (29.3%)	4 (5.3%)	14 (18.7%)
32.	Parents are familiar with my grading system.	22 (29.3%)	11 (14.7%)	19 (25.3%)	3 (4.0%)	20 (26.7%
	SUBTOTAL	17 (22.7%)	12 (16%)	16 (21.3%)	12 (16%)	18 (24%)
F	**Communicating Assessment Results**					
33.	I discuss assessment results with other teachers.	20 (26.7%)	16 (21.3%)	25 (33.3%)	5 (6.7%)	9 (12%)
34.	I use appropriate terminology in reporting the meaning of assessment.	40 (53.3%)	18 (24%)	10 (13.3%)	2 (2.7%)	5 (6.7%)
35.	I explain the importance of taking examination to my students.	48 (64%)	16 (21.3%)	6 (8%)	2 (2.7%)	3 (4%)
36.	I recognize measurement errors in my assessment.	19 (25.3%)	25 (33.3%)	18 (24%)	9 (12%)	4 (5.3%)
37.	I understand the limitation of the assessment method.	27 (36%)	24 (32%)	11 (14.7%)	4 (5.3%)	9 (12%)
	SUBTOTAL	16 (21.3%)	10 (13.3%)	14 (18.7%)	19 (25.3%)	16 (21.3%)
G	**Recognizing unethical and illegal assessment methods**					
38.	I am familiar with the laws for prohibiting the exams malpractice.	47 (62.7%)	8 (10.7%)	11 (14.7%)	3 (4%)	6 (8%)
39.	I am familiar with procedures that lead to misuse of assessment results.	36 (48%)	16 (21.3%)	10 (13.3%)	5 (6.7%)	8 (10.7%)
40.	I am familiar with procedures that lead to overuse of assessment results.	31 (41.3%)	17 (22.7%)	17 (22.7%)	5 (6.7%)	5 (6.7%)
41.	Students have no right to confidentiality in assessment.	16 (21.3%)	13 (17.3%)	26 (34.7%)	3 (4%)	17 (22.7%)
42.	Teacher tests are not measures of teaching effectiveness.	15 (20%)	8 (10.7%)	30 (40%)	5 (6.7%)	17 (22.7%)
	SUBTOTAL	14 (18.7%)	15 (20%)	14 (18.7%)	18 (24%)	14 (18.7%)
	Total	986 (34.6%)	579 (20.3%)	675 (23.7%)	226 (7.9%)	384 (13.5%)

Table 1.1 presents the areas of commerce teachers' competence. It showed that teachers of commerce were competent in the areas of administering, scoring and interpreting results. Competence was also shown by the teachers of commerce in the areas of using assessment results to facilitate students learning and to evaluate their teaching methods.

Teachers of commerce in Borno state senior secondary schools did not show competence in the areas of developing valid students grading procedures, communicating results, and recognizing unethical and illegal assessment methods.

Research question 2: what is the content validity of examination questions set by Borno state senior secondary school teachers of commerce?

Table 1.2A. Content validity of teachers of commerce multiple choice examination questions

Level of cognitive domain	Multiple choice questions Teacher	Ideal	Discrepancy (Teacher-Ideal)
Remembering	58%	40%	18%
Understanding	30%	40%	-10%
Applying	6%	5%	1%
Analyzing	4.3%	5%	-0.7%
Evaluating	1%	5%	-4%
Creating	0.7%	5%	-4.3%
Total	100%	100%	

Table 1.2.a presents the percentage of the levels of the cognitive domain assessed by teachers against the ideal as recommended by the curriculum. The teachers assessed 18% more of remembering than the ideal and 1% more of applying than the ideal. On the other hand, they assessed low of understanding, creating, evaluating and analyzing than the ideal. The teachers emphasized remembering more than any of the levels of the cognitive domain.

Table 1.2B. Content validity of teachers of commerce essay examination questions

Level of cognitive domain	Essay questions Teacher	Ideal	Discrepancy (Teacher-Ideal)
Remembering	61%	30%	31%
Understanding	18%	30%	-12%
Applying	8%	10%	-2%
Analyzing	8%	10%	-2%
Evaluating	2%	10%	-8%
Creating	3%	10%	-7%
Total	100%	100%	

Table 1.2 b presents the percentage levels of cognitive domain assessed by teachers against the ideal as recommended by the curriculum. The teachers assessed 31% more of remembering than the ideal. On the other hand, they assessed low of understanding, applying, analyzing, evaluating and creating than ideal. The teachers emphasized remembering more than any other levels of the cognitive

domain.

It was hypothesized that there is no significant relationship between Borno state senior secondary schools teachers of commerce competence and content validity of their examination questions?

The result of the hypothesis tested using contingency coefficient is presented in the table 1.3.

Table 1.3. Contingency coefficient of teachers of commerce competence and content validity for multiple choice and essay examination questions

Variable	χ^2	Df	Contingency coefficient	p-value	Remark
Teacher competence and content validity of multiple choice test	6.056	4	.273	.195	Not significant
Teacher competence and content validity of essay test	3.84	4	.220	.429	Not significant

Table 1.3: presents a contingency coefficient of teacher competence and content validity. The results indicate that the value of contingency coefficient was significant. The null hypothesis is therefore accepted. This means that teachers' of commerce competence was not significantly related to the content validity of their examination questions.

6. Discussion

Commerce is a subject so flexible that exposes prospective students for accounting, business management, commercial law etc to be fully abreast of professionalization. The subject seems to be treated with levity in most Nigerian schools due to the emphasis on science based courses. From the foregoing analysis, it appears that teachers of commerce in Borno state senior secondary schools did not show competence in the areas of developing valid students grading procedures, communicating results, and recognizing unethical and illegal assessment methods. This is consistent with the findings of Okpala (2002) which revealed that few teachers in Nigeria know that good teaching is characterized by assessments that motivate and engage students in ways that are consistent with their philosophies of teaching and learning and with theories of development, learning and motivation.

Apparently, it may be observed that due to insufficient knowledge of what it takes to construct examination questions, the teachers assessed 18% more of remembering than the ideal and 1% more of applying than the ideal. On the other hand, they assessed low understanding, creating, evaluating and analyzing than the ideal. The teachers emphasized remembering more than any of the levels of the cognitive domain. This supports the findings of Hamman-Tukur and kamis (2000) on in which the study

revealed that a preponderance of examination questions assessed simple learning outcomes of knowledge and comprehension categories of the cognitive domain at the expense of learning outcomes that call for synthesis and evaluation.

It was more revealing when the teachers assessed 31% more of remembering than the ideal. The results indicate that the value of contingency coefficient was not significant in which case the null hypothesis was accepted. This means that teachers' of commerce competence was not significantly related to the content validity of their examination questions. This outcome is largely attributed to insufficient knowledge in the construction of examination questions based on the Bloom's taxonomy being applied in teaching. As suggested by D'Agostino, (2007) that learning cannot be meaningful without teachers themselves being competent in the art and science of handling the tools; which are the tests and examinations

7. Conclusions

Based on the findings of this study, it was concluded that the teachers in Borno state senior secondary school were not competent in constructing their examination questions based on the United Nations Educational Scientific and Cultural Organization (UNESC0) standards. The teachers' examination questions had low content validity that emphasized lower levels of cognitive domain remembering, understanding and applying.

8. Recommendations

The following recommendations are made:

The state ministry of education should organize seminars/ workshops and provide in-service training for Borno state senior secondary school teachers to up-grade their knowledge in the art of testing to raise the standard of test construction to cover the different categories of the cognitive domain.

Teachers of commerce in Borno state senior secondary schools should get use to the application of the Bloom's taxonomy when setting their examination questions.

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