

Assessment of Testing Competency and Associated Training Needs of In-Service Secondary School Teachers in Kwara State

Shogbesan Yusuf Olayinka¹

Yusuf Florence Adeoti²

Abstract

The study assessed the test construction skills, testing competency level and the training needs of in-service secondary school teachers in Kwara state. Using the survey research design, the population comprised all in-service secondary schools teachers in Kwara state with a sample size of one hundred and eighteen (118) teachers in Ilorin west area selected using stratified random sampling techniques with gender as strata. The study answered three research questions and tested two research hypothesis. An instrument titled: Test construction competency scale was used to obtain information as well as open ended item on the training needs of the teachers. The study found out that the most frequently possessed test construction skills is that they have the ability to "Consult standard textbook in the subject for guide" and can "Give clear instruction to guide the test items" as well. However, the least possessed skills are that they mostly lack the ability to "Avoid gender stereotypes in the test items" during test development stage, "Limit essay tests to high level objectives" and are "not comfortable giving students test items for marking" among others. The result further shows that there is a high level of testing competency among the in-service secondary school teachers in the state. Also, there is no difference in the testing competency level of in-service secondary school teachers in Kwara state base on gender and their year of teaching experience. The study therefore recommended that there should be regular in-service training for teachers to update their assessment skills.

Keywords: Test Construction Skills, Testing Competency, School-Based Assessment, Teacher's training needs

1. Introduction

Educational decisions rely on valid and reliable metrics to inform decision-makers by presenting various alternatives. The primary objective of classroom testing is to acquire valid, reliable, and pertinent information regarding test-takers' achievements. Therefore, a well-designed classroom assessment must yield insights into the latent abilities of examinees. Likewise, effective classroom-based assessment entails compliance with established protocols for test development. Consequently, every classroom educator is anticipated to possess and utilize essential skills in the formulation of effective assessment items. Well-constructed teacher-made assessments enable students to evaluate their knowledge and receive immediate, constructive feedback, thereby enhancing their performance (Sax, 2007). Additionally, these assessments allow teachers to accurately and consistently measure students' mastery of specific content taught in class (Agu, Onyekuba, & Anyichie, 2013). This test construction skill encompasses the competencies necessary for the precise creation of tests, including appropriate language use, objectivity, and effective grading scales (Silker, 2003). Educators must acquire fundamental test construction skills to create assessment items that elicit clear and concise responses from students; design tests suitable for learners of varying ages, abilities, and genders; and administer tests in a manner that enables students to complete them

¹ Ph. D (Tests and Measurement), Lecturer, ORCID number: 0000-0002-1741-1370, Department of Arts and Social Sciences Education, College of Education, Osun State University, Osogbo, Nigeria, email: yusuf.shogbesan@uniosun.edu.ng

² Ph. D (Guidance and Counselling), Professor, ORCID number: 0000-0003-0232-583X, Department of Guidance and Counselling, College of Education, Osun State University, Osogbo, Nigeria. Email: florence.yusuf@uniosun.edu.ng

within the allotted time without inducing anxiety (Ali, as cited in Agu et al., 2013). Competency in testing denotes a teacher's capacity to demonstrate the skills and knowledge acquired through training in a professional setting. The area of teacher competencies has received insufficient attention, as educators may lack an understanding of fundamental principles and skills essential for developing classroom achievement tests. Competence and quality in test construction are essential for any classroom teacher to achieve pedagogical objectives. The significance of assessments in an educational system cannot be overstated, as they are essential for achieving academic objectives. The significance of learning objectives embedded in a school curriculum is the foremost indicator of educational advancement, instructional quality, and personal ambition. Educators must demonstrate proficiency in accurately assessing learning objectives. Similarly, every classroom teacher is required to possess and utilize essential skills in the creation of effective assessment items for classroom testing.

2. Literature review

Yusof et al. (2019) assert that teachers' teaching competency is influenced by three constructs: teaching and learning strategy, teacher-student communication, and teachers' professionalism value. Given that both teaching and learning rely on educators, it is unsurprising that an effective teacher is defined as one who achieves the desired outcomes in their instructional role. It is important to recognize that testing competency is encompassed within teaching and learning strategies, as an effective teacher must possess the ability to both instruct and assess proficiently to enhance or facilitate learning. Competence and skills in test construction for achievement testing are essential tools for any teacher to attain teaching and learning objectives. The importance of assessments in an educational system is substantial, as they are the means through which significant academic objectives are achieved. Educators, as custodians of knowledge, must demonstrate competence in precisely and accurately assessing learning objectives. Likewise, the instruments employed to assess these learning objectives must be precise and accurate to effectively evaluate the teacher's intended outcomes. The capacity to instruct and evaluate effectively is regarded as a fundamental criterion for assessing a competent educator. Student assessment is a fundamental component of teaching, and effective teaching is contingent upon robust student assessment (Eckhout et al., cited in Tagele and Bedilu, 2015). Such outcomes are unattainable without educators possessing proficiency in the art and science of creating valid, reliable, and practical classroom assessment instruments. An effectively constructed assessment enables educators to accurately and consistently evaluate students' proficiency in the specific material covered in class. The results of these tests will enable teachers to assess the efficacy of their classroom instruction. Numerous researchers have examined the test construction abilities of educators. Bedilu (2023) conducted a study evaluating the proficiency of secondary school teachers in student assessment within Bahir Dar town. The findings revealed that the participating teachers exhibited knowledge levels rated below average in educational assessment, with teachers from nongovernmental schools displaying a significantly higher competence than their counterparts in governmental schools. Moreover, a teacher's proficiency in formulating high-quality, unambiguous test items will facilitate the accurate assessment of the intended content and construct. Conversely, when teachers lack the aforementioned attributes, it may adversely affect the quality of constructed test items and the decisions derived from such tests. This may lead to a test exhibiting consequential validity issues. Teachers significantly influence students' academic achievement and play a vital role in educational attainment.

Evaluating the competency of teachers is particularly crucial given the contemporary emphasis on student assessment, which incorporates continuous assessment strategies necessitating enhanced knowledge and skills in evaluation. Therefore, without the implementation of training or other remedial measures to enhance teachers' testing proficiency, the existing substandard quality of education will deteriorate further, potentially leading to a complete breakdown of the educational system. Bedilu, 2023. Given the urgent need to investigate the testing competence of teachers in Kwara State secondary school; hence, this study mainly assessed the test construction skills, testing competency level and the training needs of in-service secondary school teachers in kwara state. The

specifics objectives of this study are to: assess the test construction skills of in-service secondary school teachers in Kwara State; examine the testing competency level of in-service secondary school teachers in the state, and identify the training needs of in-service secondary school teachers in Kwara state.

2.1 Research Questions

The following research questions were raised from the above-stated objectives

- a) What are the test construction skills of in-service secondary school teachers in Kwara State?
- b) What is the testing competency level of in-service secondary school teachers in the state?
- c) What are the training needs of in-service secondary school teachers in Kwara state?

2.2 Research Hypotheses

The study was guided by the following null hypothesis that was tested at the 0.05 level of significance.

- a) There is no significance difference in the testing competency level of in-service secondary school teachers base on gender.
- b) There is no significant difference in the testing competency level of in-service secondary school teachers base on their year of teaching experience.

3. Methodology

3.1. Methods

The survey research design was adopted for the study. Using this approach, the study answered three research questions and tested two research hypotheses without any manipulation.

3.2. Participants

The population of this study comprised all In-service secondary schools teachers in Kwara state. The sample size consisted of a total of one hundred and eighteen (118) teachers from both public and private secondary schools in Ilorin west area of the state who were selected using stratified random sampling techniques with gender as strata.

3.3. Procedure

An instrument titled: The test construction competency scale which contained 40 items some of which are adopted from the Test Construction Skill Inventory (TCSI) for assessing the secondary school teachers' competencies in constructing classroom-based tests developed by Agu et. al. (2013) was used to obtain information on the test construction skills of secondary school teachers and their competency level as well as open-ended item on the training needs required by the teachers to improve their assessment practices. Validity and reliability of the instruments were ascertained as the content validity of the instrument was carried out and finally given to an expert to also ratify with the Cronbach alpha coefficient of 0.81 obtained from an internal consistency exploration in a pilot study of the instrument. The instrument was thereafter administered to the respondents by the researcher with the help of a research assistant. . The quantitative data collected were analyzed using appropriate statistics with the open-ended responses analyzed using content analysis.

3.4. Results and analysis

RQ1: What are the test construction skills of in-service secondary school teachers in Kwara State?

To answer this research question, the responses of the in-service secondary school teachers in Kwara State to test construction skills was subjected to descriptive statistics and the Relative Significant Index (RSI) presented in Table 1.

Table 1: Test construction skills of in-service secondary school teachers in Kwara State

S/N	STATEMENT	Strongly Disagree		Disagree		Agree		Strongly Agree		RSI	Rank
		F	%	F	%	F	%	F	%		
1	Outline the content covered for the term before setting test for students	2	1.7	18	15.3	50	42.4	48	40.7	0.805	22
2	I consult previous test question before setting questions	3	2.5	10	8.5	53	44.9	52	44.1	0.826	11
3	Prepare a test blue print or table of specification as a guide in test construction	3	2.5	13	11	74	62.7	28	23.7	0.769	32
4	Consult standard textbook in the subject for guide	1	0.8	9	7.6	25	21.2	83	70.3	0.903	1
5	Organize test items in a logical manner	3	2.5	7	5.9	86	72.9	22	18.6	0.769	33
6	Give clear instruction to guide the test items	0	0.0	4	3.4	44	37.3	70	59.3	0.89	2
7	Write test so that both high and low achievers can understand	2	1.7	10	8.6	43	36.4	63	53.4	0.854	4
8	Subject test items to item analysis	2	1.7	21	17.8	59	50	36	30.5	0.773	30
9	Keep a resource bank of questions that can be referred to when setting tests	1	0.8	13	11	57	48.3	47	39.8	0.818	17
10	Set tests with due regards to the time available for testing	3	2.5	15	12.7	51	43.2	49	41.5	0.809	20
11	Add enough test items to cover all the requisite levels of cognitive domain	0	0.0	7	5.9	72	61	39	33.1	0.818	18
12	Ascribe scores for each test item	2	1.7	9	7.6	49	41.5	58	49.2	0.845	6

13	Ensure that the items are measuring the determined objectives for teaching the topic	2	1.7	8	6.8	63	53.4	45	38.1	0.82	15
14	Design essay prompts that provoke creative and imaginative responses from students.	1	0.8	13	11	49	41.5	55	46.6	0.835	8
15	Develop a marking rubric concurrently with the test construction.	3	2.5	9	7.6	43	36.4	63	53.4	0.852	5
16	Take into account the age of learners during the composition of items.	2	1.7	17	14.4	36	30.5	63	53.4	0.839	7
17	Eliminate gender stereotypes in the assessment items.	5	4.2	29	24.6	55	46.6	29	24.6	0.729	40
18	Incorporate adequate materials to encompass the relevant instructional unit.	5	4.2	9	7.6	69	58.5	35	29.7	0.784	28
19	Submit items for evaluation to the department head or principal for assessment.	1	0.8	2	1.7	60	50.8	55	46.6	0.858	3
20	Submit items intended for promotional examination for expert review.	3	2.5	13	11	45	38.1	57	48.3	0.831	10
21	Refrain from utilizing hints in multiple-choice inquiries.	5	4.2	15	12.7	62	52.5	36	30.5	0.773	31
22	The numerical diagram in the test is explicit.	5	4.2	16	13.6	50	42.4	47	39.8	0.794	25
23	Refrain from utilizing interlocking components.	3	2.5	18	15.3	73	61.9	24	20.3	0.75	36
24	Refrain from utilizing items that gauge opinion.	5	4.2	17	14.4	60	50.8	36	30.5	0.769	34
25	Examine the test draft a minimum of twice over two days prior to the examination.	5	4.2	24	20.3	57	48.3	32	27.1	0.746	37
26	Restrict essay assessments to elevated objectives.	4	3.4	19	16.1	73	61.9	22	18.6	0.739	39
27	Avoid redundant options when formulating objective assessments.	5	4.2	9	7.6	72	61	32	27.1	0.778	29
28	Employ suitable formats in test composition.	1	0.8	15	12.7	51	43.2	51	43.2	0.822	14
29	Avoid excessively lengthy questions in item writing.	4	3.4	15	12.7	59	50	40	33.9	0.786	27
30	Establish test items that extract information on a singular topic at a time.	3	2.5	13	11	63	53.4	39	33.1	0.792	26
31	Identifying instances of academic dishonesty during examinations	3	2.5	14	11.9	56	47.5	45	38.1	0.803	23
32	Oversight of peer instruction	2	1.7	7	5.9	70	59.3	39	33.1	0.809	21

33	Documenting aspects of the affective domain in student behavior	3	2.5	15	12.7	76	64.4	24	20.3	0.756	35
34	Assessing the reliability of a measuring instrument	2	1.7	6	5.1	70	59.3	40	33.9	0.814	19
35	Documenting students' academic performance	1	0.8	12	10.2	49	41.5	46	47.5	0.824	13
36	Ensuring tests possess content validity	2	1.7	8	6.8	60	50.8	48	40.7	0.826	12
37	Capability to analyze test results to identify areas of difficulty.	2	1.7	16	13.6	55	46.6	45	38.1	0.803	24
38	I am uncomfortable providing students with test items for grading.	11	9.3	23	19.5	42	35.6	42	35.6	0.744	38
39	I consistently provide instructions prior to the initiation of a test or examination.	2	1.7	8	6.8	57	48.3	51	43.2	0.833	9
40	Participating in workshops and seminars focused on test planning, development, and administration.	6	5.1	13	11	41	34.7	58	49.2	0.82	16

The result as presented in the table above shows the test construction skills of in-service secondary school teachers in Kwara State. From the result, the most frequently possessed test construction skills among the in-service secondary school teachers is that they can "Consult standard textbook in the subject for guidance" and can "Give clear instruction to guide the test items" given the relative significant index of 0.903 (1st) and 0.89(2nd) respectively. These skills are closely followed by the fact that most of them usually "Submit items for vetting to the head of the department or principal for vetting" and can "Write tests so that both high and low achievers can understand" given the relatively significant index of 0.858 (3rd) and 0.854(4th) respectively among other prominently possessed test construction skills.

However, the least possessed skills are that they cannot mostly "Avoid gender stereotypes in the test items" during test development stage with the relative significant index (0.754, 40th), "Limit essay tests to high-level objectives" with the relative significant index (0.739, 39th) and they are "not comfortable giving students test items for marking" given the relative significant index, (0.744, 38th). Also, they do not usually "Review draft of the test at least two times in two days before examination" and cannot "Avoid the use of interlocking items" among others given the relative significant index of 0.746 (37th) and 0.75(36th) respectively.

RQ2: What is the testing competency level of in-service secondary school teachers in the state?

To answer this research question, the computed scores of the testing competency level was subjected to descriptive statistics with a minimum and maximum values of 67 and 160 and a mean and standard deviation values of 128.89 and 14.18 respectively. The computed scores were further categorized as 40 through 79 for low, 80 through 119 as moderate and 120 through 160 as high. This was subjected to descriptive statistics and the result are presented in Table 2.

Table 2: Testing competency level of in-service secondary school teachers in the state

Level of Testing Competence	Frequency	%
Low	1	0.8
Moderately	23	19.5
Highly	94	79.7

Total

118

100

The result above shows that the majority of the teachers are highly competent (79.7%) with 19.5% (23) of the teachers possessing a moderate level of testing competence while only 0.8% (1) have a low level of testing competence. Hence, it can be concluded that there is a high level of testing competency among the in-service secondary school teachers in the state.

RQ3: What are the training needs of in-service secondary school teachers in Kwara state?

To answer this research question, the responses provided to the open-ended question asking of the areas they require trainings on test construction which was further interrogated during a focus group interaction conducted during data collection for teachers who made themselves available was subjected to thematic analysis to present the communality associated with the training needs they identified. The themes arising from the thematic analysis done manually by the researchers were presented in Table 3 below;

Table 3: Thematic results of the testing needs of in-service secondary school teachers in Kwara state

S/N	Training Needs	Related Comments
1	Conduct Item Analysis	<i>"I welcome the opportunity to learn or participate in trainings that can enhance my knowledge and ability to conduct item analysis for my test items"</i> <i>"... I will be open to participating in training on item analysis to enhance my understanding and ability to effectively use this too in by classroom assessment practices"</i> <i>"I need trainings on the up-to-date methods and techniques for conducting item analysis especially on how to use it to improve my test validity"</i>
2	Write Flawless test Items	<i>"While I have experience in writing items, I recognize that there is always a room for improvement"</i> <i>"Since writing flawless items are essential for constructing valid tests, I will need to hone my skills in that area as well as gain a deeper understanding of best assessment practices"</i>
5	Develop good scoring rubric/marketing guide	<i>"I will appreciate training on marking guide development to help me create a better way to assess students performance"</i> <i>"Although I can develop marking guide but will need trainings that provide best practices for creating effective and fair scoring guide"</i>
6	Construction of Test Blueprint	<i>"I need training on how to effectively align my tests with curricular objectives and determine the appropriate content representativeness of my tests questions"</i> <i>"I essentially need to be trained on how to identify the cognitive level of each items and ensure my items are content valid"</i> <i>"Well, I cannot really develop good items to measure the various level of cognitive domain of learning"</i>

Summarily, the areas associated with the training needs of the teachers from some of their highlighted responses are areas associated with the ability to; Conduct Item Analysis, Write Flawless test Items, Develop good scoring rubric/marketing guide Construction of Test Blueprint among related others.

Research Hypothesis One: There is no significant difference in the testing competency level of in-service secondary school teachers base on gender.

To test this research hypothesis, the data were subjected to independent sample t-test using gender as a grouping variable. The result of the independent sample t-test are presented in Table 4 below.

Table 4: independent sample t-test exploring differences in the testing competency level of in-service secondary school teachers base on gender

	GENDER	N	Mean	Std. Deviation	Std. Error Mean	df	t	p-value
Testing Competence	MALE	59	128.7627	13.15863	1.71311	116	-0.097	0.923
	FEMALE	59	129.0169	15.24229	1.98438			

Given the t-value of -0.097, $df=116$ and $p\text{-value}=0.923>0.05$, the result of the independent sample t-test shows that there is no difference in the testing competency level of in-service secondary school teachers base on gender. Hence, the null hypothesis was not rejected and it was therefore concluded that there is no difference in the testing competency level of in-service secondary school teachers base on gender.

Research Hypothesis Two: There is no significance difference in the testing competency level of in-service secondary school teachers base on their year of teaching experience.

To test this research hypothesis, the data were subjected to One-Way Analysis of Variance (ANOVA) using year of teaching experience as a grouping variable. The result of the ANOVA results are presented in Table 5 below.

Table 5: One-Way Analysis of Variance (ANOVA) showing difference in the testing competency level of in-service secondary school teachers base on their year of teaching experience

	Sum of Squares	df	Mean Square	F	p-value
Between Groups	1391.470	5	278.294	1.409	.227
Within Groups	22128.098	112	197.572		
Total	23519.568	117			

Given the F-value of 1.409, $df(2, 112)$ and $p\text{-value}=0.227>0.05$, the result of the ANOVA shows that there is no difference in the testing competency level of in-service secondary school teachers base on their year of teaching experience. Hence, the null hypothesis was not rejected and it was therefore concluded that there is no difference in the testing competency level of in-service secondary school teachers in Kwara base on their year of teaching experience.

3.5. Discussion

The study revealed that the most commonly held test construction skills among in-service secondary school teachers include the ability to "consult standard textbooks in the subject for guidance," provide "clear instructions to guide the test items," frequently "submit items for vetting to the head of department or principal," and "write tests that are comprehensible to both high and low achievers." Nevertheless, the most deficient skills include the inability to "Avoid gender stereotypes in test items" during the test development phase, "Restrict essay tests to high-level objectives," and a lack of comfort in providing students with test items for grading, among others. This indicates that they typically formulate questions based on their textbooks and have them reviewed by their head of department or principal. The school practices typically instill these specific skills in students, as they are inherently linked to the test construction administrative guidelines established by their respective institutions. The findings indicate a significant level of testing proficiency among in-service secondary school teachers in the state. They, however, require training in the following areas related to the ability to: conduct item analysis, compose flawless test items, and develop effective scoring rubrics/marketing guides. Development of Test Blueprint among related entities. Tagele and Bedilu (2015) evaluated the competence of secondary school teachers in the educational assessment of students in the Amhara National Regional State of Ethiopia and determined that these teachers lacked proficiency in this area. Tagele and Bedilu (2015) found that individuals who completed a distinct course in measurement and evaluation during their training achieved statistically significant higher scores compared to those who did not undertake such a course. Therefore, prioritizing the training of prospective teachers in student assessment is essential, along with the necessity of developing in-service training programs to improve their testing competencies in schools. Adeosun and Mogokwu (2024) examined teachers' proficiency in test construction within senior secondary schools in the Ovia North-East local government area of Edo State, revealing that teachers in this region possess a high level of competency in test construction.

The results of the tested hypotheses indicated that there is no disparity in the testing competency levels of in-service secondary school teachers based on gender, nor is there a difference based on years of teaching experience. This may result from teachers being proficient in managing student achievement testing activities due to their educational training levels. Adeosun and Mogokwu (2024) found a significant difference in test construction competency among teachers based on gender, whereas no significant differences were observed concerning teachers' competency based on qualifications and years of experience. This finding contradicts Adodo's (2014) study conducted in Ondo State, Nigeria, which indicated no significant relationship between teachers' qualifications and their capacity to ascertain the objectives of the Basic Science and Technology (BST) test, as this ability is a crucial component of achievement testing activities. Adodo (2014) also found that the teacher's qualifications do not affect the development of the table of specifications. Furthermore, educators with extensive teaching experience are likely to acquire more effective methods for assessing student achievement and related testing activities in educational institutions. Dosumu (2002) asserted that a teacher's experience correlates with an enhanced understanding and appreciation of essential test construction skills. Likewise, a teacher with more years of experience in CA will possess superior skills compared to one with fewer years of experience (Odili, 2014). In contrast to the aforementioned finding, Adodo (2014) revealed a significant difference between teachers' teaching experience and their competency in evaluating students' cognitive achievement, with novice teachers outperforming their more experienced counterparts in this regard. Silker (2003) observed that years of experience significantly influence the validity of teacher-made tests. Adodo (2014) similarly found no significant difference between teachers' gender and their competency in assessing the Continuous Assessment (CA) in Basic Science and Technology.

4. Conclusion and Recommendations

It was concluded that there is a high level of testing competency among the in-service secondary school teachers in the state with no significant difference in the testing competency level of in-service secondary school teachers in Kwara state base on gender and their year of teaching experience. Based on the results obtained, therefore, the following recommendations were made;

1. There should be regular in-service training for teachers to update their assessment skills as well as teachers are encouraged continually apply the assessment skills appropriately in their teaching endeavours within the education system.
2. Test items must align with course content and instruction to guarantee content validity, represent a sufficient sampling of instructional materials to enhance test reliability and validity, and promote higher-order thinking skills. Educators ought to revise and enhance teacher-created assessments utilizing test statistics and item analysis.
3. There is a need for a standard instrument that will be used to identify teachers with poor test construction skills so that in-service training will be organised for them.
4. In-house seminars, workshops and conferences may also be held on different areas of teacher competence specifically on classroom testing. All these knowledge-sharing programmes will provide information that could relate to basic principles of test planning, construction and administration to contribute to an improvement in the content validity of the achievement tests.
5. Classroom teachers should ensure that test items constructed are representative of course content. And there should be need to develop table of specification before constructing achievement test.

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