



ASSESSMENT OF TEST CONSTRUCTION KNOWLEDGE AND COMPETENCY AMONG SENIOR SECONDARY SCHOOL TEACHERS OF MATHEMATICS IN GOMBE STATE

Alabi, Mutiu Ayofe (PhD)

Department of Education Foundations,
Federal University of Kashere, Gombe State.
08106231595
dralabima@gmail.com

And

Musa Fada

Department of Education Foundations,
Federal University of Kashere, Gombe State.
08071451578
isamusafada@gmail.com

Abstract

This study investigated the knowledge and competency of senior secondary school teachers of mathematics in test construction in Gombe State, Nigeria. Specifically, this study explored the relationship and difference between test construction knowledge and competency of teachers. The study adopted a descriptive survey research design, targeting the entire population of 212 mathematics teachers in public senior secondary schools. Data were collected using Mathematics Teachers Test Construction Knowledge and Competency Scale (MTTCKCS), which was validated for content and face validity and demonstrated acceptable reliability (Cronbach's alpha: 0.825 for knowledge, 0.690 for competency, and 0.624 overall). Descriptive and inferential statistics, t-tests, and correlation analysis were employed to answer the research questions and test the hypotheses at a 0.05 level of significance. The findings revealed differences in test construction knowledge and competency were observed between teachers in rural and urban schools, with knowledge tending to increase while competency decreased in rural settings. A significant relationship was found between test construction knowledge and competency. The study recommends regular training, workshops, and seminars for teachers, equitable access to resources across rural and urban schools, and the use of digital tools to enhance test construction proficiency. These measures are essential to improve the overall quality of mathematics assessment in senior secondary schools in Gombe State.

Keywords: Test construction, Knowledge, Competency, Mathematics

Introduction

The primary aim of assessment is to improve student learning. Assessment entails the use of methods and tools by educators to measure the level of students' learning on different activities. According to Yambi (2020), assessment refers to a related series of measures used to determine a complex attribute of an individual or group of

individuals. This involves gathering and interpreting information about student level of attainment of learning objectives. It is the process of systematically gathering information as part of an evaluation. Assessment is carried out to see what children and young people know, understand and are able to do. This means that



assessment deals with various ways of understanding the achievement of learners. As teachers are primarily responsible for evaluating instruction and student learning, there is a widespread concern about the quality of classroom assessment. In order to be used as tools for students' learning, classroom assessments must be transformed in two fundamental ways: first, the content and character of assessments must be significantly improved; and second, the gathering and use of assessment information and must become part of an ongoing learning process (Kenneth, 2022). It is a known fact that classroom assessment is not just for generating information for decision-making but also to foster learning improvement. Therefore, if properly executed frequently, it will help students refine and improve their understanding of what they learn. Competency in test construction is a necessary tool needed by every teacher if learning and instructional objectives are to be effectively attained. Since the effectiveness of learning goals, entrenched in the curricula of a school continues to be the most fundamental sign of institutional superiority, educational development, and individual goals, teachers need to have adequate knowledge to achieve these learning objectives in an accurate and precise manner. They must thus be skilled in both the science and the art of test construction. This means that teachers' effective grasp of assessment as a concept in education is critical to the achievement of instructional objectives. Scholars admit that in practice, some teachers are faced with challenges as they develop either formative or summative assessments (Kenneth, 2022).

Test construction is an important part of assessing the level of students' understanding of instruction. The knowledge of test construction entails skills acquired through experience or education on the procedure or

processes of creating valid and reliable test items. Creating qualitative test items give teachers confidence that scores obtained reflect students' mastery of essential skills or knowledge. Quality test items are not constructed overnight; there is need for test construction knowledge and competency. The knowledge of test construction entails skills acquired through experience or education on the procedure or processes of creating valid and reliable test items. Test construction knowledge refers to the understanding and expertise required to effectively design, develop, and construct assessment or tests. The knowledge of test construction enables teachers to construct tests that have high content validity with the aid of Table of Specifications (TOS). It is a plan or guide for test preparation because it clearly states the number of questions to be asked on each topic or course unit, type of questions, recall of facts; comprehension, application etc.

On the other hand, test construction competency refers to the proficiency and expertise demonstrated by an individual in designing, developing, and constructing valid and reliable assessments or tests that accurately measure the targeted knowledge, skills or attributes of test-takers. Competency-based assessments aim to measure a person's proficiency in a specific area. Test construction in mathematics involves creating assessments to evaluate students' understanding of Mathematical concepts and their problem-solving skills. It's important to ensure that the test questions align with the learning objectives and cover a wide range of topics and difficulty levels. Consider using a mix of question types, such as multiple-choice, short answer, and problem-solving questions, to assess various skills. In addition, make sure the questions are clear, concise and free of ambiguities to accurately measure students' Mathematical



knowledge. Trained teachers in Nigerian Secondary schools tend to construct various effective evaluative instruments more than those posing to be experienced teachers, Nenty (2017). This shows the advantage that the trained teachers have over the untrained because of the disparity in knowledge. Popham (2019) argued that the more experienced a teacher (any teacher who has taught in senior secondary school for ten years and above) is, the more he begins to understand, to appreciate and use some important test construction skills. Teachers also construct tests to find out the problem areas of students in specific subjects or topics treated like in other jurisdictions, studies have reported that teachers are trained in assessment and that years of experience may be a significant factor that affect test construction.

Mathematics is one of the senior secondary school core subjects. Mathematics developed as a result of Man's efforts to solve problem of the day. It plays a greater role in the development of any society. Because mathematics is science of quality of space, it is a systematized or organized abstract branch of science and technology. Hence, it requires a systematic assessment to ascertain students' basic knowledge, skills, and understanding of the concepts. In view of all these facts, there is need for the researcher to delve into what is obtained in the public senior secondary schools in Gombe state in order to ascertain the extent of the test construction knowledge and competency of the senior secondary school teachers of mathematics in the state.

Statement of the Problem

The construction of tests represents a fundamental aspect of the educational system, as it directly influences the teaching and learning process. Properly designed assessments serve as tools for measuring

students' understanding, identifying learning gaps, and guiding instructional strategies. In contrast, poorly constructed tests can misrepresent students' abilities, hinder effective learning, and ultimately affect overall academic achievement. Despite its importance, the practice of test construction often receives inadequate attention, which has significant implications for student performance, particularly in standardized examinations.

The absence of proper test construction skills among mathematics teachers has been identified as a key contributor to the persistent poor performance of students in mathematics and other science-related subjects. Inadequate assessment practices not only affect students' immediate academic outcomes but also limit their long-term educational and professional opportunities. This situation highlights the urgent need to systematically evaluate the knowledge and competency of mathematics teachers in public senior secondary schools in Gombe State, Nigeria.

Aim and Objectives of the Study

The main aim of this study is to assess the knowledge and competency of teachers of mathematics in test construction. The specific objectives are to:

1. Determine the relationship between test construction knowledge and test construction competency among senior secondary school mathematics teachers in Gombe State.
2. Find out the difference in test construction knowledge of senior secondary school mathematics teachers based on school location (rural vs. urban) in Gombe State.
3. Assess the difference in test construction competency of senior secondary school mathematics



teachers based on school location (rural vs. urban) in Gombe State.

a. Research Questions

4. Is there a significant relationship between test construction knowledge and test construction competency among senior secondary school mathematics teachers in Gombe State?
5. What is the difference in test construction knowledge of senior secondary school mathematics teachers based on school location (rural vs. urban) in Gombe State?
6. What is the difference in test construction competency of senior secondary school mathematics teachers based on school location (rural vs. urban) in Gombe State?

Hypotheses

Ho₁ There is no significant relationship between test construction knowledge and test construction competency among senior secondary school mathematics teachers in Gombe State.

Ho₂ There is no significant difference in test construction knowledge between rural and urban senior secondary school mathematics teachers in Gombe State.

Ho₃ There is no significant difference in test construction competency between rural and urban senior secondary school mathematics teachers in Gombe State.

Empirical Basis of the study

Muhammad (2023) assessed test construction knowledge of senior secondary school teachers in Ungogo Local Government Area of Kano State, Nigeria. To achieve this objective, the descriptive research design was adopted for the study. A population of 260 comprising the entire senior secondary school teachers in the local government was

used for the study. Data was obtained through Teachers Test Construction Scale (TTCS) instrument. All the hypotheses raised by the study were tested at 0.05 significance level using SPSS. Findings revealed that no significant difference was found on teachers' knowledge of test construction between male and female teachers, and also, teachers' level of experience. It was concluded that gender and level of experience have no significant effect on teachers' knowledge on test construction in Ungogo.

Kissi, Baidoo-Anu, Eric and Annan-Brew (2023) explored the relationship between multiple choice test construction competence and the quality of multiple-choice tests among senior high school teachers in Ghana. In all, 157 teachers were selected from four senior high schools in the Kwahu-South District. Participants responded to self-designed questionnaire developed to assess teachers' multiple-choice items construction competencies. A three-factor structure emanated from the exploratory factor analysis on teachers' multiple choice test construction competence content validity, item "options" handling, and test items assembling. Teachers in this study perceived more competence in ensuring content validity, followed by test item assembling, and handling of "options" (that is, alternatives) of the test items. The study also found serious problems with copies of multiple-choice items teachers have constructed for the students. Findings from this study provide unique and compelling evidence regarding teachers' perceived test construction competence and analysis of their multiple-choice tests.

Shogbesan and Falaye (2020) investigated the effect of test item formats on the construct validity of Mathematics achievement tests in Osun state Secondary Schools. It further determined whether a significant difference



existed in the performance of test-takers across various test formats used in the Mathematics Achievement Test. The study adopted descriptive survey research design. Multi-stage sampling was used to select a sample of 300 Senior Secondary School class two (2) Mathematics students and 36 Teachers of mathematics. The instrument used for data collection was titled 'Mathematics Achievement Test' (MAT) and was validated with alpha reliability coefficient of 0.68. The data collected were analyzed using Principal component analysis, scree plot and one-way analysis of variance. The result showed that there is a significant influence of test item format on the construct validity of Mathematics Achievement Test in Osun State Secondary Schools. Finally, there was a significant difference in the performances of test-takers across various test format. Mathematics Achievement Test used ($F_{4, 1495}=290.25, p<0.05$). The study concluded that test item formats as a facet have an effect on the construct validity of the Mathematics Achievement Test in Osun State Secondary Schools and recommend that test constructors and classroom teachers must understand the characteristics of each format and select the best format which most appropriately serve the purpose of a test in each context.

Akanni (2021) researched on "Assessment of Teacher's Test Construction Competencies on Achievement in Physics among Adolescents in Education District IV of Lagos State, Nigeria". The study examined the assessment of teacher's test construction competencies on achievement in physics among adolescents in Education District IV of Lagos State, Nigeria. The research design was a descriptive survey, the population for the study were all senior secondary II student in Education district IV of Lagos-state. Simple stratified random sampling technique

was used for collection of one hundred and eighty-two (182) students and twenty-one (21) respondents of teachers in Education district. The instruments for the study were a questionnaire titled: Test Construction Skill Inventory (TSCI). Three hypotheses were formulated and tested at 0.05 level of significance. Findings from the study revealed that gender did exert a significant influence on teachers' competencies in test construction skills. That is, there is significant difference between the assessment of male and female teachers' competencies in test construction skills; there is no significant influence of the assessment of teachers' competencies in test construction skills on their academic performance and qualification. It was recommended that school teachers should ensure that they get up-to-date skills set on the culture of test construction that will have influence on students' academic achievement.

A study was conducted on, "Secondary School Teachers' Knowledge on Procedures for Constructing Quality Classroom Tests in Tanzania" by Amani, Kitta, Kapinga and Mbilinyi (2021). The study examined teachers' awareness of skills and procedures for constructing quality classroom tests, established the type of professional support teachers need for constructing quality tests based on the identified areas of deficiency, and determined the influence of experience in the teaching profession on teachers' competences for test construction. It was conducted with a convenient sample of 246 secondary school teachers drawn from four regions in Tanzania, namely Lindi, Mtwara, Kilimanjaro, and Arusha. The study employed a quantitative research approach with the use of semi-structured questionnaires as the data collection tool. Data were analyzed using IBM's Statistical Package for Social Sciences Version 22.0 to compute frequencies, percentages, and other



relevant statistical tests. The findings show that the majority of the participant teachers lacked competences for preparing quality classroom tests, particularly on the use of Table of Specification and test-item analysis. The results showed that more than 70% of the teachers had never received in service training on the subjects of assessment and testing. It was further found that the teachers lacked professional support on how to prepare matching items, short answers, and multiple-choice test items. Based on the findings, the authors recommend strengthening initial teacher education in view of competence-based assessment.

Offiong (2021) carried out a study on “Vocational Teachers’ Characteristics and Test Construction Ability in Technical Colleges in Akwa Ibom State, Nigeria.” Ex-post facto research design was used in conducting the research and 392 teachers were the population of the study. The entire population was used as sample and purposive sampling was used in selecting the participants. A structured questionnaire tagged ‘teachers’ test construction ability questionnaire’ (TconAbility) was used for data collection. The instrument was validated by two experts in the field of educational evaluation and the internal consistency of the instrument was determined using Cronbach Alpha statistics while the reliability coefficient was 0.81. The five hypotheses guiding the study were subjected to testing using independent T-test and analysis of variance (ANOVA). The results of the analysis indicate that; Teachers’ area of specialization, teachers’ years of experience, gender difference, teachers’ qualification, teachers’ professionalism influence their test construction ability in technical colleges of Akwa Ibom State. Based on the findings of the study it was recommended that regular workshops should be set up by the Ministry of Education for teachers among others.

Ahmed, Abdullahi and Bashir (2022) conducted a study on “Assessment of Test Construction Knowledge of Senior Secondary School Teachers in Ungogo Local Government Area of Kano State, Nigeria”. Descriptive research design was adopted for the study. A population of 260 comprising the entire senior secondary school teachers in the local government was used for the study. Data was obtained through Teachers Test Construction Scale (TTCS) instrument. All the hypotheses raised by the study were tested at 0.05 significance level using SPSS. Findings revealed that no significant difference was found on teachers’ knowledge of test construction between male and female teachers, and also, teachers’ level of experience. The study recommended among others that government and other developmental partners should continue to develop the capacity of teachers in the area of test construction through organizing training sessions, workshops and seminars.

Kenneth (2022) investigated a study on Influence of Knowledge of Assessment on Test Construction Skills among Tutors of College of Education in Ghana. The main aim of the study was to explore the influence of tutors’ knowledge in assessment on their test construction skills. The descriptive survey design was used in the study to investigate the predictive relationship between tutor knowledge in assessment and test construction skills. Hundred and fifty (150) tutors were sampled using proportionate stratified sampling technique. The Teacher Knowledge in Assessment Scale (TKAS) and Test Construction Skills Inventory (TCSI) were administered to 150 College of Education (COE) tutors to solicit their views. Descriptive statistics, specifically, mean and standard deviations, and Structural Equation Modelling (SEM) approaches were used to test the study hypotheses. The study's findings revealed



that tutors had a high level of assessment knowledge and test construction skills. Also, tutors' knowledge of assessment was found to significantly predict test construction skills. The study recommended that COE management frequently organize workshops on state-of-the-arts modules of assessment to maintain the knowledge level of tutors among others.

Methodology

The research design that was used for this study is survey research design to study mathematics test construction in Gombe state, Nigeria. The present study is interested in seeking the opinions of teachers of mathematics regarding the problem under investigation. Hence, a survey design is appropriate in achieving the objectives of this study.

The population of the study consists of the entire teachers of mathematics in public senior secondary schools in Gombe state, numbering two hundred and twelve (212) teachers of mathematics according to Gombe state Ministry of education (Education management information system 2023). The teachers are between the ages of 24 – 59 years with the minimum qualification of BSc. as the policy with the ministry of education. And the teachers are teaching in the senior classes of SS1, SS2 and SS3 respectively. In this study, the researcher used the whole 212 Teachers of mathematics as sample size. This is because the population of mathematics teachers was minute enough for the study and did not require any sampling.

The research instrument for data collection was an instrument titled, Mathematics Teachers Test Construction Knowledge and Competency Scale (MTTCKCS) questionnaire which focus on answering the research questions. Therefore, the instrument was designed in structured form requiring the

respondents to tick the answer where appropriate, this is to ensure that the respondent's minds were reverted to the object so as to respond without bias to the questionnaire items. The instrument comprises of three sections. Section A solicited for background information of gender and location. Sections B and C comprises of items arranged in form of Likert scale of Agreed, Strongly Agreed, Disagreed and Strongly Disagreed to assess knowledge and competence respectively. The instrument was validated using face and content validity by two experts in the field of measurement and evaluation. Their observations were considered and necessary corrections were made before the commencement of data collection.

The instrument was trial tested using 30 senior secondary school teachers in Bauchi state. The result obtained was used in determining the reliability of the instrument using Cronbach's alpha from SPSS where test construction knowledge (TCK) $\alpha = 0.825$ and TCC $\alpha = 0.690$. Thus, it yielded a total reliability coefficient value of 0.624. The reliability coefficient is higher enough, then the instrument was considered reliable for the study. The instrument was administered on the respondents after brief explanation on the essence and how to respond to the questionnaire. The questionnaire was collected from the respondents after their responses. The data collected was analyzed using inferential statistics of Pearson's product moment and t-test at 0.05 level of significance.

Results

The result is presented according to research questions and hypotheses raised

**Table 1: Independent Samples Test on test construction competency**

		Levene's Test for Equality of Variances		t-test for Equality of Means					
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference Lower Upper
TCC	Equal variances assumed	.161	.688	-1.661	210	.098	-.55367	.33343	-1.21098 .10363
	Equal variances not assumed			-1.647	103.621	.103	-.55367	.33625	-1.22050 .11315

Table 1, illustrated the hypothesis regarding gender difference on test construction Competency (TCC) of teachers of mathematics which have shown the data not violate equal variance assumption as the significant value at levenes's test is greater than .05 level. Meanwhile, t-value is .688. For assessing differences between male and female, the result shown there is no significant difference between male and female based on their test construction competency (TCC) among teachers of mathematics. This is because the significant value at 2-tailed Colum is above .05 while p-value was =.098, this can be concluded that null hypothesis that "there is no significant difference in test construction competency between male and female of senior secondary school teachers of mathematics in Gombe state" was accepted. Finding from the study shows that senior secondary school teachers

of mathematics in Gombe state both male and female are competent in test construction.

Relationship between Test Construction Competency (TCC) and Test Construction Knowledge (TCK)

RQ3: Is there any relationship between test construction competency and test construction knowledge among senior secondary schools teachers of mathematics in Gombe State?

Table 2 shown the descriptive result of Test Construction Competency (TCC) and Test Construction knowledge (TCK) of teachers of mathematics of teachers of mathematics, where the descriptive involves show no missing value in term of sample (212, 100%) and standard deviation shown 2.606 for TCK while 2.185 for TCC. However, table 7 (correlation) further tests the hypothesis.

Table 2: Descriptive Statistics on TCC and TCK Relationship

	Mean	Std. Deviation	N
TCK	14.0849	2.60556	212
TCC	17.8208	2.18481	212

The study was further tested whether there is statistically significant relationship between Test Construction Competency (TCC) and

Test Construction knowledge (TCK) of teachers of mathematics in table 3.

**Table 3: Correlations Between Test Construction Competency (TCC) And Test Construction Knowledge (TCK)**

		TCK	TCC
TCK	Pearson Correlation	1	.024
	Sig. (2-tailed)		.725
	N		212
TCC	Pearson Correlation		1
	Sig. (2-tailed)		
	N		

Correlation analysis is often employed to examine the strength and direction of relationships between variables. The relationship between test construction competency and test construction knowledge among senior secondary schools teachers of mathematics in Gombe State was investigated using the Pearson product-moment correlation coefficient (r). Preliminary analyses were conducted to ensure that key statistical assumptions—including normality, linearity, and homoscedasticity—were not violated. The results, as presented in the above table, provide an answer to the research question regarding is there any relationship between test construction competency and test construction knowledge among senior secondary schools teachers of mathematics in Gombe State. Findings revealed a significant positive correlation between between test construction competency and test construction knowledge. However, null hypothesis revealed that “there is no significant relationship between test construction competency and test construction knowledge among senior secondary schools teachers of mathematics in Gombe State” was accepted. This is because the Pearson product-moment correlation was conducted to test the relationship between

test construction competency and test construction knowledge. The results revealed a very weak positive correlation between test construction competency and test construction knowledge ($r = .024, n = 212, p < .0005$), suggesting that test construction competency and test construction knowledge required improvement among the senior secondary schools teachers of mathematics in Gombe State.

Location Difference on Test Construction Competency and Test Construction Knowledge

RQ4: What is the difference in test construction knowledge and competency between rural and urban senior secondary school teachers of mathematics in Gombe State?

Table 4a and 4b shown the result of Test Construction Knowledge (TCK) and Test Construction Competency (TCC) of teachers of mathematics of teachers of mathematics where the descriptive involves show there is no missing value in term of sample (212, 100%). Meanwhile, table 8a and 8b have shown the standard deviation revealed TCK (2.796, 2.332) for rural, urban respectively while TCC (2.306, 1.910) for rural, urban respectively.

**Table 4a: Descriptive Statistics on Location Difference of TCK**

	Location	N	Mean	Std. Deviation	Std. Error Mean
TCK	RURAL	123	14.0894	2.79639	.25214
	URBAN	89	14.0787	2.33172	.24716

Table 4b: Descriptive Statistics on Location Difference of TCC

	Location	N	Mean	Std. Deviation	Std. Error Mean
TCC	RURAL	123	17.4634	2.30570	.20790
	URBAN	89	18.3146	1.91047	.20251

Test Construction Knowledge (TCK) and Test Construction Competency (TCC) of teachers of mathematics was further tested on hypothesis of “there is no significant difference in test construction knowledge and

test construction competency between rural and urban senior secondary school teachers of mathematics in Gombe state” table 5a and 9b (Independent sample T-test) further tests the hypothesis.

Table 5a: Independent Samples Test on Test Construction Knowledge

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
TCK	Equal variances assumed	2.607	.108	.030	210	.976	.01078	.36346	-.70571	.72727
	Equal variances not assumed			.031	205.742	.976	.01078	.35308	-.68534	.70690

Table 5a, illustrated the hypothesis regarding rural and urban difference on test

construction knowledge (TCK) of teachers of mathematics

**Table 5b: Independent Samples Test on Test Construction Competency**

		Levene's Test for Equality of Variances		t-test for Equality of Means					
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference
									Lower Upper
TCC	Equal variances assumed	2.251	.135	-2.846	210	.005	-.85119	.29905	-1.44072 -.26166
	Equal variances not assumed			-2.933	206.105	.004	-.85119	.29023	-1.42339 -.27900

Table 5b, illustrated the test on hypothesis regarding location difference on test construction Competency (TCC) of teachers of mathematics.

Overall, both tables have shown data not violate equal variance assumption as the significant value at levene's test is greater than .05 levels. Meanwhile, t-value of TCK and TCC is at .108 and .135 respectively. For assessing differences between TCK and TCC based on rural and urban, the result shown there is significant difference in TCK and TCC between rural and urban among teachers of mathematics. This is because the significant value at 2-tailed Colum is above .05 at TCK (p-value.976) while the significant value at 2-tailed Colum is below .05 at TCC (p-value.005), this can be concluded that null hypothesis of "there is no significant difference in test construction knowledge and test construction competency between rural and urban senior secondary school teachers of mathematics in Gombe state" was rejected. Finding from the study shows that senior secondary school teachers of mathematics in Gombe state both rural and urban are different in term of test construction. Findings further opines that test

construction knowledge improve while the test construction competency decrease when compare the both in rural and urban schools.

Discussion of Findings

Finding from the present study showed that test construction competency and test construction knowledge is require more improvement as there is low relationship between test construction competency and test construction knowledge among the senior secondary schools teachers of mathematics in Gombe State. This is consistent with study by, Kitta, Kapinga and Mbilinyi (2021) where the researcher findings show that the majority of the participant teachers lacked competences for preparing quality classroom tests, particularly on the use of table of specification and test-item analysis. The study of Kissi, Baidoo-Anu, Eric and Annan-Brew (2022) who discovered serious problems with copies of multiple-choice items teachers have constructed for the students is also related to the findings of this study. Findings from this study provide unique and compelling evidence regarding teachers' perceived test construction



competence and analysis of their multiple-choice tests.

Moreover, finding from the study shows that senior secondary school teachers of mathematics in Gombe state from both rural and urban are different in term of test construction while further opines that test construction knowledge improve while the test construction competency decrease when compare the both in rural and urban schools. This finding corroborates the finding of Ahmed, Abdullahi and Bashir (2022) whose study revealed that no significant difference was found on teachers' knowledge of test construction between male and female teachers, and also, teachers' level of experience. This is in line with a study conducted by Khairani (2017) where assessment based on urban and rural teachers' competencies in STEM Integrated Education in Malaysia. The result shows that in most cases, there is no significant difference in teachers' competencies for both urban and their rural counterparts but the research identify that the rural teachers are more competent in organizing co-curricular activities compared to the urban teachers. Also, further that rural teacher's lack competency in incorporating ICT in teaching and learning.

Conclusion

This research highlights level of test construction competency and test construction knowledge required improvement among the senior secondary schools teachers of mathematics in Gombe State in which findings has extend the collaboration among the teachers as well as administrators. However, training and retraining is vital among teachers which administrator are responsible to be established in and during service as research result testify that Lack of test construction competency and test construction knowledge

required improvement among the senior secondary schools teachers of mathematics in Gombe State which pose challenges.

Without given true right to use to test construction competency and test construction knowledge that requires improvement among the senior secondary schools teachers of mathematics in Gombe State might not be advantage to the learners because finding emphasized that schools in rural and urban are different in term of test construction but test construction knowledge need more improvement. Hence, administrators are to help teachers through supervision in order for male and female gain more on test construction competency and test construction knowledge that requires improvement among the senior secondary schools teachers of mathematics in Gombe State.

Recommendations

Findings from this study have shown a way forward and conclusions have shown that more need to be done concerning test construction competency and test construction knowledge in secondary schools, the study makes the following recommendations:

1. The Ministry of Education should organize regular training, workshops, and seminars to improve test construction competency and test construction knowledge in Secondary School students.
2. To improve teaching learning both teachers should be on test construction competency and test construction knowledge platforms for collaboration outside the state.
3. School management are advised to assist teachers on request through digital tools use from government in order to curtail the lack and low levels



of test construction competency and test construction knowledge pose challenge

4. Adequate resources should be provided to principals to increase control on test construction competency and test construction knowledge.

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