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Teachers' Awareness and Usage of Standard Scores in Assessment of Students' Mathematics Performance in Secondary Schools in Rivers State

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Abstract

The paper investigated on teachers' awareness and utilization of standard scores in assessment of students' mathematics performance in secondary schools in Rivers State. Two research questions and two hypotheses guided the study. The design of the study is descriptive design. A sample of fifty-four (54) mathematics teachers was drawn from the population of 12,342 teachers in the locale of the study through multistage sampling procedures. An instrument titled Standard Score Awareness and Utilization Questionnaire (SSAUQ) developed by the researchers was used for data collection. Factor analysis was used to determine the validity of SSAUQ while Cronbach alpha was used to establish a reliability index of 0.89 indicating that the instrument was reliable. Mean and standard deviation were used to answer the research questions while two-way analysis of variance was used to test the hypotheses at 0.05 alpha level. The results revealed that there is no significant interaction difference in the level of awareness of standard scores in mathematics assessment by teachers based on their location, school type as well as gender. Also, there is no significant interaction difference in the level of utilization of standard scores in mathematics assessment by teachers based on their location, school type as well as gender. Based on the findings, it was recommended among others that Government should from time to time organize conferences, workshops and seminars for teachers concerning use of standard scores in assessing students' performance.

Keywords: Awareness, utilization, standard scores, mathematics.

INTRODUCTION

Achievement or learning outcomes and performance in schools are ascertained through assessment. Assessment is the full range of procedures used to gain information about a student learning which include observation, ratings of performance or projects, paper-and-pencil tests and the formation of value judgements concerning learning progress. In this case, assessment includes both quantitative descriptions and qualitative descriptions of students. Opara (2018) sees an assessment as an interactive process between teachers and students and it informs teachers on how well their students are learning what they are teaching. According to Bokolo and Uwah (2019), it is obvious that assessment or examination is an important phenomenon in the process of students' evaluation. There is also an actual gain to state that without assessment, students' abities, competencies and effort cannot be determined let alone classified. Rasul & Bukhsh (2011) also stated that examinations are useful as it measures a student's progress towards predetermined objectives. Assessment involves a process for testing the abilities or achievement of the students in any area of academic program. Assessment in education refers to the wide variety of methods or tools that educators use to evaluate, measure, and document the academic readiness, learning progress, skill acquisition, or educational needs of students.

Allen (2004), stated that assessment also involves the systematic process of documenting and using empirical data on the knowledge, skill, attitudes, and beliefs to refine programs and improve students learning. Kuh, Jankowski and Ikenberry (2014) opined that assessment data can be obtained from directly examining students work to assess the achievement of learning outcomes or can be based on data from which one can make inferences about learning. Assessment is often used interchangeably with test, but not limited to tests. Nelson and Dawson (2014) further commented that assessment can focus on the individual learner, the learning community (class, workshop, or other organized group of learners), a course, an academic

program, the institution, or the educational system as a whole (also known as granularity). According to Suskie (2004), assessments are often equated with traditional tests especially the standardized tests developed by testing companies and administered to large populations of students. It is also noted that educators use a diverse array of assessment tools and methods to measure everything. Just as academic lessons have different functions, assessments are typically designed to measure specific elements of learning e.g., the level of knowledge a student already has about the concept or skill the teacher is planning to teach or the ability to comprehend and analyze different types of texts and readings. Assessments also are used to identify individual student weaknesses and strengths so that educators can provide specialized academic support**,** educational programming, or social services. In addition, assessments are developed by a wide array of groups and individuals, including teachers, district administrators, universities, private companies, state departments of education, and groups that include a combination of these individuals and institutions

Black, Paul, & William, & Dylan (1998) noted that assessment comes in various forms including placement, formative, summative and diagnostic assessment; objective and subjective assessment, referencing (criterion-referenced, norm-referenced, and ipsative (forced-choice); informal and formal assessment and finally internal and external assessment.

According to Bokolo and Uwah (2019), mathematics is the science of structure, order, and relation that has evolved from elemental practices of counting, measuring, and describing the shapes of objects. It has also been established that mathematics problems has been a concern to humans as far back as the early centuries with great philosophers trying to find solutions to them. Like any other discipline, testing remains the only vital tool through which one can assess individual performance in mathematics.

Mathematics as a core subject in the curriculum over the years has been a problem for most students. Opara and Uwah (2017) pointed that a 2016 report by the Joint Admission and Matriculation Board (JAMB) states that only 18% of candidates registering for the UTME examinations make a pass mark in mathematics on their first sitting. This remark however is very alarming and calls for rapid attention if Nigeria as a country is to compete with the Western world. It is also evidenced that students' performance in mathematics can be measured using tests or examinations. On this note, Kpolovie (2012) noted that not until a test is able to reflect the true attribute, characteristics and abilities of a student, then such a test is invalid. Unfortunately, with all the benefit of testing by revealing students capabilities many students have independently branded themselves as not science oriented and incapable of undertaking mathematical related courses.

Generally, assessment scores most times are reported in raw form. The result of an assessment, whether by assignment, essay, test, examination, or some other means, which is designed to ascertain a learner's current level of knowledge, ability, or achievement are at times not expressed in a standard form. The outcome might be expressed in terms of a simple pass or fail; or it might be graded using categories such as pass, credit, distinction. Alternatively, the outcome might be expressed numerically, in the form of a percentage mark. In all these, evaluators especially classroom teachers may often arrive at these using the raw scores without necessarily extending their calculations to the standard score. According to Logsdon (2020) there are various types of standardized test scores and they include; standard scores, percentiles, Z-scores, T-scores and stanine scores. He further states that Test developers calculate the statistical average based on the performance of students tested in the norming process of test development. That score is assigned a value. Different performance levels are calculated based on the differences in students' scores from the statistical average and are expressed as standard deviations. These standard deviations are used to determine what scores falls within the above average, average, and below-average ranges. Standard scores and standard deviation are different for different tests. Many of the commonly used tests, such as the Wechsler Intelligence Scales, have an average score of 100 and a standard deviation of 15. Opara (2016) opined that standard scores indicate the relative standing of an individual within a group. That is how his or her raw score compares to the mean raw score of the norming group. When the raw score is converted to a standard score, it enables teachers to express and interprete the score in relation to other scores and judge its highness or lowness. A standard score tells us in standard deviation where a testee's score is with respect to the mean of the distribution. Examples of standard scores are Z- score, T-score and stanine scores.

Z-score is the simplest standard score on which other standard scores are based. It indicates the positive and negative differences between an individual's score and the mean as measured in standard deviation units. A Z-score has a mean of zero (0) and standard deviation of one (1); while T-score is a standard score using a fixed mean and standard deviation in units that eliminates the need for decimals and negative signs. A T-score has a mean of 50 and standard deviation of 10. Scores above 50 are above average while scores below 50 are below average.

Stanine scores are normalized standard scores which use a nine-point scale. They are single-digit scores ranging from 1 to 9.They are used when

students' scores are normally distributed. A stanine score has a mean of 5 and standard deviation of 2.

Percentiles scores show how a student's performance compares to others tested during test development. A student who scores at the 50th percentile performed at least as well as 50 percent of students of his age in the development of the test. Opara (2016), defined percentile rank as the percentage of the total number of testees who have scored marks below a particular score on the test or examination It is also the percentage of scores in a distribution that fall below a given score point.

A standard score is the number of standard deviations by which the value of a raw score is above or below the mean value of what is being observed or measured. They include set of scores that have the same mean and standard deviation so they can be compared. Raw scores above the mean have positive standard scores, while those below the mean have negative standard scores. Standard score are classified as dimensionless quantity which are derived by subtracting the population mean from an individual raw score and then dividing the difference by the population standard deviation. According to Kowakzyk (2019), standard scores are an easy way to compare scores, making it possible to compare unusual things that are not in the same category.

The standard scores are very important as it tells one not only something about the value itself, but also where the value lies in a general distribution of scores. Siegle (2019) argued that without standardized scores, it is difficult to make comparisons. A raw score of 30 on one test and a raw score of 125 on another test don't have much meaning until we know where each score is in relations to the mean. In order for the score to be meaningful, we need to know whether the score is above or below the mean and how far above or below the mean. Unfortunately, knowing that the first score is 2 points above the mean and the second score is 10 points above the mean still doesn't help. Further argument is that each test is different, so being 2 points above the mean may be better than being 10 points above the mean on another test. It is only when we know how many standard deviations each score is above or below the mean that we can compare the two performances. Standard scores allow us to make comparisons of raw scores that come from very different sources.

Siegle (2019) also noted that lay people are sometimes uncomfortable with Z-scores for a couple of reasons. These "lay" people include non-statisticians, classroom teachers as well as parents. It is noted that people hardly like negative numbers and anyone who has a raw score less than the mean has a negative z-score. Second, they are uncomfortable with a Z-score of 0 being average. For instance, some parents may find it difficult to understand that her child did average on an achievement test and has a Z-score of 0. Hence, statisticians often maintain that Z-scores should be converted to a scale where negative values are not possible. These avenues include IQ scores, SAT scores, T scores etc.

According to Memory, Promise, Richard, Charles, Memory &.Gbanaiweri (2017), the use of raw scores and percent-correct scores to assess student's performance is something common among educationists, health workers and examiners of various fields. Parents compare their wards results with others based on raw score interpretation. Government and non-governmental organization likewise make comparison based on raw interpretation and most at times grant prizes for best performance in a particular course or all round performance. Meanwhile, Ukwuije (2003) have argued that raw scores cannot provide answers to some question such as which student had the best over raw performances, or which test did the different students do best? Hence, they have little or no meaning. This is so because the raw scores for each subject have different meaning and standard deviation. On the other hand, Tan and Michael cited in Memory, Promise, Richard, Charles, Memory &.Gbanaiweri (2017) submitted that it is hard to use the percent correct score which most classroom teachers use in achieving a fair comparisons of test takers performance in different forms of the same test. An example was given by the authors that getting 50% current in a hard form of test may mean the test taker has more knowledge and skill than another test taker getting 65% current on a relatively easier form of test. They pointed out that for this same reason, the raw scores cannot be used to compare test takers performance on different forms. When two test taker get the same raw scores on two different forms, the test taker who took the more difficult forms has demonstrated a higher level of performance than the test taker who took the relatively easier form, this, in most times, is over looked and student who anything whatever not to be considered as near all best is given reward as such. In essence, before comparison should be done scores on different forms of test should indicate the same level of performance no matter which form the test taker received. In the report of Flanayam and Cattabiano (2004) when students take either an individual or group-administered test at school, the results are made available to both parents and teachers. Therefore, it is better for teachers to understand the meaning of scores that comes from tests or examination. They said most educational tests are based on a scale that has a statistical mean of 100. If a student earns a standard score that is less than 100, then that student is said to have perform below average.

Hornby (2004) defined awareness as the concern about and well-informed interest in a particular situation or development. It has to do with the state of being conscious of something. More specifically, is the

ability to directly know and perceive, to feel, or to be cognizant of events. Furthermore, Hornby (2004) also defined usage as the way that something is being used, or to the proper way to make use of something such as a word or phrase or tool. It involves the ability of people to utilize the basic tool or skills at their disposal for a positive outcome.

Unfortunately, in secondary schools in Rivers state, the level of awareness of standard scores and its operation is questionable. It is observed that majority of the teachers lack the awareness of standard scores. While majority of teachers in the area are good tutors, unfortunately majority of them are less skilled in the art of assessment. On the other hand, it is also observed that while others would have kept up with the pace and technique of assessment using standard scores, they are totally unaware of this neither are they willing (if aware) to utilize them in the process of testing. Unfortunately many assessments done may not have been in line with the standard procedure of assessment and this prompted the researchers to carry out this study in order to know the level of awareness and usage of these standard scores by teachers in the area. In the light of this, the study investigated teachers' level of awareness and usage of standard scores in assessment of students' mathematics performance in secondary schools in Rivers State based on location, school type and gender. The following research questions guided the study.

1. What is the extent of awareness of standard scores in students' mathematics assessment by rural and urban, public and private as well as male and female teachers in secondary schools in Rivers state?
2. What is the extent of utilization of standard scores in students' mathematics assessment by rural and urban, public and private as well as male and female teachers in secondary schools in Rivers State?

The following hypotheses tested at 0.05 alpha level guided the study.

1. There is no significant difference in the level of awareness of standard scores in students' mathematics assessment by rural and/urban, public and private as well as male and female teachers in secondary schools in Rivers state**.**
2. There is no significant difference in the utilization of standard scores in students' mathematics assessment by rural and urban, public and private as well as male and female teachers in secondary schools in Rivers State.

METHODS

In this study, the researchers adopted descriptive research design. Fifty four (54) mathematics teachers drawn from a population of 12,342 teachers across nine LGAs in Rivers state formed sample of the study. Multistage sampling procedure was used in drawing these samples. Rivers state has a total of 23 Local Government Areas. The researchers divided the entire area into three clusters based on their senatorial districts. These comprise Rivers west, Rivers east and Rivers south-east clusters. Based on these clusters, non-proportionate sampling technique was used to draw three (3) LGAs from each giving a total of 9 LGAs. Simple random sampling by ballot was used in drawing two (2) schools from each of the LGAs giving a total of 18 schools. This latest procedure was achieved by listing names of the schools both public and private including those in rural and urban areas. Finally, the researchers used stratified non-proportionate sampling in drawing three mathematics teachers from each of the school. This gave the total of 54 teachers in all. The table below shows demographic information concerning the sample.

Table-1: Distribution of sample based on location, school type as well as gender

Geo-Zones	LGAs	Schools	Gender		
			M	F	SUM
Rivers West	Ogba/Egbema	Community Sec. School, Omoku	2	1	3
	Asari-Toru	Kings & Queens School Onelga	1	2	3
	Ahoada West	Community Sec. School, Ido	3	-	3
		Kings College of Commerce, Buguma	2	1	3
		Western Ahaoda County High School	1	2	3
		Royal Court Private School	2	1	3
Rivers East	Port Harcourt	AladumoIntnl Sec School, PH.	3	-	3
	Etche	Nigerian Navy Sec. School, PH	2	1	3
	Emuoha	Community Sec. Sch. Umuozoche	-	3	3
		Government Sec. Sch. Ndash	2	1	3
		Emmanuel College of Commerce, Emuoha	1	2	3
		Community Sec. Sch. Omudioga. Emuoha	3	-	3
Rivers South-East	Tai	Community Sec. Sch. NonwaGbam, Tai	3	-	3
	Khana	Citadel AcademyKoroma, Tai.	1	2	3
	Andoni	Zina Academy, Nyokuru-Nyokhana	2	1	3
		GSS, Khana	3	-	3
		CSS Agwut-Obolo, Andoni	1	2	3
		True Leaders Academy	3	-	3
		SUM	**35**	**19**	**54**

In order to measure the level of awareness and utilization of standard scores in assessment of students by the teachers, the researchers developed an instrument called "Standard Score Awareness and Utilization Questionnaire" (SSAUQ). The 4-point Likert format was used to develop items that measured both the level of awareness and utilization of standard scores by teachers. The instrument was designed simply with two sections. The first section carried bio-data information like gender, location of school as well as the type of school. In the second section, instructions were given on how to complete the instrument. The instrument contained 21 items in all. Factor analysis was used to determine the validity of SSAUQ while Cronbach alpha was used to establish a reliability index of 0.89 indicating that the instrument was reliable. The instrument was administered directly to the respondents with the help of a field assistant. In the process of scoring, one copy of the instrument was discarded due to triviality in the response pattern meaning that valid copies of the instrument were 53. Mean and standard deviation were used to answer the research questions while two-way analysis of variance was used to test the hypotheses at 0.05 alpha level.

RESULTS

The results are presented according to research questions and hypotheses. In order to answer research question 1and test hypothesis 1, data collected were used to determine the extent of awareness of standard scores in students' mathematics assessment by rural and urban, public and private as well as male and female secondary schools teachers in Rivers State. To achieve this, mean and standard deviation were used to answer the research question while 2-way Analysis of Variance (2-way ANOVA) was used to test the hypothesis.

Table-2: Mean standard deviation and 2-way ANOVA showing extent of awareness of Standard Scores in students' mathematics assessment by rural/urban, public/private as well as male and female teachers in secondary schools in Rivers State.

Location	School Type	Gender	N	$\bar{x}$	Std. D
Rural	Public	Male	5	18.80	6.41
		Female	2	25.50	12.02
		Total	7	20.71	7.89
	Private	Male	9	18.89	6.93
		Female	5	19.20	1.64
		Total	14	19.00	5.52
	Total	Male	14	18.86	6.50
		Female	7	21.00	5.94
		Total	**21**	**19.57**	**6.26**
Urban	Public	Male	13	16.00	5.62
		Female	8	13.50	3.02
		Total	21	15.05	4.87
	Private	Male	7	17.86	4.59
		Female	4	17.50	5.00
		Total	11	17.73	4.49
	Total	Male	20	16.65	5.24
		Female	12	14.83	4.06
		Total	**32**	**15.97**	**4.85**
Total	Public	Male	18	16.78	5.81
		Female	10	15.90	6.98
		Total	**28**	**16.46**	**6.14**
	Private	Male	16	18.44	5.86
		Female	9	18.41	3.39
		Total	**25**	**18.13**	**5.03**
	Total	Male	34	17.56	5.81
		Female	19	17.11	5.59
		Total	53	17.40	5.68

Test of Between-subject Effect (ANOVA)

Source	Type III ss.	d.f	Mean Sq	F	Sig.	Result
Location	191.399	1	191.39	6.38	0.01	Insignificant Accept Ho
School Type	0.078	1	0.078	0.003	0.96	
Gender	10.74	1	10.74	0.35	0.55	
Location/Sch.Type/ Gender	45.32	1	45.32	1.51	0.23	
Error	343.11	52				
Total	223.21	54				
Cor. Total	296.09	53				

$\propto = 0.05$

From the table, teachers in rural schools were 21 while those in the urban schools were 32. The mean and standard deviation scores for their level of awareness of standard scores by mathematics teachers in rural and urban schools were 19.57; 6.26 and 15.97;4.85 respectively. The mean indicates that teachers in the rural areas surprisingly are more aware of standard score in assessment of students in mathematics than their counterparts in the urban areas. From the test of between subject effects, sum of square and mean square was 191.397. Calculated F was 6.38 while sig. value was 0.01. Hence, since calculated sig was less that the alpha of 0.05, null hypothesis was rejected meaning that there is significant difference in the level of awareness of standard scores in mathematics assessment by teachers in rural and urban areas.

Furthermore, there were 28 teachers in public school and 25 in private schools. Their mean and standard deviation values were16.46; 6.14 and 18.53; 5.03 respectively. These mean values suggest that teachers in private schools are more aware of standard scores in the assessment of students in mathematics. Test of between subject effects also reveal sum of squares and mean squares to be 0.078. Calculated F value was 0.003 while sig value was 0.96.

Therefore, since sig (p=0.96>0.05) is higher than 0.05 alpha, the null hypothesis is retained. This means that there is actually no significant difference in the level of awareness of standard scores by teachers in mathematics assessment in private and public schools.

As seen, there were 34 male and 19 female mathematics teachers sampled altogether. Their means and standard deviation values were 17.56; 5.81 and 17.11; 5.59 respectively. This means that male teachers had more awareness of standard scores more than the female teachers. Sum of squares and mean square values were 10.74. Calculated F was 0.35 while sig value was 0.23. Hence, since sig. (p=0.23>0.05) is higher than alpha, the null hypothesis was retained. This means that there is actually no significant difference in the level of awareness of standard scores by male and female teachers in mathematics assessment in secondary schools in Rivers state.

Finally, based on their interactive effect, sum of squares and mean square were both 45.32 respectively. Calculated F was 1.51 while sig. value was 0.23. Hence, since sig (0.23>0.05) is higher than the alpha, null hypothesis was retained. This means that there is no significant interaction difference in the level of awareness of standard scores in mathematics assessment by teachers based on their location, type of school as well as gender.

In order to answer research question 2 and test hypothesis 2, data collected were used to determine the extent of utilization of standard scores in students' mathematics assessment by rural and urban, public and private as well as male and female secondary schools teachers in Rivers State. To achieve this, mean and standard deviation were used to answer the research question while 2-way Analysis of Variance (2-way ANOVA) was used to test the hypothesis.

Table-3: Mean, standard deviation and 2-way ANOVA showing extent of utilization of Standard Scores in students' mathematics assessment by rural/urban, public/private as well as male and female teachers in secondary schools in Rivers State

Location	School Type	Gender	N	$\bar{x}$	Std. D
Rural	Public	Male	5	19.81	3.31
		Female	2	23.50	11.02
		Total	7	21.31	5.12
	Private	Male	9	15.29	4.23
		Female	5	20.20	0.64
		Total	14	18.00	3.52
	Total	Male	14	16.86	7.50
		Female	7	15.10	2.94
		Total	**21**	**15.98**	**4.21**
Urban	Public	Male	13	19.12	3.42
		Female	8	18.21	2.02
		Total	21	19.11	2.77
	Private	Male	7	19.63	4.59
		Female	4	15.10	5.00
		Total	11	19.61	4.49
	Total	Male	20	18.23	5.24
		Female	12	19.23	3.00
		Total	**32**	**18.73**	**2.14**
Total	Public	Male	18	18.18	3.81
		Female	10	19.00	2.98
		Total	**28**	**18.59**	**4.14**

	Private	Male	16	15.41	5.86
		Female	9	19.32	3.39
		Total	**25**	**17.36**	**3.03**
	Total	Male	34	**19.27**	1.41
		Female	19	**13.21**	4.29
		Total	53	16.24	2.18

Test of Between-subject Effect (ANOVA)

Source	Type III ss.	d.f	Mean Sq	F	Sig.	Result
Location	122.421	1	122.42	4.18	0.02	
School Type	1.047	1	1.047	0.19	0.72	
Gender	11.41	1	11.41	0.26	0.04	Insignificant Accept Ho
Location/Sch. Type/ Gender	29.12	1	29.12	1.43	0.26	
Error	348.21	52				
Total	213.21	54				
Cor. Total	296.09	53				

From the table, the mean and standard deviation scores for their level of utilization of standard scores by mathematics teachers in rural and urban schools were 15.98; 4.21 and 18.73; 2.14 respectively. The mean indicates that teachers in the urban areas utilize standard scores in assessment more than those in the rural areas. From the test of between subjects effects, calculated F was 4.18 while sig. value was 0.02. Hence, since sig ($p=0.02<0.05$) was less that the alpha of 0.05, null hypothesis was rejected meaning that there is significant difference in the level of utilization of standard scores in mathematics assessment by teachers in rural and urban areas in favour of the urban teachers.

Furthermore, public and private schools teachers had mean and standard deviation values of 18.59; 4.14 and 17.36; 3.03 respectively. These mean values suggest that teachers in public schools utilize standard scores in the assessment of students in mathematics more than those in private schools. Test of between subjects effects also reveal calculated F value was 0.19 while sig value was 0.72. Therefore, since sig ($p=0.19>0.05$) is higher than 0.05 alpha, the null hypothesis is retained. This means that there is actually no significant difference in the level of utilization of standard scores by teachers in mathematics assessment in private and public schools in Rivers State.

Mean and standard deviation for male and female teachers were 19.27; 1.41 and 13.21; 4.29 respectively. This means that male teachers utilize standard scores more than the female teachers. Calculated F was 0.26 while sig value was 0.04. Hence, since sig. ($p=0.04<0.05$) is less than alpha, the null hypothesis was rejected. This means that there is actually a significant difference in the level of utilization of standard scores by male and female teachers in mathematics assessment in secondary schools in Rivers state.

Finally, based on their interactive effect, sum of squares and mean square were 29.12. Calculated F was 1.43 while sig. value was 0.26. Hence, since sig ($0.26>0.05$) is higher than the alpha, null hypothesis was retained. This means that there is no significant difference in the extent of utilization of standard scores in mathematics assessment by teachers based on their location, type of school as well as gender in Rivers state.

DISCUSSIONS

Based on the outcome of the study, there is a difference in the level of awareness of standard scores in mathematics assessment by teachers in rural and urban areas. Surprisingly, the result also indicated that teachers in the rural areas are more aware than those in the urban areas. This finding means that teachers that are in the rural areas are more aware of standard scores in assessment than those in the urban areas. This finding could come because teachers in the urban areas of Rivers state may have many students to assess and as such may not really be interested in being aware of any assessment process that may compound their work load. However, this finding is surprising to the researchers. This is because to the best of their knowledge, it may have been possible for teachers in urban areas to have better knowledge of standard scores than their colleagues in the rural areas. The findings of Memory, Promise, Richard, Charles, Memory &.Gbanaiweri (2017) stated that students were found to perform better in chemistry than those in citizenship education when the raw scores were converted to standard scores. This finding suggests that teachers are aware of the use of standard scores. However, the studies did not state if the schools sampled were in rural or urban areas.

From the second phase of the finding, it was noted through their mean scores that teachers in private schools are more aware of standard scores in assessment more than those in the public school. This finding could be because of the level of close monitoring teachers in private schools receives compared to those in the public schools. The reason may also be that teachers in the private school may have far less class population than those in the public

school. However, the finding further showed that there is no significant difference in the level of such awareness by teachers in private and public schools. This further means that although it is found that most teachers in private schools are more aware, such level of awareness compared to those in the public school is insignificant.

Finally, it was shown that male teachers are more aware of standard scores in mathematics assessment more than their female colleagues. This result could be due to the level of exposure male teachers are exposed to when it comes to areas in calculation. Furthermore, as observed by the researchers, majority of mathematics teachers sample are male. This could contribute to the result so stated. However, irrespective of the level of male exposure, there was no major difference that is significant enough to conclude that male teachers are more aware than the female teachers. The study of Adeyemi (2011) supported the present finding by revealing insignificant difference in the awareness level of standard score by teachers of management irrespective of gender.

Based on the level of utilization as addressed by research question two, it was found that there was a significant difference in the extent of utilization. It further showed that teachers in urban schools use standard scores more. This means that teachers that are in the urban schools may have more opportunity or capacity to use standard scores more than those in rural areas. This could be attributed to close monitoring of teachers by government agencies etc, it could also be that teachers in urban schools are more close to trainings than those in the rural areas.

It was also reported that although teachers in public schools utilizes standard scores more than those in the private schools, such utilization was not significant. This means that there is no difference in the way and manner teachers in public schools use standard scores compared to those in the private schools. It means that teachers in both public and private schools either have same level of over-utilization or under-utilization of standard scores in assessment. This finding may be because mathematics teachers in either school may not really show differences in utilizing standard scores in the assessment of students. This however is not surprising to the researcher.

It is also seen that there is a difference in the level of utilization between male and female teachers. As indicated in the first aspect of the result, though there may be indifference in the level of awareness of standard scores, the case is different in terms of uses. The findings mean that male mathematics teachers use standard scores in assessment more than female teachers. The reason for this may not be farfetched as male teachers are assumed to be more successful in mathematics related courses than females.

On the whole, there was no significant difference in the level of utilization across the location, school type as well as gender. This means that there was no difference in their interactive effect.

CONCLUSION

From the outcomes of the study, standard scores are critical and indispensable in assessment generally and especially in mathematics. This is because standard scores are more effective in comparing with raw scores that are taken from different tests especially when the data are at the interval level of measurement. However, the use of standard scores is limited due to its low level of awareness and lack of understanding by teachers. Hence, effective seminar, workshops and conferences is needed in achieving this goal.

RECOMMENDATIONS

Based on the findings, it is recommended that

1. Government should from time to time organize conferences, workshops and seminars for teachers concerning use of standard scores in assessing students.
2. Government should as a matter of fact recruit more test experts in various schools in the state as this will help in checkmating the inefficiency of test administrations by some classroom teachers.
3. Measurement and evaluation should be emphasized in teacher education programmes across the state.

REFERENCES

- Adeyemi, T.O. (2011). The Effective use of Standard Scores for Research in Educational Management. Research Journal of Mathematics and Statistics, 3(3); 91-96.
- Allen, M.J. (2004). Assessing Academic Programs in Higher Education. San Francisco: Jossey-Bass.
- Black, P., & William, D. (1998). Inside the Black Box: Raising Standards through Classroom Assessment." Phi Beta Kappan.
- Bokolo, F., & Uwah, I. V. (2019). Item Number Placement Variations and Mathematics Performance of Junior Secondary School Students InObio/Akpor Local Government Area of Rivers State Nigeria.
- Flanagan, D. P., & Caltabiano, L. F. (2004). Test scores: A guide to understanding and using test results. Helping children at home and school II: Handouts for Families and Educators. National Association of School of Psychologist.
- Hornby, A.S. (2004). Oxford advanced learner's dictionary. New York: Oxford University Press.
- Kowakzyk, I.O. (2019). Problem in utilization of standard scores in teachers' assessment. Academic Journal of Education, 4(7) 121-135.
- Kpolovie, P.J (2012). Intelligence and academic achievement: A longitudinal survey. International

Journal of Recent Scientific Research, 7(5); 11423-11439.

- Kuh, G.D., Jankowski, N., & Ikenberry, S.O. (2014). Knowing What Students Know and Can Do: The Current State of Learning Outcomes Assessment in U.S. Colleges and Universities. Urbana: University of Illinois and Indiana University, National Institute for Learning Outcomes Assessment.
- Logsdon , C. (2020). https://www.verywellfamily.com/ann-logsdon-2161669.
- Memory, Q., Promise, A. A, Richard, O., Charles O. E, Memory, D. &.Gbanaiweri, S. W. (2017). Application of Standard Scores in Assessing Course Performance of Student in College Probation Examination. International Journal of Education and Evaluation, 3(7) 83-90.
- Nelson, R., & Dawson, P. (2014). "A contribution to the history of assessment: how a conversation simulator redeems Socratic method". Assessment & Evaluation in Higher Education**,** 39(2); 195–204.
- Opara, I. M., & Uwah, I. V. (2017). Effect of long: Term vacation on mathematics academic performance of secondary school students in Port Harcourt city local government area. Nigeria. International Journal of Multidisciplinary Research and Development, 5(9) 21-27.
- Opara, I.M. (2016). Test construction and measurement Concepts and Applications Owerri: Career Publishers.
- Opara, I.M. (2018). Teachers' characteristics as determinants of their attitude towards continuous assessment practices. American Journal of Educational Research, (6), 10; 1351-1355.
- Rasul, S., & Bukhsh**,** Q. (2011). A study of factors affecting students' performance in examination at university level. Procedia - Social and Behavioral Sciences, 15; 2042-2047.
- Siegle, D. (2015). Standard scores. Retrieved on February 16, 2015 from www.gifted.ucom.ed/.../research/
- Suskie, L. (2004). Assessing Student Learning. Bolton, MA: Anker.
- Ukwuije, R. P. I. (2003). Peanuts educational statistics. Port Harcourst. Celwil Nigeria.