

Evaluation of Science Teachers' Qualification and Knowledge in Test Construction Procedures at Senior Secondary Education Level in Plateau State, Nigeria

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ABSTRACT

The study examined science teachers' qualification and knowledge in test construction procedures at senior secondary education level in Plateau state, Nigeria. The research was guided with five research questions and three hypotheses. The study adopted a descriptive survey research design. The population of the study consisted of all students from public and private secondary schools in Plateau state, Nigeria. A sample of 450 respondents was selected using the stratified sampling technique such that thirty (30) schools were selected from each of the Senatorial Zones of plateau state, giving a total of ninety (90) schools. Only science teachers were drawn for the purpose of this research. Data for the study was collected using a self-designed questionnaire by the researchers and validated by three experts in test and measurement. The reliability coefficient of 0.77 was obtained using Cronbach Alpha Method. The data collected were analyzed using mean score to provide answer the research questions, while ANOVA and t-test of independent sample were used to test the hypotheses at 0.05 level of significance. The results revealed that science teachers have knowledge of test construction but inadequately employing the test construction procedures in the construction of teacher-made achievement test. The study also found that qualification and years of teaching experiences have impact on the knowledge of test construction procedures. However, gender is not significant in the knowledge and procedures employed in construction of classroom achievement test. Recommendations were made for policymakers, educational administrators, and teacher training institutions to address some of the inadequacies to promote quality science education in Plateau State.

Key words: Science Teachers 'Qualification, Knowledge of Test Construction Procedures, Secondary Education, Plateau State, Nigeria.

INTRODUCTION

Teachers at all levels of education are major stakeholders in the evaluation of students, and it is important to examine their knowledge and ability in test item development. Salomo and Sammy-King (2017) suggested that to attain the required twenty-first century standards of learning, teachers must be effectively trained and supervised in classroom test construction procedures. They emphasized the important role teachers play in enhancing the quality of student learning process and therefore should be skilful enough to construct and administer quality tests that enhance teaching and learning. Assessment is the acknowledged method, to test the quality of learning of the students which in turn indicates the quality of the programme (Odiagbe, 2012).

Schools show their qualities through the progress their students have made in assessment results. Without assessment, it will be difficult to establish the quality of students and their schools' progress in academic achievements. It also means that decisions could only be made about students and schools after assessments

have taken place. This implies that the faulty and poor assessment procedures will certainly lead to wrong conclusions about students and schools. Delong and Adamu (2018) see assessment as a carefully considered opinion about a person. For an assessment to be carried out, testing must be involved. Anikweze (2013) described a test as an examination of the nature or value of a thing or the method used in making such an examination. Testing can, therefore, be viewed as a set of tasks administered to a person. How the person performs depends on the possession of a particular body of knowledge and skill. The Federal Republic of Nigeria (2013) stated that continuous assessment is an evaluation process where students are systematically appraised across three key areas - cognitive (knowledge), affective (attitudes and values), and psychomotor (practical skills) - over a specified period during their academic tenure. Such an assessment is for the purpose of guiding and improving the learning and performance of the students.

The quality of science education at the senior secondary level is crucial for producing competent scientists, technologists, and innovators who can drive national development (Adeyemi, 2017 & Oyedemi, 2019). Effective science education relies heavily on well-qualified teachers who possess adequate knowledge and skills in test construction procedures (Esiobu, 2012 & Ogunniyi, 2011). Teachers' qualifications and expertise in test construction are critical factors influencing the validity and reliability of assessment outcomes (Crooks, 2002; Kane, 2006). Designing a test is a complicated and elaborate process. It involves a lot of aspects, first of which requires test items to address the content of the subject matter, it is equally possible with the aid of table of specification, to minute attention to the finishing touches such as instructions and the duration of the test as to not put a blemish on the credibility and reliability of the test. A good test will be able to provide quality feedback on the intended construct; and in order to determine whether the items used to build are of high quality, they must be analysed in terms of their difficulty and how well they are able to distinguish or discriminate between the pupils (Odiagbe, 2012).

In Nigeria, science education has been plagued by poor student performance, particularly in external examinations such as the West African Senior School Certificate Examination (WASSCE) (WAEC, 2020). Research suggested that science teachers' lack of proficiency in test construction procedures contributes significantly to this problem (Ogunniyi, 2011 and Adeyemi, 2017). Studies have shown that teachers' qualifications, experience, and training in test construction procedures are essential for ensuring the quality of assessments (Kane, 2006; Madaus & O'Dwyer, 1999). In a study by Darryl (2023), it was revealed that there exists a significant relationship between their age and expertise in assembling the test, and between and among their number of years in teaching and knowledge in developing test specifications, selecting appropriate item types and preparing relevant items. Thus, teachers have a good understanding of the objective test construction procedure. Similarly, teachers' qualifications, values, and attitudes toward students and the teaching professionalism are critical to the success of any educational program (Rabanal, 2016).

To this end, based on the literature, it has become axiomatic that teachers' competence in teacher-made classroom assessment is critical to the attainment of educational quality. Thus, examining assessment literacy amongst teachers for the purpose of improving students' learning outcomes is deemed worthwhile (Amani et al, 2021). In the study of Opie, Oko-Ngaji, Eduwem and Nsor (2021), the researchers established that, science teachers in secondary schools utilized their knowledge of test construction procedures effectively in setting objective tests; however, they do not subject the students to pre-test or trial test before the main test is carried out. These practices made the question items not stand validity and reliability test for standardization. However, there is a dearth of empirical evidence on the qualifications and knowledge of science teachers in test construction procedures at the senior secondary education level in Plateau State, Nigeria. Plateau State, like other states in Nigeria, faces challenges related to teacher quality, inadequate training, and insufficient resources (Nigerian Education Sector, 2018). A study by Ajewole (2019) revealed that science teachers in Plateau State lack the necessary skills and knowledge in test construction procedures. In another dimension, Eni, Riposting and Opie (2020), in their study of the assessment practices of lecturers in a higher institution in Nigeria, showed that there was a remarkable abuse of show of incompetency in test item development among the lecturers. Despite the critical role of science teachers in promoting quality science education, there is a growing concern about the qualifications and knowledge of science teachers in test construction procedures at the senior secondary education level in Plateau State. The poor performance of students in science subjects in external examinations, coupled with the lack of empirical evidence on science teachers' qualifications and

knowledge in test construction procedures, necessitates an investigation into this issue. Therefore, this study aims to investigate the impact of qualifications and knowledge of science teachers in test construction procedures in senior secondary schools in Plateau State. Further more the study considered gender impact and year of experiences of science teachers on knowledge test construction procedures.

The following objectives are intended to be achieved in the research:

1. To determine science teachers' qualifications and knowledge of test construction procedures in classroom achievement tests in Plateau State, Nigeria.
2. Find out the procedures employ by science teachers in constructing classroom achievement tests
3. Determine whether there is any effect of gender on test construction procedures of teacher-made achievement tests
4. To determine the extent to which science teachers' qualifications can influence their knowledge and skills of test construction procedures in Plateau state, Nigeria.
5. Find out science teachers' location on their knowledge and skills for test construction procedures of teacher-made achievement tests

Research Questions

The following research questions were raised in the study

1. What is the knowledge of science teachers in construction of teacher-made achievement test?
2. What are the procedures employed by science teachers in constructing classroom achievement tests?
3. To what extent do male and female science teachers employ test construction procedures in classroom achievement test in secondary schools in plateau state differ?
4. What is the impact of science teacher's qualifications and years of experience on the knowledge of classroom achievement test construction procedures?
5. What is the impact of science teacher's location on their knowledge of test construction procedures of teacher-made achievement tests?

Research Hypotheses

The following null hypotheses guided the conduct of the study

1. There is no significant impact of science teacher's qualifications and Experience on knowledge of test construction procedures of teacher-made achievement tests.
2. There is no significant difference in the mean scores of male and female sciences teachers in test construction procedures of teacher-made achievement tests.
3. There is no significant difference between the mean scores of rural and urban science teachers in knowledge of test construction procedures of teacher-made achievement tests.

RESEARCH METHODOLOGY

The study adopted a descriptive survey research design. The population of the study consisted of all the public and private secondary schools in plateau state, Nigeria. A stratified sampling technique was adopted for the purpose of carrying the selection of sample for the study. Thirty (30) schools were selected from each of the Senatorial Zones of plateau state, Nigeria. A total of ninety (90) schools were sampled for the study. Only science teachers were drawn for the purpose of this research. In each school 5 questionnaires were administered giving a total of four hundred and fifty (450) respondents. Data for the study was collected using a self-designed questionnaire. It was in two-sections. Section A asked for name of school, years of service, qualification and sex, while section B contained questions and statements on science teacher's knowledge on test construction procedures at senior secondary education level in plateau state, Nigeria. The data collected was analyzed using frequency distribution and mean score to answer research questions and t-test of

independent sample was used to test the hypotheses at 0.05 level of significance. The instrument was developed by the researchers and validated by three experts in test and measurement. The experts ascertained the face and content validity of the instrument. The reliability coefficient of 0.77 was determined using Cronbach Alpha Method. The instrument was administered with the aid of the research assistants. A face-to-face method of administration was used to ensure maximum return of the questionnaire.

RESULTS

Research Question 1: What is the knowledge of science teachers in construction of teacher-made achievement test?

Table 1: Mean Response on Knowledge of Science Teachers in Construction of Achievement Test

s/n	Knowledge in construction of teacher-made achievement test	SA	A	UN	D	SD	Mean	Decision point
1	Purpose of the test is specified and stated before the construction of test	209	198	12	23	8	4.28	Accepted
2	There is a clear learning objective and framework for test items in relation to instructional objectives.	157	221	48	17	7	4.12	Accepted
3	The Bloom's Taxonomy are used to categorize test item questions based on the cognitive level	172	202	47	18	11	4.12	Accepted
4	Number of test item questions are outlined per lesson content areas as specified in test blue print	175	207	38	23	7	4.16	Accepted
5	Variety of test question types is used in test construction (e.g., multiple-choice, short-answer, essay).	166	181	69	28	5	4.06	Accepted
6	Test instructions and expectations are clearly communicated test to students	108	263	44	29	6	3.97	Accepted
7	Test items are preliminarily administered to ensure test validity and reliability in measuring student learning.	126	198	60	37	28	3.80	Accepted
8	Test items are arranged in respect of difficulty level derived from item analysis.	129	220	54	29	18	3.92	Accepted
9	Test items are considered with good discriminatory abilities among the students in the classroom	129	235	50	22	14	3.98	Accepted
10	Peer review and feedback mechanism are adequately used to in test construction	154	213	43	26	14	4.04	Accepted
	Overall Mean						4.05	

The table 1 presents mean ratings of science teachers’ participants in the study on knowledge of construction of teacher-made achievement test. Ten question items were presented to the respondents; all the question items were accepted based on 3.00 decision point set in the study. The accepted items include, specifying the test purpose, utilization of specification table, variety of test question type, communication of test expectations among others. The overall mean obtained was 4.05 which imply that science teachers have knowledge of constructing teacher made achievement test in secondary schools in Plateau state.

Research Question Two: What are the procedures employed by science teachers in constructing classroom achievement tests?

Table 2: Mean Response on Procedure Employed in Test Construction

s/n	Procedure employed in construction of classroom achievement test	SA	A	N	D	SD	Mean	Decision point
1	There is consideration for diverse need of students when constructing tests questions	151	220	34	35	10	4.08	Accepted
2	Test constructed are trial tested for adequate feedback and students’ performance behaviour	162	203	51	24	9	4.02	Accepted
3	Table of specification are designed and utilized for distribution of test item across contents and cognitive level	136	218	65	19	9	3.94	Accepted
4	Test rubrics are used to assess students’ performance on complex tasks.	158	176	67	20	27	3.92	Accepted
5	Open-ended questions are included in the test items constructed for higher-order thinking.	123	222	61	28	14	4.00	Accepted
6	The use technology-enhanced items are made available (e.g., simulations, multimedia) in tests.	165	177	61	35	12	3.92	Accepted
7	There is adequate security of test questions paper and maintain student confidentiality.	158	171	65	31	23	3.96	Accepted
8	Timely and constructive feedback are provided to students for further improvement in their learning capacity	139	214	53	23	20	4.02	Accepted
9	Test data are used to inform instruction and adjustment of teaching strategies.	165	175	72	21	15	4.07	Accepted
10	Tests are evaluated for effectiveness in meeting the set broad objectives of education	173	181	64	17	15	2.54	Rejected
	Overall mean						3.85	

The table 2 above presents the frequency and the mean response on the procedure employed by science teachers in construction of classroom achievement test. Ten (10) construction method items were presented to

the respondents in the study; nine of the procedure was accepted based on the 3.00 decision point set in the study by science teachers in construction of classroom achievement test. Some of the procedures accepted include consideration of diverse need of the learners, trial testing of the test items, the use of open-ended questions, the use of specification table, use of rubrics among others. However, evaluation of test in meeting the set broad objectives of education was rejected. The overall mean rating of the procedures employed in construction of classroom achievement test was 3.85 indicating the extent at which science teachers employed the presented achievement test construction procedures within the classroom. The extent was rated slightly above average in the use of the presented achievement test construction procedures; this therefore called for further improvement and strict adherence to the test construction procedures.

Research Question Three: To what extent do male and female sciences teachers employ test construction procedures in classroom achievement test in secondary schools in Plateau state differ?

Table 3: Mean Response on Knowledge of Test Construction based on Gender

s/n	Procedures employ in construction of achievement test	Gender	N	Mean	Decision point
1	Test items are evaluated for effectiveness in measuring the stated behavioural objectives	Male	285	4.03	Accepted
		Female	165	4.05	Accepted
2	There is consideration for diverse need of students when constructing tests questions	Male	285	4.05	Accepted
		Female	164	4.13	Accepted
3	Test constructed are trial tested for adequate feedback and students' performance behaviour	Male	284	3.99	Accepted
		Female	165	4.08	Accepted
4	Table of specification are designed and utilized for proper distribution of test item across content and cognitive level	Male	285	3.90	Accepted
		Female	165	4.01	Accepted
5	Test rubrics are used to assess students' performance on complex tasks.	Male	283	3.94	Accepted
		Female	165	3.89	Accepted
6	Open-ended questions are included in the test items constructed to assess higher-order thinking.	Male	285	3.99	Accepted
		Female	165	4.00	Accepted
7	The use technology-enhanced items are made available (e.g., simulations, multimedia) in tests.	Male	285	3.94	Accepted
		Female	165	3.90	Accepted
8	There is adequate security of test questions paper and maintain student confidentiality.	Male	285	3.95	Accepted
		Female	165	3.98	Accepted
9	Timely and constructive feedback are provided to students for further improvement in their learning capacity	Male	285	4.01	Accepted
		Female	165	4.05	Accepted
10	Test data are used to inform instruction	Male	285	4.07	Accepted

	and adjustment of teaching strategies.	Female	165	4.05	Accepted
	Overall mean	Male	285	3.99	Accepted
		Female	165	4.01	Accepted

The table 3 above presents the mean rating difference on the extent at which male and female science teachers employed test construction procedure in the study. Ten question items were presented to the participants in the study. The ten question items were accepted based on the 3.00 decision point set in the study. The accepted procedures employed include, evaluation of test in measuring the stated educational objective, diverse needs of the students considered, trial testing of the items and use of rubrics among others. The overall mean rating of male and female science teachers was 3.99 and 4.01 respectively with slight differences of 0.02. Hence the result revealed that both male and female science teachers in the study had the knowledge and employed test construction procedures to an average extent based on the mean ratings obtained but not to optimum usage.

Research Question Four: What is the impact of science teacher’s qualifications and years of experience on the knowledge of classroom achievement test construction procedures?

Table 4: Mean Response on Impact of Teacher’s Qualification and experience on the Knowledge of Construction of Classroom Achievement Test

s/n	Knowledge of Construction of Classroom Achievement Test	NCE	HND	BED	PGDE	Above
	Number of Science Teachers	317	16	64	44	9
1	Purpose of the test is specified and stated before the construction of test	4.08	4.25	3.82	3.94	3.89
2	There is a clear learning objective and framework for test items in relation to instructional objectives.	4.07	4.56	3.95	4.14	3.89
3	The Bloom's Taxonomy are used to categorize test item questions based on the cognitive level	3.99	4.31	3.95	4.13	4.22
4	Number of test item questions are outlined per lesson content areas as specified in test blue print	4.02	4.19	3.73	3.63	4.22
5	Variety of test question types is used in test construction (e.g., multiple-choice, short-answer, essay).	3.97	4.25	3.80	3.72	3.44
6	Test instructions and expectations are clearly communicated test to students	4.06	4.13	3.98	3.67	4.00
7	Test items are preliminarily administered to ensure test validity and reliability in measuring students learning.	3.98	4.25	3.57	3.80	3.89
8	Test items are arranged in respect of difficulty level derived from item analysis.	3.99	3.94	3.82	3.92	3.89
9	Test items are considered with good discriminatory abilities among the students in the classroom	4.08	4.06	3.75	3.89	4.22

10	Peer review and feedback mechanisms are adequately used to in test construction	4.14	4.19	3.91	3.75	4.44
	Overall mean	4.04	4.21	3.83	3.86	4.01

The table 4 above presents the mean response on the impact of science teachers’ qualification in knowledge of classroom achievement test construction procedures in the study. The result revealed that all the categories of science teacher qualification that participated in the study had an overall mean scored above 3.00 decision point. Therefore, this implies that the science teachers accepted that teachers’ qualifications have impact on the knowledge of constructing classroom achievement test. Therefore, the knowledge and procedure of constructing classroom achievement test is affected by the teachers’ qualification as well as their years of experience in the teaching profession.

Research Question Five: What is the impact of science teacher’s location on their knowledge of test construction procedures of teacher-made achievement tests?

Table 5: Mean Response of Science Teachers on Knowledge of Test Construction Procedures based on Location

1	Knowledge of test construction based on school location	Location	N	Mean	Decision point
		Urban	212	4.15	Accepted
2	There is consideration for diverse need of students when constructing tests questions	Rural	237	3.98	Accepted
		Urban	212	4.19	Accepted
3	Test constructed are trial tested for adequate feedback and students’ performance behavior	Rural	237	3.96	Accepted
		Urban	212	4.09	Accepted
4	Table of specification are utilized for distribution of test items across contents and cognitive level	Rural	238	3.89	Accepted
		Urban	212	4.00	Accepted
5	Test rubrics are used to assess student performance on complex tasks.	Rural	237	3.96	Accepted
		Urban	211	3.88	Accepted
6	Open-ended questions are included in the test items constructed to assess higher-order thinking.	Rural	238	3.90	Accepted
		Urban	212	4.10	Accepted
7	The use technology-enhanced items are made available (e.g., simulations, multimedia) in tests.	Rural	238	3.80	Accepted
		Urban	212	4.07	Accepted
8	There is adequate security of test questions paper and maintain students’ confidentiality.	Rural	238	3.87	Accepted
		Urban	212	4.06	Accepted
9	Timely and constructive feedback are provided to students for further improvement in learning capacity	Rural	238	3.88	Accepted
		Urban	212	4.18	Accepted

10	Test data are used to inform instruction and adjustment of teaching strategies.	Rural	238	3.93	Accepted
		Urban	212	4.22	Accepted
	Overall Mean	Rural	238	3.91	
		Urban	212	4.09	

The table 5 presents the mean response on the impact of science teacher’s location on knowledge of test construction procedures of teacher-made achievement tests. Ten question items were presented to the participants in the study. All the question items were accepted based on 3.00 decision point. The overall mean for science teachers in urban area was 4.09 while their rural area counterpart was 3.91. The result revealed that science teachers’ locations have some impact on the science teachers’ knowledge of teacher-made achievement test construction procedures.

Testing of Hypotheses

Hypothesis One: There is no significant impact of science teacher’s qualifications and Experience on knowledge of test construction procedures of teacher-made achievement tests.

Table 6: ANOVA Test Result on the Impact of Qualification and Experience on Knowledge of Test Construction Procedures

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Intercept	795.705	1	795.705	17065.421	.000
Error	.420	9	.047		

The table 6 above presents the analysis of variance test result on the significant impact of science teacher’s qualifications and experience on knowledge of test construction procedures of teacher-made achievement tests. The hypothesis was rejected since the p-value of 0.00 was less than the 0.05 significance level. Therefore, it was concluded that, there is significance impact of science teacher qualification and experience on the knowledge of test construction procedures of teacher-made achievement test.

Hypothesis Two: There is no significant difference in the mean scores of male and female sciences teachers in test construction procedures of teacher-made achievement tests.

Table 7: t-test Result on the Significant difference between male and Female Science teachers in test construction procedures

Gender	N	Mean	Std. Dev	T	Df	Sig (p-value)
Male Science Teachers	285	4.01	.100	.201	448	.843
Female Science Teachers	165	4.01	.076			

The table 7 above presents the t-test result on the significant difference in the mean scores of male and female sciences teachers in test construction procedures of teacher-made achievement tests. The hypothesis was accepted since the p-value of 0.843 was greater than the 0.05 significant level. Therefore, it was concluded that there is no significant difference in the mean score of male and female science teachers in test construction procedures of teacher-made achievement test.

Hypothesis Three: There is no significant difference between the mean scores rural and urban science teachers in knowledge of test construction procedures of teacher-made achievement tests.

Table 8: t-test Result on the Significant Difference in the Mean scores of Rural and Urban Science Teachers in Knowledge of Test Construction

Location	N	Mean	Std. Dev	T	Df	Sig (p-value)
Rural Area Science Teachers	238	3.91	.054	5.047	448	.000
Urban Area Science Teachers	212	4.09	.101			

The table 8 above presents the t-test result on the significant difference in the mean scores of rural and urban area science teachers’ knowledge of test construction procedures of teacher-made achievement test. The hypothesis was rejected since the p-value of 0.00 was less than the 0.05 significant level. Therefore, it was concluded that there is significant difference between the mean scores of rural and urban area science teachers in knowledge of test construction procedures of teacher-made achievement test.

DISCUSSION OF RESULTS

The research question one of this study found that, science teachers in Plateau state studied possessed knowledge of constructing teacher made achievement test in secondary schools in the state. This finding agreed with Opie, Oko-Ngaji, Eduwem and Nsor, (2021) who found that science teachers studied, utilized their knowledge of test construction procedures effectively in setting objective tests; however, they do not subject the students to pre-test before the main test is carried out. But disagreed with Ajewole (2019) who revealed that science teachers in Plateau State lack the necessary skills and knowledge in test construction procedures. However, the evaluation of test in meeting the set broad objectives of education were not been done which further corroborated the work of (Opie, Oko-Ngaji, Eduwem and Nsor 2021).

The research question two established that science teachers do employ test construction procedures in constructing classroom achievement test but inadequately employed or practiced since the rated mean response was slightly above average, indicating that the procedures are not totally adhere to the test construction. This finding agreed with (Ogunniyi, 2011 and Adeyemi, 2017) who found that, science teachers' lack of proficiency in test construction procedures and it contributed significantly to this problem in teaching sciences. Their report showed that only few teachers reportedly using a table of specifications to guide their test construction. This also aligns with Oludipe (2012), who found that Nigerian science teachers rarely used table of specifications in test construction. The science teachers know what is expected in test construction but they are in capacitated to completely follow the procedure this may be due to other conditions which can be established but beyond the objectives of this present study.

The research question three revealed that both male and female science teachers studied had some knowledge of test construction and procedures in test construction to an average level but not sufficient enough. The hypothesis tested further established that, there is no significant difference between male and female science teacher’s knowledge in test construction and procedures employed in teacher-made achievement test. Both genders exhibit similar knowledge in test construction and usage of test procedures which seems not up to optimum this corroborated the study of Adeyemi (2017), who reported that Nigerian science teachers demonstrated inadequate knowledge understanding of test validity and reliability when constructing teacher made-achievement test.

The research question four found that science teacher qualifications have impact on the knowledge of constructing classroom achievement test as well as years of experience in the teaching practice profession. The hypothesis tested established that, there is significance impact of science teachers’ qualification and

experiences on the knowledge of test construction procedures of teacher-made achievement test. The agreed with Darryl (2023), who revealed that, there exists a significant relationship between their age and expertise in assembling the test, and their number of years in teaching and knowledge in developing test specifications. Esiobu, 2012 and Ogunniyi, 2011 who also established that effective science education relies heavily on well-qualified teachers who possess adequate knowledge and skills in test construction procedures. Finally, the study revealed that science teachers' locations have impact on the science teachers' knowledge of teacher-made achievement test construction procedures and there is significant difference between rural and urban area science teachers in knowledge of test construction procedures of teacher-made achievement test in the state.

CONCLUSION

This study examined the knowledge of science teachers on test construction procedures at the senior secondary education level in Nigeria. The findings indicate science teacher possessed knowledge of test construction and to an extent they employed procedures of test construction to develop the teacher made test. However, there is inadequacy in some areas involved in test construction procedures such as validity and reliability of their assessments, assessing if the test constructed meet broad educational objectives. Also, the qualification and years of experience of science teachers, has significant impact on their knowledge and procedures in constructing teacher-made achievement test which ultimately affecting the quality of science education in Plateau state. To improve the quality of science education product in the state, it is essential to address the inadequacy of science teachers' procedures employed in test construction such as not trial testing to ensure validity and reliability of the test items and ensuring the items are in conformity with broad educational objectives of the state.

RECOMMENDATIONS

1. Government should employ professionals to organize regular workshops and training programs for science teachers to update their knowledge and skills in test construction procedures.
2. Comprehensive courses on test construction and assessment techniques for pre-service teachers should be integrated as part of professional development in teacher education programmed.
3. Schools' administrators should pair experienced educators as mentorship program with novice teachers to provide guidance and support in test construction.
4. Resource Materials should be provided for science teachers, such as textbooks and online tools, to support test construction both in the rural and urban center.
5. Educational authorities should develop and implement policies programmed that prioritize teacher capacity building in assessment and evaluation and ensure thorough assessment of the teacher-made achievement test, before administering the test each term.

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