Assessment of Primary School Teacher-Made Mathematics Test in Bauchi State, Nigeria

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Abstract
There is need to assess the output process and quality of primary school teacher-made mathematics test. The objectives of the study include determining the quality of primary school teacher –made mathematics test; the extent of disparity of test content among various primary schools within the State. A survey research design was adopted for the study. Bauchi State Basic Education Board (SUBEB) has a population of 913 mathematics teachers at primary school level, out of which 697 are males and 216 are females distributed within the 20 Local Government Areas of the State. A Sample of 269 teachers comprising 204 males and 65 females were selected based on Proportional Stratified random sampling. Teacher–made test questionnaire was developed, validated and used for data collection. The reliability coefficient of 0.84 was established using Cronbach's alpha. The data were analyzed using descriptive statistics, percentages and bar chart. The findings from the study showed that moderation of the teacher –made mathematics test is not done by experts; wide disparity in test content are among the challenges of primary school teacher-made mathematics test in the State. Moderation of test by head teachers at school level, establishment of Assessment Clinic Program me in charge of training and re-training of teachers on assessment practices at State level and attendance of workshops / seminars to update teacher knowledge on good assessment practices   are some of the recommendations made.
Keywords: **Teacher-made Mathematics test, Quality of test &   SUBEB**.

Introduction

Mathematics is one of the compulsory subjects at primary and secondary school level.one of the goals of primary education as contained in the National Policy in Education is "to inculcate permanent literacy and numeracy , and ability to communicate effectively" (FRN,2004 p.14). Contributions and suggestions have been made by researchers (Akpan, 1988; Jamar, 1992; Aliyu, Lakpine and Dauda 2010) on increasing the effectiveness of teaching and learning of Mathyematics at Primary school levels. In addition to the Federal Government of Nigeria's efforts in the distribution of instructional mathematics teaching aids/kits to primary schools. (Solarin, 2012). Despite these efforts, the government at various levels, parents and stakeholders

in education are dissatisfied with the products of pupils from primary schools. Musa and Dakun, (2001 p.3) as cited in Bigwen, 2010 state that:

"Children who completed primary school education in their large number can neither correctly write their names nor are acquainted with depth numeracy that can afford them opportunities to focus the challenges of the environment: (p.81).

Indeed, most of the primary school pupils perform woefully at their first term in Junior Secondary Schools in Mathematics. The assumption is, how qualitative are the Assessment practices in Primary schools mathematics classes?

Primary school mathematics teacher made –test refers to the classroom mathematics test designed, administered and scored by those teachers teaching in primary schools for children aged 6-11 years and above. Creating a valid and reliable test instrument for the classroom is time consuming process. It requires teachers to thoroughly consider the content, goal and outcomes of the assessment results. Ugodulunwa (2014, p.1) defines "assessment as the process of gathering information for the purposes of decision making". The quality of assessment depends on the quality of the teachers. Modibbo (2012,p.25), reports "in the North East and North West of Nigeria that 70% of teachers in the schools are not qualified which means they don't have a minimum teaching qualification of NCE". Minimum teaching qualification should not be a measure of ensuring quality at the primary schools but emphasis should be on methodology-how we teach and how we ascertain that what was taught was inculcated by the pupils should also count. A gap existed between the output and then process;' government emphasis is on the minimum qualification while experts' concerned is on methodology (i.e, how we assess the pupils).

There is need to assess output process. In view of this, the study was designed to Assess:
i. The quality of primary school teacher- made test in content coverage.
ii. The extent of disparity in test content.
iii. Determine the stages considered by teachers when constructing tests.
iv. Determining items writing stages used by the teachers.
v. Determine the most frequent type of teacher –made mathematics test.

The following research questions are used.
i. what is the quality of primary school teacher- made mathematics test?
ii. Is there disparity in test content from various primary schools within state?
iii. Do teachers take into consideration the stages of test consideration?
iv. Do the teachers consider the items writing stage in test construction?
v. What type of teacher –made mathematics is the most frequent?

The significance of the study include exploring the quality of primary school teacher- made mathematics test which could assist education stakeholders, government, teachers and school administrators in improving the assessment practices in schools. It equally hopes to contribute in drawing attention of researchers in assessment practices in carrying out research in the quality of primary school teacher-made test in other subjects.

Methodology

The research design adopted for the study was the survey research design. The populations of the study were 913 mathematics teachers at the primary school level within the 20 local Government Areas of Bauchi State. The population was characterized by both males and females with various years of teaching experience and qualifications ranging from Grade II, N.C.E. BSc/HND, Higher degree and Post Graduate Diploma Education (PGDE). 92 of the 913 teachers did not specify their qualifications teachers.

Table 1 Distribution of the Primary School Mathematics Teachers in the State based on Gender and qualification.

Gender	Grade II	NCE	BSc/HND	High Degree	PGDE	None	Total
Male	161	396	32	10	18	80	697
Female	36	154	6	3	5	12	216
Total	197	550	38	13	23	92	913

Source: Bauchi State Universal Basic Education (SUBEB), 2014.

A proportional Stratified random sampling technique was used. Samples of 269 teachers were selected comprising of 205 males and 64 females' mathematics teachers.

Table 2 Sample of Primary School Mathematics Teachers as used in the study.

Gender	Grade II	NCE	BSc/HND	High/Degree	PGDE	NONE	Total
Male	47	117	9	3	5	23	204
Female	11	45	2	1	2	4	65
Total	58	162	11	4	7	27	269

The Teacher made-mathematics test inventory questionnaire developed by the researcher was used for the study. The instrument was divided into four sections, A, B, C, and D respectively. Section A dealt with personal data, section B contained 15 items on five point likert scale ranging from Strongly Agree- Strongly Disagree. Of the 15 items, only item 2, 5, 11, and 15 were negative responses. The positive response items were scored 5-1(i.e, 5 for Strongly Agree-1, for Strongly Disagree). The scoring was reversed for the negative response items. The maximum score for all the items is 75 marks while the minimum score is 15 marks. Total score for each item is taken as the index of Assessment for the teacher- made mathematics test. The mean score of 3 ($M = 3$) and above for each scored item indicates agreement or acceptance with the statement on the item. While the mean score less than 3 indicates disagreement or rejection of the statement on the item each item. Section C requires the teacher to write briefly on the stages he/she considered when constructing test with section D demanding the teacher attach the most recent End of Session test question paper for his/her class. A sample of 100 were selected at random from primary 6-primary2 (20 from each class) . At initial stage, 20 items were

developed. However, results analyzed from pilot testing using 30 mathematics teachers from Bauchi metropolis shows item 4, 16, 17, 19 and 20 each having correlation score below 3(ie,not measuring the same construct or characteristics with other items). The items (i.e, 4 , 16, 17, 19 and 20) were dropped. A total of 15 items were retained and used for the study. Cronbach's Alpha of 0.84 was established as the coefficient of reliability of the instrument. Long Vocation Students (LVT) in the course Educational Research Methods and Statistics were Research Assistants for data collection. The results obtained were analyzed using descriptive statistics, percentages and bar chart.

Results

Results revealed that the teachers on the average had 11 years of teaching experience. Similarly, primary 6 was the most frequent class taught by the sampled population. Above 70% of the teachers had never attended any workshop/seminar, 20% attended once while the remaining 8% had attended more than once.

Table 3 Results obtained from the administered instrument.

S/N	Item	SA	A	U	D	SD	Mean	Remark
1.	Good test writing skills are important when writing a test.	145 53.9%	102 37.9%	4 1.5%	8 3%	10 3.7%	4.4	Accepted
2.	My test items does not capture all the learning that took place within the term.	38 14.1%	104 38.7%	28 10.4%	69 25.7%	30 11.2%	2.8	Rejected
3.	Each test item (questions) provides some evidence of the learning that takes place in the class.	95 35.3%	145 53.9%	7 2.6%	8 3%	14 5.2%	4.1	Accepted
4.	I write test questions on the board to enhance pupils performance	79 29.4%	132 49.1%	17 6.3%	20 7.4%	21 7.8%	2.2	Rejected
5.	I give test to pupils whenever I wish.	26 9.7%	60 22.3%	32 11.9%	94 34.9%	57 21.2%	3.5	Accepted
6.	I decide on what should be evaluated.	35 17.7%	91 46%	25 12.6%	138 19.2%	9 4.6%	1.8	Rejected
7.	I bear in mind the approaches to be used in selecting the test items.	70 26%	130 48.3%	14 5.2%	26 9.7%	29 10.2%	3.7	Accepted

	Statement	SA	A	U	D	SD	Mean	Decision
8.	I give weekly test to my pupils at the end of each topic.	48 17.8%	116 43.1%	38 14.1%	46 17.1%	21 7.8%	3.5	Accepted
9.	Time given to pupils to complete the test is quite adequate.	62 23.1%	134 49.8%	21 7.8%	25 9.3%	24 10%	3.7	Accepted
10.	I always consider the nature of assessment when writing test for my class	79 29.4%	133 49.4%	15 5.6%	22 8.2%	20 7.4%	3.9	Accepted
11.	My evaluation formats does not compare learners performance with others in the same group.	22 8.2%	55 20.5%	52 19.3%	84 31.2%	40 14.9%	3.1	Accepted
12.	My evaluation items are always self-references; comparing what the learner can do vs. what she/he could do previously.	47 17.5%	149 55.4%	22 8.2%	32 11.9%	19 7.1%	3.6	Accepted
13.	My test questions are always moderated by my colleagues.	55 20.5%	108 40.2%	35 13%	55 20.5%	16 6%	3.5	Accepted
14.	I used table of specification for selecting my test items.	31 11.5%	146 54.3%	40 14.9%	24 8.9%	28 10.4%	2.2	Rejected
15.	I always give each item the same mark	27 10%	61 22.7%	32 11.9%	107 39.8%	42 15.6%	3.3	Accepted

Weighted Mean= 3.00, S.D= 1.0

Result obtained from Section C of the questionnaire indicated 51% of the teachers take into consideration of the stages in test construction with 46% who do not and 3% did not respond on the item.

Results obtained from section D of the questionnaire that required the teacher to attach the most recent end of session test question paper for his/her class was summarized on fig1 .below. The result was obtained from the sample of 100 test question papers.

Teacher –made mathematics type test in primary schools
Table 4. Cognitive domain captured by the sample teacher –made mathematics test in primary schools

Cognitive	Primary 6	Primary 5	Primary 4	Primary 3	Primary2
Knowledge	Nil	Nil	Nil	Nil	20 (100%)
Compre	17(85%)	17(85%)	18(90%)	18(90%)	Nil

Application	3(15%)	2 (10%)	2(10%)	2(10%)	Nil
Skills	Nil	1(5%)	Nil	Nil	Nil
Analysis	Nil	Nil	Nil	Nil	Nil
Synthesis	Nil	Nil	Nil	Nil	Nil

Discussion of Findings

In discussing the results of the study limitation on assessment of gender difference in primary school teacher-made mathematics test and reliability of primary school teacher – mathematics- made test scores must be acknowledged.

From the result an average of 11 years teaching experience was obtained. From the finding of the study primary 6 is most frequent class taught by the sampled population. Also from the finding only 28% of the teachers had attended workshop/seminar.

From the table iii above, item 2, 3, and 14 were used to answer quality of the test on the research question1. Rejection of item2 indicated the test item captured the learning that took place; item 14 signified rejections on the uses of table of specification while acceptance of item 3 indicated the test items reflects the behavioral objectives covered. However, from simple analysis of the result on table iv only low level of cognitive aspect being tested. Of the 6 cognitive categories comprehension has the highest percentages with application having the least. And this has implication especially at the higher primary school level as the nature of the questions do not pupil critical reasoning in solving problems.

Result obtained from Section C of the questionnaire indicated 51% of the teachers take into consideration of the stages in test construction with 46% who do not and 3% did not respond on the item. Acceptance of item 1, 10 and 12 showed the item writing stage in test construction is taken into cognizance by teachers.

Item 13 and item 15 are used to assess the reliability of the test. Acceptance of the item13 revealed that moderation is done not by experts. Item15 testified the uses of marking scheme by the teachers..

Items 6, 7, 8 and 9 are used to answer the research question 2 on test disparity in test content coverage. Item 6 showed rejection while item7, 8, and 9 showed acceptance but analysis from table iv revealed wider disparity in test content coverage. This finding is in agreement with of Mertler (1999), on the understanding of concept of reliability by teachers than validity. The result on figure1 was also used to answer research question 4.from the figure 1, the most frequent test type is Essay type of the test with 96% while only 4% combined Essay and Objectives items. This would have implication as primary 6 pupils are not exposed to the standardized type of test items.

Conclusion and Recommendations

The study focuses on the need to assess the output process and the quality of the teacher – made mathematics test in primary schools in Bauchi State. Data was obtained and analyzed.

The teacher –made mathematics test in the State is not without challenges. These challenges are highlighted and recommendations were made.

To improve the quality of the primary school teacher - made mathematics test in the State, the following recommendations were made.

- Community leaders at the state and local government levels should come up with an Annual programme known as Assessment Clinic Programme which is non-governmental and non-profit programme with responsibility of training and re-training of primary school teachers on Assessment practice.
- Community leaders and Officials of Parent Teachers Association to liase with State Basic Education Board (SUBBEB) in setting up Committees in charge for monitoring of Assessment in Primary Schools.
- Workshops/Seminars should be communicated through community leaders and Parent Teachers Association (PTA) officials to ensure qualified teachers are in attendance.
- Headmasters/ Heads of department should introduce a Vetting committee responsible for vetting the set questions in line with table of specification.
- Teachers should be encouraged to combine Essay and Objectives items at the senior classes.
- Some test items should reflect questions from the mathematics text books as this would encourage teachers and students to make use of the text books.

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