

Test-Item Construction Competencies among Academic Staff of Public Universities in Edo State, Nigeria

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Abstract—This study assessed test -item construction competencies among academic staff of public universities in Edo State, Nigeria. One research question was raised and one hypothesis was formulated and tested. This descriptive survey design was adopted for the study. The population covered all the 2,388 academic staff in Ambrose Alli University, Ekpoma and University of Benin, Benin City as at 2022. The simple random sampling technique was used to select 10% of the total number of staff. Hence, 239 academic staff were drawn by simple random sampling technique. The instrument used for data collection was 25-item questionnaire adopted from an existing test-item construction scale. Research question 1 was analysed using mean (\bar{X}) while the independent t-test for two sample means was used to test the hypothesis at 0.05 level of significance. Findings revealed that the academic staff had low competency in test-item construction and their year of experience was positively correlated with their level of competency on test-item construction. Based on results, it was recommended that a learning management system should be implemented by the government to help the government and the university management monitor lectures, students' assessment, grading and feedback by every academic staff from a central control system. This will help to stop the act of repeatedly setting past questions for students irrespective of whether they are taught or not.

Keywords—Test Construction, Teachers' Experience, Teachers' Educational Quality, Assessment

I. INTRODUCTION

Universities are organizations created to have a constructive influence on society, the people that make up that society, and other areas. As a place of learning, it aids society in resolving issues and helps communities by providing necessary services that may raise those communities' developmental standards (Osumah, Omi-Ujuanbi, & Akpede, 2022). A fundamental force behind every nation's economic,

sociopolitical, and overall growth is higher education (Federal Republic of Nigeria, 2013). It focuses on developing or teaching knowledge-based motivational skills and abilities that are supported by creativity for problem-solving orientation in order to access and transform possibilities.

The Federal Republic of Nigeria specifically stated in Section 8 Number 59 of the 2016 version of the National Policy on Education that the following objectives are among those that universities as higher institutions in Nigeria are intended to achieve:

- a. promote national development by providing highly qualified, relevant workforce training;
- b. growth includes appropriate values for the individual society's existence;
- c. enhance people's intellectual ability to comprehend and value their immediate and wider settings;
- d. develop physical and mental abilities that will allow one to be independent and valuable members of society;
- e. fosters and promotes community service and scholarship;
- f. establish and strengthen national unity; and
- g. encourage dialogue and understanding between nations (Federal Republic of Nigeria, 2013, p. 6).

Since universities are supposed to generate graduates who are capable of contributing to national progress, one significant method of assessing behavioural or academic results and demonstrating growth in intellectual capacity and character has been the use of tests (Bichi, Hafiz, & Bello, 2016). A test is a group of questions (items) that have correct answers and serve as the main pillars of teaching and learning objectives. Test is regarded as a common method for estimating a sample of behavior from a certain area (Amusan, 2020). A test is a controlled environment with a series of tasks or inquiries to which a person must reply. Good test items have the capacity and propensity to evaluate students' cognitive, psychomotor, and practical skills (Osiesi, 2019).

One of the duties of instructors is to create effective exam items. This implies that every instructor must possess the information and abilities necessary for the efficient creation of quality test materials. Sadly, academics have consistently reported that instructors' abilities to develop tests are subpar (Opateye, 2016). Poor test construction abilities were shown to be a more widespread problem among non-professional instructors (Amusan, 2020). Sound subject understanding and fundamental skills are necessary for the creation of an effective exam. This is why it was highlighted that subject-matter expertise has a favorable impact on a teacher's fundamental subject-matter competence. It makes logical to claim that the quality of the test items is determined by the teacher's skill in test creation.

Due to their attitude or belief that testing at the higher education level is excessively time-consuming and superfluous, the majority of academic staff develops substandard test items (Opie, Oko-Ngaji, Eduwem, & Nsor, 2021). As a result, the majority of academic staff sometimes uses old or preexisting questions to evaluate learners. Due to the incessant strike actions by the academic staff union at universities and the disruption of the academic calendar caused by trade union disputes over unpaid wages, arrears, the choice of payment methods, and other related issues, the majority of universities and lecturers use old or pre-existing exam questions that may contain information that students weren't taught. Teachers must develop their competences by learning the specifics of test-item development in order to enhance assessment and evaluation of learners in order to overcome this problem.

Some of these talents include, but are not limited to, objectivity, communication ability, item validation expertise, and capability of using suitable techniques for determining the reliability and validity of test instruments (Osadebe, 2015). These skills provide a teacher the ability to design exams with accuracy, acceptable language usage, impartiality, and suitable grading systems. Therefore, test constructs are crucial to instructors because they enable them to, among other things, build items that are appropriate for students with various personal characteristics and write questions to elicit clear and succinct replies from students. The evaluation of students' accomplishments may be erroneous as a consequence of teachers' inability to provide relevant and reliable test items. It is a serious issue in Nigerian schools that needs immediate action (Eleje, & Esomonu, 2018).

Research has been done to evaluate building skill and competences (Quansah, Amoako and Ankomah, 2019; Amusan, 2020; Akpan, 2021). According to Amusan (2020), 50% of examination moderators remarked that they are not always happy with the format of their marking guides, and 48% of lecturers acknowledged that they required help creating structured assessments, particularly for essay questions rather than multiple-choice questions

(MCQs). The ability of Senior High Schools (SHS) teachers in Cape Coast Metropolis, Ghana, to design examinations was studied by Quansah, Amoako, and Ankomah in 2019. The results demonstrated that the teachers' capacity to create term-ending tests was constrained. When issues with the test's content relevancy and representativeness, as well as the accuracy and fairness of the assessment tasks that were evaluated, were found, this became abundantly evident.

Akpan (2021) carried out a research to find out how much basic education teachers were involved in the creation of examinations for continuous assessment in basic education and how this affected Nigeria's sustainability. The findings of this study showed that basic education teachers do not adhere to the standards and procedures for conducting assessments at that level, even if they are assessing their pupils. Awoniyi (2016) also examined strategies to improve assessment processes and how to conduct assessments for senior high school math teachers more successfully. The study had 110 educators in all, including 100 male and 10 female math professors. The findings indicated that senior high math teachers in the Cape Coast Metropolis continue to use the archaic "continuous assessment" method that seems to be in charge of classroom operations because they are unable to comprehend and apply SBA guidelines.

Salihu (2019) assessed the construct validity of the teacher's knowledge and the validity of the economics curriculum in senior secondary schools in Nasarawa State, Nigeria. From the senior secondary public and private schools in Nasarawa North, 95 Economics teachers were randomly selected. The study's findings revealed, among other things, that there was a significant mean difference in competence for test development between professional instructors and non-professional teachers of economics, as well as for subject validity between teachers in public and private schools.

Ibrahim, Ibrahim, and Amina (2022) assessed the teachers' knowledge of test construction in the Ungogo Local Government Area (LGA) in Kano state, Nigeria. 260 senior secondary school teachers from the local government were the sample for the study. The findings demonstrated that there was no significant difference between male and female instructors' levels of knowledge or comprehension of test design. It was found that neither gender nor level of expertise had an impact on an instructor's comprehension of test creation in Ungogo. The research conducted by Alufohai and Akinlosotu (2016), which looked at the teachers' proficiency with continuous assessment in the Nigerian district of Edo Central Senatorial, also adds to our understanding of test creation for instructors. This is in addition to other research on teacher exam design that has been carried out in different states in Nigeria and internationally has given secondary school teachers greater attention. The degree of test-item production proficiency among the academic staff of public

institutions in Edo State is still unknown in the literature when it comes to the setting of public universities. This work aims to bridge this knowledge gap.

II. RESEARCH QUESTION

The research questions raised to guide this study is given as follows

1) What is the level of competency on test-item construction among academic staff of public universities in Edo State?

III. HYPOTHESIS

The hypothesis formulated and tested in this study is given below

1) There are no significant relationship between competency on test-item construction and years of service among academic staff of public universities in Edo State

IV. METHODS

For this examination, the descriptive research design was used. As of 2022, the population included all 2,388 members of the academic faculty of Ambrose Alli University in Ekpoma and University of Benin in Benin City. 10% of the employees as a whole were chosen using a simple random sample procedure. So, using a simple random sample procedure, 239 academic staff members were chosen. The work of Agu, Onyekuba, and Anyichie

was used to create a questionnaire (2013). Language use, content coverage, item organization, and test guidance were all scored on a four-point Likert type scale with the following values: strongly agree (SA) -4, agree (A) -3, disagree (D) -2, and strongly disagree (SD) -1. The original instrument was a 25-item scale with a reliability coefficient of 0.73 on four factors. The instrument's face and content validity were assessed by two specialists from the Department of Guidance and Counseling at Ambrose Alli University in Ekpoma. The mean (\bar{X}) and standard deviation (SD) was utilized to examine research question 1. (S.D). Using a criterion mean of 2.50, the proficiency of academics in test-item creation was evaluated. The four (4) likert scales (SA 4, A 3, D 2, and SD 1) were added together to arrive at this conclusion. The total (10), which equals 2.50, was then divided by the total scales (4). As a result, good competence is indicated by a score of 2.50 or above, whereas poor competence is indicated by a score of 2.40 to 2.49. The 0.05 level of significance was used to test the hypothesis using the independent t-test for two sample means. The Statistical Package for Social Science (SPSS, IBM Version 20) was used to assess and test the research topic and hypothesis.

V. RESULTS

The result of the analysis are presented as follows

Research Question 1: What is the level of competency on test-item construction among academic staff of public universities in Edo State?

Table 1: Analysis on level of Competency on Test-Item Construction among Academic Staff of Public Universities in Edo State

Item statements	N = 239		
	\bar{X}	S.D	Remark
1. Outline the content covered for the term before setting test from them.	3.24*	.817	High competence
2. Prepare a test blueprint as a guide in the test construction.	3.04*	.918	High competence
3. Consult standard text books in the subject for guide.	2.23	.892	Low competence
4. Organize test items in a logical manner.	2.28	1.087	Low competence
5. Give clear instructions to guide the test takers.	2.24	1.140	Low competence
6. Write test so that both high and low achievers can understand.	2.19	1.211	Low competence
7. Subject test items to item analysis.	2.20	.928	Low competence
8. Keep a resource bank of questions that can be referred to when setting tests.	1.94	.894	Low competence
9. Set tests with due regard to the time available for testing.	2.03	.902	Low competence
10. Add enough test items to cover all the requisite levels of cognitive domain.	1.80	1.004	Low competence
11. Ascribe scores for each test item.	3.22*	.869	High competence
12. Ensure that the items are measuring the determined objectives.	2.56*	1.019	High competence
13. Set essay items that elicits creative and imaginative answers from the students.	2.44	.923	Low competence
14. Prepare a marking guide while constructing the test.	1.90	.947	Low competence
15. Consider the age of learners during item writing.	2.45	.852	Low competence
16. Avoid gender stereotypes in the test items.	2.83*	.683	High competence
17. Add sufficient items to cover the appropriate instructional units.	1.81	.740	Low competence
18. Submit items for vetting to the Head of Department	2.08	.765	Low competence
19. Submit tests meant for semester examinations for expert editing on time.	2.37	.837	Low competence
20. Number diagrams in tests clearly.	2.59*	.815	High competence
21. Avoid the use of interlocking items.	3.19*	.838	High competence
22. Avoid items that measure opinion.	2.00	.883	Low competence

23. Limit essay tests to high level objectives.	2.27	.877	Low competence
24. Avoid overlapping alternatives in writing objective tests.	2.16	.999	Low competence
25. Avoid too long questions or phrases in item writing.	2.11	1.01	Low competence
Overall mean = 2.14			

* \bar{X} is significant with mean score greater than 2.50

The result in Table 1 shows that respondents had a low response score mean on all the items except items 1, 2, 11, 12, 16, 20 and 21 at a mean range between 2.56 to 3.24. The overall mean score of 2.14 is less than the criterion mean of 2.50 (i.e. $\bar{X} = 2.14 < 2.50$). Hence, this implies that the level of competency on test-item construction among academic staff of public universities in Edo State is low.

Hypothesis 1: There are no significant relationship between years of service and competency on test-item construction among academic staff of public universities in Edo State

Table 2: Relationship between Years of Service and Competency on Test-item Construction among Academic Staff of Public Universities in Edo State

Variables	N	\bar{X}	S.D	Pearson r-coefficient	p-value	Remarks
Competency on Test-item Construction	239	2.14	0.914	.442**	0.000	Null hypothesis rejected ($p < 0.05$)
Years of service of academic Staff		2.38	0.558			

****.** *Correlation is significant at the 0.05 level (2-tailed).* Data in Table 2 showed that the Pearson correlation coefficient of 0.442 was statistically significant ($p < 0.05$). Therefore, the null hypothesis was rejected while the alternate hypothesis was accepted. This indicated that there are a significant relationship between years of service and competency on test-item construction among academic staff of public universities in Edo State. The positive sign of the coefficient shows that years of service and competency on test-item construction among academic staff of public universities in Edo State are correlated and move in tandem.

VI. DISCUSSION

The results shows that academic staff at public institutions in Edo State lacks a high degree of proficiency in test-item creation. The findings are in line with those of Quansah, Amoako, and Ankomah (2019), who found that teachers lacked sufficient knowledge in designing end-of-term tests. This became evident when issues were found with the validity and fairness of the assessment tasks, as well as the representativeness and application of the test's structure, after it had been tried among school teachers in the Cape Coast Metropolis. The results disagree with those of Quansah, Amoako, and Ankomah (2019), who found that the teachers' capacity to create end-of-term tests was constrained. This became evident when issues were found in Cape Coast Metropolis, Ghana, with the test's content representativeness and relevance, as well as the validity and fairness of the assessment tasks that were examined.

The findings concur with those of Akpan (2021), who discovered that the majority of basic education teachers do not adhere to the norms and criteria for test creation during assessment. The outcome is consistent with that of Awoniyi (2016), who discovered that senior high school math teachers in the Cape Coast Metropolis do not understand the rules of School Based Assessment and do not put them into practice, so they continue to use the archaic "continuous assessment" approach that appears to be

in charge of classroom operations. Given that the majority of teachers still use antiquated continuous assessment techniques, it was also clear that they are out of touch with contemporary trends and advancements in assessment practices.

The findings indicated that among academic staff members of public institutions in Edo State, there is a substantial correlation between years of service and skill in test-item creation. Therefore, among senior academics in the state, teaching experience is a major predictor of test-item construction. This is consistent with the findings of Salihu (2019), who found that in senior secondary schools in Nasarawa State, Nigeria, there was a significant mean difference in skill between professional instructors and non-professional teachers of economics for test creation and between public school teachers and private school teachers for subject validity. The results, on the other hand, are inconsistent with those of Ibrahim, Ibrahim, and Amina (2022), who found no appreciable variation in the levels of skill or comprehension of test construction among instructors in the Ungogo Local Government Area (LGA) in Kano state, Nigeria. In conclusion, academic personnel at public institutions in Edo State exhibit poor levels of proficiency in test-item creation.

VII. RECOMMENDATIONS

The following recommendations are made for this study:

1). The quality assurance division as part of their duties should endeavour to check mate the excesses of some academics by making them submit their continuous assessment text and examination questions for perusal prior to the assessment week.

2) A learning management system should be implemented by the government to help the government and the university management monitor lectures, students' assessment, grading and feedback by every academic staff from a central control system. This will help to stop the act of repeatedly setting past questions for students irrespective of whether they are taught or not.

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