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Influence of Teacher-Related Variables on Competence in Multiple-Choice Test Construction

[*1]Ugada, C., & [2]Ocheni, C.A.
[1]Department of Educational Foundations, Rivers State University, Nkpolu–Oroworukwo, Port Harcourt, Nigeria
[2]Department of Education, University of Nigeria, Nsukka

[*]**Corresponding author email:** catherine.ugada@ust.edu.ng

Abstract
The study sought to determine the influence of teacher-related variables on their competencies in multiple-choice test (MCT) construction. A descriptive research design was adopted. The research was conducted in Rivers State, Nigeria. The research population comprised 7142 senior secondary school teachers during the 2021/2022 academic session. A sample size of 400 teachers was drawn for the study. Multi-stage sampling technique was used in the study. The instrument "Teachers` Competencies in Multiple Choice Test Construction (TCMCTC)" was employed to collect data. Three experts in Measurement and Evaluation validated the instrument. Cronbach alpha formula was used to estimate the internal consistency reliability index of .79 for the instrument. Five research questions and five hypotheses informed the study. Mean and standard deviations addressed the research questions while independent t-test and one-way ANOVA tested the hypotheses at 0.05 level of significance. The results showed that teachers` gender, years of teaching experience, qualification, school type and school location all independently and significantly influenced their competencies in the construction of MCT. Based on these findings, recommendations are made that in-service trainings, workshops, seminars and conferences be arranged to help private and public school teachers as well as urban and rural schools among others improve in their competencies of MCT construction.

Keywords: Teachers` Competencies, Multiple-Choice Test Construction (MCT), Gender, Experience, Qualification

Introduction

Test as an assessment tool is essentially used in the field of education for the purpose of measuring or quantifying learners academic progress or otherwise. It provides information and necessary feedbacks on the extent of effectiveness of instructional processes. Iketaku (2013) defined a test as a set of questions administered to an individual which is expected to produce a measure that is a representative of the numerical attributes of such an individual. In a similar way, Orluwene (2012), sees test as an instrument used to determine the relative presence or absence of the trait measured for. In essence, a test is an assessment tool that is used to quantify the academic standing or position of a learner. Test offers a number of benefits in the field of education. Test serves such educational purposes as selection, placement, classification, certification, promotion, feedbacks, among others. To Obilor and Ugada (2023), test is seen as instrument used to collect sample of behaviour which indicate that learners have the given instructional objectives. These underscores the importance of a test. According to Nworgu (2015), several forms of test exist, including multiple-choice test, essay test, completion type test, and so on. One of the most prominent among these forms of test is the multiple-choice test (Davidson, 2011).

The multiple-choice test (MCT) form is structured in such a way that there are various components or aspects. These components are the stem (a structured statement conveying the problem), and alternatives or options (a list of suggested responses or solutions). The alternatives comprise the correct response called the "key" and a set of incorrect responses which are regarded as distractors. To this end, Obilor (2019) states that multiple choice test determine the readiness of a student in answering a specific question, since all the possible answers are given and the test is given in order to assess the complex concepts as well as the simple understanding of the students. As one of the most predominant of all test forms, the multiple-choice test (MCT) offers enormous importance to the

field of educational assessment. It is flexible, reliable, measurable and can easily be responded to by students (Greenan, 2017). It has also been identified to measure a wider range of content and higher-level of thinking skills (Weimer, 2018). More so, it facilitates retention, and allows for efficient measurement of both basic knowledge and complex concepts and can equally assess many topics as it can be answered quickly within a short timeframe.

The foregoing are indications of the effectiveness and efficiency of the MCT. Ubulom, et al (2019) outline two types of multiple choice test items; "the correct answer type" and "the best answer type." In the correct answer type, there is an absolutely correct answer. On the other hand, the best answer type presents options that represent answers of varying degrees of acceptability. The respondent is expected to select as the answer, one option that is clearly better than the others. To this effect, they suggested guidelines among others while structuring multiple choice test items; the correct answer should randomly take the various positions of the no pattern of positions as adopted to encourage guessing. Thus, efforts must be geared towards ensuring that the multiple-choice test is duly and properly constructed so as to ensure its reliability and validity in the measurement of learning outcomes. This is necessary since the quality of any assessment tool or instrument is largely dependent on its development processes and such qualities as reliability and validity. In the reports of researchers, in order to effectively construct a quality MCT, there are test development or construction processes that need to be followed. The knowledge of these procedures influences the level of competencies of a teacher when constructing a multiple-choice test. These include planning of a test, content analysis, development of a test blue print (TBP), item writing and validation (Osadebe, 2015). When a teacher is able to effectively apply these steps in constructing a MCT form, such a teacher could be said to have accumulated relevant skills and knowledge, hence, is competent in constructing a multiple-choice test. Basically, such a teacher must be able to determine the purpose for which the test is to be developed, outlines the subject matter or content domain needed to develop such a test, construct a test blue print or table of specification by taking note of the topic and cognitive dimensions and finally constructing questions which will be validated to ensure the appropriateness and correctness of the test (Nworgu, 2015). As the author further noted, it is however very important for teachers to have sufficient understanding that at the point of item writing, distractors should be made plausible, negative stem should be minimized, options should be as short as possible and uniformly arranged, double negative in stems or options should be avoided and clues that could give away answers should be minimized, among others. These steps outlined is required to be properly followed so as to guarantee the standard of the multiple-choice test.

Even though the quality of a multiple-choice test has been largely placed on its development processes, reports by scholars show that the level of multiple-choice test construction by teachers especially at the secondary school level is poor (Kazuko, 2010; Hamafykyelto, et al., 2015). More so, teachers possess inadequate knowledge on MCT construction (Quansah, Amoako & Ankoma, 2018). Similarly, Rivai, et al., 2019) reported that teachers at the secondary school level find it very difficult to construct quality multiple-choice test as well as establishing such indices as reliability and validity. In another report, Lawrie, et al (2018) stated that secondary school teachers have little or no knowledge of multiple test item construction. Subsequently, Lopes, et al (2010) found that the multiple-choice test form is difficult to construct and time consuming, as such, requires certain level of skills or competencies which teachers lack. Perhaps, these could be the reasons while teachers appear to be inadequate in constructing multiple choice test. The implication of the above indicates that feedbacks, decisions, judgements and policies made on students` progress as a result of measurement from such a test could be inaccurate and misleading. Perhaps, it is possible that such teacher-related variable as gender could be a factor influencing their competencies in the construction of MCT.

Gender deals with the roles or characteristics that is particular to either males or females as assigned by the society. Gender has become an influencing factor in the field of education. This includes teachers` competencies in the construction of multiple-choice test. Solheim and Lundetrae (2016), Camble and Hamman-Tukur (2017) found that gender influences teachers` competencies in the construction of MCT. However, Laube, et al (2007), Inko-Tariah and Okon (2019), Bika and Buba (2020) all found that gender does not influence teachers` competencies in constructing MCT. These reports shows that opinions of researchers are divided over the influence of gender on teachers` competencies in MCT construction. Thus, further study is required to address these differences in findings of scholars. Another teacher-related variable which could influence their level of competencies in the construction of MCT is teachers' number of years in service.

The total number of years the teachers have been in active service may be considered as the culmination of skills, exposures, or trainings that a teacher has acquired over time which enables such a teacher to effectively carryout the activities of teaching so as to facilitate students` learning (Indeed Editorial Team, 2021). In essence, the number of skills, teaching experience, in-service pedagogical trainings and development acquired by a teacher for effective teaching determines their experiences. Thus, it is possible that teachers` years of experience can influence

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their level of MCT construction. Bika and Buka (2020) reported that teachers` experience significantly influences their competencies in the construction of a test. This is similar to the findings of Camble and Hamman-Tukur (2017), Agu, Onyekuba and Anyichie (2013) that years of teaching experience influences teachers` level of test construction. On the contrary, Inko-Tirah and Okon (2019), Ahmed, Abdullahi and Bashir (2022) all reported no significant influence of years of teaching experience on their competencies in the construction of tests. Inconsistencies as above necessitated this study. More so, another factor which could influence teachers` competency in constructing MCT is their academic qualification.

Teachers` qualification has been considered as central factor in teachers` competency in teaching and assessment. It entails teachers` score on a test, extent of preparation in a subject matter, pedagogical skills and professional development (Egun, 2016). It also covers but not limited to those aspects as academic degrees or certification such as O`level, NCE, B.Sc/E.d, PGDE, M.Sc./Ed. B.A, PhD, and so on (Kola & Sunday, 2015). Judging by the fact that teachers` certification determines how professionally, pedagogically exposed and competent a teacher could be, it is possible that it could also determine their competencies in the construction of MCT. Perhaps, this is true as the report of Quansah and Amoaka (2018) showed that unqualified teachers lack the ability to plan, write and review test items. On the other hand, Camble and Hamman-Tukur (2017) stated that the qualification of a teacher is not related to their competencies in test construction. Equally, Inko-Tariah and Okon (2019) found that the qualification of a teacher does not determine competencies in constructing a test. This is an indication that disagreement exist among scholars. Thus, more investigation is required. Hence, this study is necessary in order to resolve the inconsistencies among scholars. It is important to note also that the type of school in which a teacher is could determine their competencies in multiple-choice test construction.

School type can be described on the basis of school ownership such as public or private school (Chen, 2019). Public schools which usually lacks basic facilities and competent teachers are usually administered under the jurisdiction of non-governmental organisations like religious organisations, private institutions or individuals and are usually equipped with good infrastructures and qualified teachers (Organization of Economic Cooperation and Development [OECD], 2012). The above means that school type could determine teachers` competencies in constructing a MCT since it can also influence the category of teachers employed. Nevertheless, Camble and Hamman-Tukur (2017) stated that the competency of a teacher in constructing a test is not related to the type of school such a teacher teaches. Consequently, a socializing factor such as school location may also determine how efficient a teacher is when it comes to constructing the multiple-choice test.

School location entails the geographical position of a school. Ocheni (2021) describes school location as the place in which a school is situated. According to the author, this can either be urban (endowed with social amenities such as electricity, good roads, treated water, schools and hospitals) or rural (lacking basic infrastructures as schools, roads, pipe borne water, schools etc.). As a result of the above, teachers who are highly competent and experienced prefer to live and teach in schools located in urban than rural. This could in way influence their overall competency in constructing a multiple-choice test. As such, this study also seeks to investigate the influence of school location on teachers` competencies in constructing the MCT format.

Literature is briming of the relevance of the multiple-choice test format. Studies have also shown that quite a number of teachers lacks competencies in the construction of multiple-choice test form. This has been linked to teacher-related factors such as gender, teaching experience, academic qualification, school type and school location. However, while some researchers are of the assertion that the aforementioned variables influence teachers` competencies in multiple-choice test construction, other researchers are of the contrary view. This disparity in result of scholars is an indication that findings on these teacher-related variables are inconclusive. Thus, this study seeks to address these inconsistencies by examining the influence of teacher-related variables on competencies in the construction of the multiple-choice test. The study addresses the following questions:

1. What is the difference in the mean competency ratings of male and female secondary school teachers in MCT construction?
2. What is the difference in the mean competency ratings of secondary school teachers on MCT construction based on their years of teaching experience?
3. What is the influence of teachers` qualification on their mean competency ratings in MCT construction in secondary schools?
4. What is the difference between public and private secondary school teachers in their mean ratings on competencies in MCT construction?
5. What is the influence of school location on the mean ratings of secondary school teachers` competencies in the construction of MCT?

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Hypotheses

At 0.05 level of significance, the following null hypotheses were tested.

$H0_1$: There is no significant difference in the mean competency ratings of male and female secondary school teachers in MCT construction.

$H0_2$: There is no significant difference in the mean competency ratings of secondary school teachers on MCT construction based on their years of teaching experience

$H0_3$: There is no significant influence of teachers` qualification on their mean competency ratings in MCT construction in secondary schools

$H0_4$: There is no significant difference between public and private secondary school teachers in their mean ratings on competencies in MCT construction

$H0_5$: The mean rating of secondary school teachers on their competencies in MCT does not differ significantly based on school location.

Materials and Methods

This study employed the procedures of a descriptive research design. This is because, the variables of the study (gender, qualification, experience, location and school types) which are under investigation can not be manipulated by the researcher as they have already been assigned by nature. The research was undertaken in Rivers State, Nigeria. The study population comprised of 7142 senior secondary school teachers for 2021/2022 academic year in the area. This comprised 3681 male and 3461 female teachers. The Taro Yamen (1976) formula was used to estimate the minimum sample size required. This informed the sampling of 400 secondary school teachers 200 males and 200 females). The study employed multi-stage sampling method using simple random sampling (balloting with replacement), purposive and disproportionate stratified random sampling techniques were used in the sampling process. The instrument titled: Teachers` Competencies in Multiple Choice Test Construction (TCMCTC) which has Section A and B was used for data collection. Section A identified teachers characteristics like years of teaching experience, sex, years of teaching experience, academic qualification, school type and location. Section B contained 30 items on teachers` competencies in constructing multiple-choice test. The TCMCTC was adapted from Agu et al (2013). The items of the instruments were modified to suit the purpose of this study. Three experts of Research, Measurement and Evaluation face validated the instrument. Cronbach alpha method was used to estimated the internal consistency reliability index. This yielded an index of 0.79 Direct Delivery Technique (DDT) was employed in the study's data collection process to ensure 100% return rate. Mean and standard deviation were used to address the research questions while t-test and ANOVA tested the formulated hypotheses at an a-prior level of 0.05. The results are presented using tables below.

Results

Table 1: Mean and standard deviation of mean ratings of male and female teachers on MCT construction

Gender	N	$\bar{X}$	SD	df	t-value	Sig.(2-tailed)	Decision
Male	200	2.66	.42	398	3.816	.000	Sig.
Female	200	2.52	.34				

The result in Table 1 shows the mean and standard deviation of the ratings of male and female teachers on MCT construction. From the result, the male teachers have a mean rating of 2.66 and a standard deviation of 0.42 while the female teachers have a mean rating of 2.52 and standard deviation of 0.34. This result shows that the male teachers have more competencies in constructing the MCT more than their female counterparts. The standard deviation of 0.42 and 0.34 shows a low level of variations in the ratings of both female and male teachers. Table 1 further shows that the t-value (df=398) =3.816, $p<0.05$ was obtained. This indicates that the exact probability value of 0.000 obtained is less than 0.05 level of significance. Therefore, the null hypothesis is rejected. Inference drawn is that there is a significant difference between male and female teachers in their competencies in the construction of MCT in favour of the male teachers.

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Table 2: Mean and standard deviation of mean ratings of teachers on MCT construction based on years of teaching experience

Experience	N	$\bar{X}$	SD
0-5 years	109	2.41	.32
6-10 years	127	2.67	.35
11-15 years	108	2.65	.40
16 years & above	56	2.66	.47

The analysis of the result in Table 2 explain the mean and standard deviation of the influence of years of teaching experience on the competency in MCT construction of teachers. The result revealed that the mean competency rating on MCT construction of teachers` with 0-5 years of teaching experience is (n=109, $\bar{X}$= 2.41, SD= 0.32) and (n=127, $\bar{X}$= 2.67, SD= 0.35) for 6-10 years of teaching experience, (n=108, $\bar{X}$= 2.65, SD= 0.40) for 11-15 years of teaching experience and (n=56, $\bar{X}$= 2.66, SD= 0.47) for 16 years and above of teaching experience. From the result, the mean competencies rating of teachers with 6-10 years of teaching experience was higher, followed by 16 years and above, 11-15 years and lastly, 0-5 years. This means that the more experienced teachers are more competent in constructing the MCT than the less experienced teachers. The standard deviations across the various levels of experience shows that there is only a slight variation in the ratings of the teachers

Table 3: Analysis of variance (ANOVA) of the significant difference in the mean ratings of teachers on MCT construction based on years of teaching experience

Source	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.106	3	1.702	12.168	.000
Within Groups	55.395	396	.140		
Total	60.502	399			

Analysis in Table 3 shows the ANOVA result of the significant difference in the mean ratings of teachers on MCT construction based on years of teaching experience. The result shows that F-ratio (3, 396) =12.168, $p<0.05$ was obtained. This is an indication that the p-value of 0.000 is less than 0.05 level of significance. Thus, the null hypothesis is rejected. Conclusion drawn is that, there is a significant difference in the mean competency ratings of secondary school teachers on MCT construction based on their years of teaching experience. In order to reveal where the difference lies, a Scheffe post-hoc test is conducted below.

Table 4: Scheffe post hoc test of the difference in teachers` mean ratings on MCT based on experience

		Mean Difference (I-J)			95% Confidence Interval	
(I) Experience	(J) Experience		Std. Error	Sig.	Lower Bound	Upper Bound
0-5 years	6-10 years	-.26350*	.04883	.000	-.4006	-.1264
	11-15 years	-.24321*	.05078	.000	-.3858	-.1006
	16 years & above	-.24874*	.06149	.001	-.4214	-.0761
6-10 years	0-5 years	.26350*	.04883	.000	.1264	.4006
	11-15 years	.02029	.04896	.982	-.1172	.1577
	16 years & above	.01476	.06000	.996	-.1537	.1832
11-15 years	0-5 years	.24321*	.05078	.000	.1006	.3858
	6-10 years	-.02029	.04896	.982	-.1577	.1172
	16 years & above	-.00553	.06159	1.000	-.1784	.1674
16 years & above	0-5 years	.24874*	.06149	.001	.0761	.4214
	6-10 years	-.01476	.06000	.996	-.1832	.1537
	11-15 years	.00553	.06159	1.000	-.1674	.1784

*. The mean difference is significant at the 0.05 level.

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In Table 4, the Scheffe post-hoc test shows that teachers with 16 years of classroom experience and above are significantly more competent in MCT construction than those with 0-5 years of experience. More so, teachers with 6-10 years of experience as well as those with 11-15 years of experience are significantly more competent in the construction of MCT than those with 0-5 years of experience. However, the difference in the mean competencies of teacher in MCT construction among teachers with 6-10 years, 11-15 years and 16 years above are not significant.

Table 5: Mean and standard deviation on ratings of teachers on MCT construction based on qualification

Qualifications	N	$\bar{X}$	SD
PhD	28	2.95	.47
M.Sc/Ed/PGDE	36	2.75	.46
B.Sc/Ed/B.A/Engr	114	2.61	.39
HND/OND	116	2.54	.34
NCE	87	2.53	.31
O`level	19	2.29	.23

Table 5 shows the mean and standard deviation on competencies of teachers in MCT construction based on academic qualification. The result shows the mean values on competencies on MCT construction of teachers as 2.95, 2.75, 2.61, 2.54, 2.53 and 2.29 with standard deviations of 0.47, 0.46, 0.39, 0.34, 0.31 and 0.23 for PhD, M.Sc./M.Ed./ PGDE, B.Sc./B.Ed./B.A/B.Engr., HND/OND, NCE and O`level qualifications respectively. This result indicates that teachers with PhD qualifications are more competent in constructing the MCT followed by those with M.Sc./M.Ed./PGDE, B.Sc./B.Ed./B.A/B.Engr., HND/OND, NCE and finally, O`level qualifications. The standard deviations also showed that there exists low level of variations in the ratings of teachers` competencies at the various levels of qualifications.

Table 6: Analysis of variance (ANOVA) of the significant difference in the mean ratings of teachers on MCT construction based on qualifications

Source	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6.882	3	1.376	10.114	.000
Within Groups	53.620	396	.136		
Total	60.502	399			

Table 3 shows the ANOVA of the significant difference in the mean ratings of teachers on MCT construction based on their academic qualifications. The result shows that an F-ratio (3, 396) =10.114, $p<0.05$ was obtained. Since the p -value of 0.000 is less than 0.05 level of significance, the null hypothesis is rejected. Based on this, inference drawn is that there is a significant influence of teachers` qualification on their mean competency ratings in MCT construction in secondary schools. A Scheffe post-hoc test is conducted below to show the difference.

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Table 7: Scheffe post hoc test of the difference in teachers` mean ratings on MCT based on qualifications

		Mean Difference (I-J)			95% Confidence Interval	
(I) Qualification	(J) Qualification		Std. Error	Sig.	Lower Bound	Upper Bound
PhD	M.Sc/Ed/PGDE	.19250	.09296	.510	-.1184	.5034
	B.Sc/Ed/B.A/Engr	.33851*	.07781	.002	.0783	.5987
	HND/OND	.40802*	.07768	.000	.1482	.6678
	NCE	.41661*	.08015	.000	.1485	.6847
	O`level	.65553*	.10965	.000	.2888	1.0222
M.Sc/Ed/PGDE	PhD	-.19250	.09296	.510	-.5034	.1184
	B.Sc/Ed/B.A/Engr	.14601	.07053	.510	-.0899	.3819
	HND/OND	.21552	.07038	.098	-.0199	.4509
	NCE	.22411	.07311	.097	-.0204	.4686
	O`level	.46303*	.10461	.002	.1132	.8129
B.Sc/Ed/B.A/Engr	PhD	-.33851*	.07781	.002	-.5987	-.0783
	M.Sc/Ed/PGDE	-.14601	.07053	.510	-.3819	.0899
	HND/OND	.06951	.04865	.843	-.0932	.2322
	NCE	.07810	.05252	.819	-.0975	.2537
	O`level	.31702*	.09141	.036	.0113	.6227
HND/OND	PhD	-.40802*	.07768	.000	-.6678	-.1482
	M.Sc/Ed/PGDE	-.21552	.07038	.098	-.4509	.0199
	B.Sc/Ed/B.A/Engr	-.06951	.04865	.843	-.2322	.0932
	NCE	.00859	.05232	1.000	-.1664	.1836
	O`level	.24751	.09130	.199	-.0578	.5528
NCE	PhD	-.41661*	.08015	.000	-.6847	-.1485
	M.Sc/Ed/PGDE	-.22411	.07311	.097	-.4686	.0204
	B.Sc/Ed/B.A/Engr	-.07810	.05252	.819	-.2537	.0975
	HND/OND	-.00859	.05232	1.000	-.1836	.1664
	O`level	.23892	.09342	.260	-.0735	.5513
O`level	PhD	-.65553*	.10965	.000	-1.0222	-.2888
	M.Sc/Ed/PGDE	-.46303*	.10461	.002	-.8129	-.1132
	B.Sc/Ed/B.A/Engr	-.31702*	.09141	.036	-.6227	-.0113
	HND/OND	-.24751	.09130	.199	-.5528	.0578
	NCE	-.23892	.09342	.260	-.5513	.0735

* The mean difference is significant at the 0.05 level.

Table 7 shows the Scheffe post hoc on the difference among the qualifications of teachers based on their competencies in constructing MCT. The result shows that the competencies of teachers with PhD qualifications is significantly different from that of those with B.Sc./B.Ed./B.A./B.Engr., HND/OND, NCE and O`level qualifications. However, the difference between teachers with PhD and those with M.Sc./M.Ed./PGDE is not significant. Consequently, the competencies in MCT construction of teachers with M.Sc./M.Ed./PGDE is significantly different from that of those with O`level qualification but not different from those with B.Sc./B.Ed./B.A./B.Engr., HND/OND and NCE qualifications. Furthermore, the competencies in the construction of MCT of teachers with B.Sc./B.Ed./B.A./B.Engr., is significantly higher than that of those with O`level qualification but not different from that of those with HND/OND, NCE. Finally, the competencies in MCT construction of teachers with HND/OND, NCE and O`level qualifications are not significantly different.

Table 8: Mean and standard deviation of mean ratings of private and public schools` teachers` competencies in MCT construction

School Type	N	$\bar{X}$	SD	df	t-value	Sig. (2-tailed)	Decision
Private	215	2.68	.41	398	4.975	.000	Sig.
Public	185	2.49	.33				

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Table 8 shows the mean and standard deviation of the mean ratings of teachers in private and public schools based on their competencies in constructing MCT. The result shows that the teachers in public schools (n=125) have a mean competency rating of 2.68 with an SD of 0.41 while those in public schools (n=185) have a mean competency rating of 2.49 with SD of 0.33. This means that the mean competencies on MCT construction of teachers in private school is higher than of their counterpart in public schools. The SD of 0.41 and 0.33 reflects a low level of variation in the competency ratings of the teachers on MCT construction. Furthermore, Table 8 shows that on the basis of the significant difference between teachers in private and public schools, based on their competencies in MCT construction, the t-value of 4.975 at 398 degrees of freedom with an associated exact probability value of 0.000 was obtained. Since the p-value of 0.000 is less than 0.05 level of significance, the null hypothesis is rejected. Therefore, the decision is that a significant difference exists between teachers in public and private secondary school teachers, in their mean ratings on competencies in MCT construction.

Table 9: Mean and standard deviation of mean ratings of rural and urban school teachers` competencies in MCT construction

Location	N	$\bar{X}$	SD	df	t-value	Sig. (2-tailed)	Decision
Urban	204	2.68	.41	398	4.941	.000	Sig.
Rural	196	2.50	.34				

The result in Table 9 shows the mean and standard deviation of rural and urban school teachers as regards the competencies in MCT construction. The result shows that urban school teachers have a mean competency rating of (n=204, $\bar{X}$= 2.68, SD= 0.41) on MCT construction while the rural school teachers have a mean competency rating of (n=196, $\bar{X}$= 2.50, SD= 0.34) on MCT construction. This result implies that the urban school teachers are more competent in constructing the multiple-choice test more than the rural school teachers. The standard deviations shows that there is only a slight variation in the ratings of both rural and urban school teachers with regards to their competencies in MCT construction. Consequently, on the basis of the significant difference in the mean competency ratings of urban and rural school teachers in MCT construction, the t-value (df=398) =4.941, $p<0.05$ was obtained. Because the probability value of 0.000 obtained is less than 0.05 level of significance set for decision, the null hypothesis was rejected. Inference drawn is that, there is a significant influence of school location on the mean ratings on the competency of secondary school teachers in the construction of MCT.

Discussion

The findings of the study shows that male teachers are more competent in constructing the multiple-choice test more than the female teachers. This means that gender influences teachers` competencies on MCT construction. Further analysis revealed that the influence of gender was significant. In essence, the difference in the mean competencies on multiple-choice test constructions of teachers is significantly different based on gender skewed in support of the male teachers. This outcome may be attributed to the male teachers being be more grounded and exposed to test development processes as a result of some of its statistical aspects more than the female teachers. This mathematical inclination of the males over the females could have informed the result. The outcome of the study is corroborated by Solheim and Lundetrae (2016) as well as Camble and Hamman-Tukur (2017) that reported that gender influences teachers` competencies in test construction. Disagreeing with these reports, Laube et al (2007), Inko-Tariah and Okon (2019), and Bika and Buba (2020) all reported that gender does not influence teachers` competencies in test construction. These differences might have arisen due to the geographical settling of the research.

The study also revealed that teachers` years of teaching experience influences their competencies in MCT construction. From the result, teachers with higher teaching experience showed higher level of competencies in MCT construction when compared to those with lesser years of teaching experience. Further analysis showed that the difference was significant. A post-hoc test affirmed the significant difference as teachers with a cumulative period of 6 years and above were significantly more competent in constructing MCT when compared to those with 0-5 years of experience. This result is not surprising since the teachers with a greater number of years in teaching would have through experiences, acquired more knowledge and competencies in planning and preparing MCT. This could have made the result of this study the way it is. These results align with the study of Agu et al (2013), Camble and Hamman-Tukur (2017), and Bika and Buka (2020) that the length of teaching service is a factor that significantly influence in test construction. On the contrary, Inko-Tariah and Okon (2020) as well as Ahmed et al (2022) found in their respective studies that years of teaching experience does not influence teachers`

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competencies in MCT construction. The disparity in outcomes may be as a result of such factors as teachers` profession or academic qualification, among others.

Furthermore, the research demonstrated that teachers who possess PhD qualifications are more competent in constructing the MCT, followed by M.SC/Ed/PGDE, B.Sc./B.Ed./B.A/B.Engr, HND/OND, NCE and finally O`level. The ANOVA result conducted further showed that the difference in teachers` competencies based on academic qualification is significant. In essence, teachers who are more qualified academically are more competent in constructing the MCT more that those with lower qualifications. This result is very possible since the more qualified teachers could have been exposed to more pedagogies and test constructions skills when compared to those with lower qualifications. This study is corroborated by Quansah and Amoaka (2018). However, it disagreed with the report of Camble and Hamman-Tukur- (2017) as well as Inko-Tariah and Okon (2019) that qualifications does not influence teachers` competencies in the construction of MCT. This differences in the findings of the study may be due to other factors not covered in this work such as teacher`s self-efficacy, and so on

Similarly, the study showed that private school teachers are more competent in constructing the MCT when compared to those in public schools. The corresponding hypothesis test indicated that private school teachers are significantly more competent in constructing the MCT when compared to their counterparts in public schools. This result means that teachers in private schools adopts the test development processes more accurately than those in public schools. This result is plausible because, it has been found from literature that teachers of private schools are more qualified than those of public schools, this could have influenced their competencies in constructing the MCT. This result however disagreed with the report of Camble and Hamman-Tukur (2017) that school type does not influence teachers` competencies in test construction. Perhaps, the difference in location and the categories of teachers investigated may have influenced the outcome of the research.

Furthermore, the findings indicated that teachers in urban location are more competent in constructing the multiple-choice test when compared to those in rural location. Further analysis involving the t-test showed that the difference in teachers` competency in constructing MCT based on location is significant. This means that urban school teachers construct the MCT more competently when compared to those in rural schools. This result is possible since qualified and competent teachers tend to prefer the urban location more than the rural location. Thus, teachers investigated in urban location could have been more qualified and hence, competent in constructing the MCT more than those in rural location. This finding will help researchers to be aware that location influences competencies in MCT construction.

Conclusion

In accordance with the outcome of the study, it is concluded that gender significantly influences teachers` competencies in constructing the MCT. Equally, teachers` years of teaching experience also determines their competencies in constructing the MCT. In a similar way, teachers with higher academic qualifications are more competent in MCT construction compared to the less qualified ones. Furthermore, teachers in private school possess higher level of competencies in constructing MCT when compared to those in public schools. Finally, the study concludes that urban school teachers construct the MCT more competently than their rural counterparts.

Recommendation

From the conclusions drawn from this study, these recommendations are made.

1. Efforts should be made by stakeholders through training to ensure that teachers are exposed to the processes involved in developing the MCT with emphasis on females` teachers` participation so as to neutralize bias due to gender

2. School authorities should endeavour to train and retrain teachers who have not only been teaching for a few years and those with lower qualifications in the development of MCT.

3. Workshops, conferences and seminars should be organized by the government and concerned authorities for teachers in both rural and urban as well as private and public schools on the processes of MCT development, this could help improve their competencies.

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