TEACHERS' BIAS IN ASSESSMENT PROCESS IN SELECTED SCHOOLS' SUBJECTS IN EKITI STATE, NIGERIA

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ABSTRACT

This study adopted ex-post-facto research design to investigate teachers' bias in assessment process in selected secondary schools' subjects. Cluster sampling technique was adopted to select ten schools from the three senatorial districts and simple random technique to select 500 students per subject making a total of 50 students per school. The research questions raised were analyzed using regression model of statistical moderation coefficient of skewness, Pearson-product-moment correlation statistical technique and analysis of variance (ANOVA). The result confirmed the existence of teachers' bias in the assessment process in mathematics, English language and biology with prevalent errors of leniency and severity. Based on this, the study recommended the need for standard statistical moderation of school based assessment scores that would minimize the errors of leniency and severity in the assessment process which will ascertain quality control of teacher assessment scores in Nigeria secondary schools.

Keywords: Severity, leniency, teacher assessment scores

INTRODUCTION

Errors in measurement denotes discrepancies between the obtained scores and the corresponding true scores, therefore, the equation of true score is given as X = T+e ------- (I)

Where X is the obtained scores

'T' is the true score and

'e' represents error of measurement. From the equation one above, e = X-T which is equation of error of measurement, "e" can either be positive or negative. If errors are positive, the obtained score X will be higher than the true score T, conversely if e is negative, the obtained score will be lower than the true score this view led to the need of moderation of assessment process in secondary schools in Nigeria (Garguilo, 1987, FGN, 1981 & 1987; Bandele, 1989; Mac Cann, 1995; Abe, 1995, 2006, 2007a, 2007b, 2009, Alonge & Abe, 2007)

However, errors of measurement can arise from innumerable sources Onocha & Okpala (1995) argued that, the most important source of error in measurement as item selection, test administration, test scoring and systematic error of measurement. Gravetter & Forzani (2003) posited that, inconsistency in measurement comes from observer error environmental changes and participant changes.

In view of this, teachers' bias in the assessment process is associated to the errors committed during the course of awarding scores to the students which might be an error of central tendency, leniency and severity errors (Mac Cann, 1995; Onocha & Okpala 1995; Bandele, 1989& 1997, and Abe, 1995, 2002, 2006 2007a, 2007b, 2008 & 2009). Anastasi (1982) argued that, error of central tendency connotes the tendency on the part of the teacher to bunch scores in the middle of a continuum while avoiding the extremes. Leniency error refer to conscious effort of a teacher to bunch scores in high level that above the actual score expected of the students

such teacher committed leniency or generosity error while severity error as opposed to leniency is the tendency of the teacher to assess the students on the low or undesirable scores which negates the purpose of moderation of school-based-assessment scores to determine the final grades of the students at both junior or senior secondary schools. These errors in assessment process necessitated statistical moderation of internal assessment scores before combining with external assessment scores (Smith, 1978; Awuwoloye, 1998; Bandele 1989; Mac Cann, 1995, Abe, 1995, 2006, 2007a, 2007b& 2009).

In assessment process, error is calculated statistically as raw score-moderated score = Error, which may be negative or positive. While moderated scores are derived through the statistical moderation models, such as t-scores method described by Abe (1995 & 2002) as zero model of statistical moderation because of the arbitrary mean of 50 and standard deviation of 10 and Mac Cann (1995) called it as conversion of raw scores to statistical unit for polynomial transformation model which was termed as standard model for moderation of school-based assessment scores.

Other model according to Abe (2006) and Bandele (1989) to derived moderated scores are scaling, mapping and regression models. Bandele (1989) in his finding suggested limit of tolerance of error in assessment process. While limit of tolerance is defined by $+N/Xj-Xi/ = N$. where: Xj = Marks to be moderated

Xi = Moderated mark

N = Sample size severity of moderation

Indication $Xj > Xi$, significant if $Xi-Xj > N/Xi-Xj/N$. Not statistical significance leniency of moderation indication $Xj < Xi$. Significant if $Xi -Xj < -N/Xi-Xj/$ (Bandele, 1989 and Abe 2006).

However, severity of moderation is as a result of leniency in assessment while leniency of moderation is as a result of severity in assessment. Hence severity of moderation is adjusted by subtracting $X -Xj/2 = K2$ to Xmod to given Xmod - K2 as adjusted

mark where K1, K2 are positive rational numbers and Xmod is moderated assessment scores. Thus standard quadratic polynomial transformation model strictly emphasis on the distributive nature of the assessment scores as means of determine the existence of teacher's bias which stands as bench mark for the need for moderation of school-based assessment scores at secondary schools level. In view of this, the researcher intends to investigate the existence of teachers' bias in selected subjects at senior secondary schools in Ekiti state, Nigeria. The problem of investigation in the study is associated with the teacher's bias as related to assessment process in schools due to arbitrary or spurious award of marks by the teachers in the secondary schools in addressing this problem; the following research hypotheses were formulated for the study.

RESEARCH HYPOTHESES

Ho_1: There is no significant relationship between leniency and severity error in TASS1, TASS2 and TASS3 in Mathematics, English language and Biology.

Ho_2: There is no significant difference in the teachers' bias in assessment process in mathematics, English language and Biology.

MATERIALS AND METHODS

This study adopted ex-post -facto research design which involved collection of data in order to determine whether and to what degree a relationship exists between two or more quantifiable variables. Gay, (1996); Anderson, (1998); Campbell & Stanley, (1966) describe it as an attempt to solve the problem of randomization and control of variables in educational research since there are no real treatment, nothing is being manipulated but the variables of interest are merely observed, found and used for the purpose, in which the study is designed. Chapin (1955) who

formulated the design describes as the one in which there was no treatment and manipulation of the subject instead it involved the collection of the data from records.

The target population comprised all senior secondary schools in Ekiti State, Nigeria. Cluster sampling technique was adopted to select ten schools from three senatorial districts while simple random sampling technique was used to select five hundred students per subject making a total of fifty students per school. The researcher made personnel contact with all the selected schools and collected the school copy of teacher's assessment scores (TASS1, TASS2 and TASS3) for three consecutive years (2003-2007). The data were analyzed using microsoft excel. It should be noted that, the TASS1, TASS2 and TASS3 denote teachers' assessment scores for SS1, SS2 and SS3 respectively while WASCE stands for moderating instrument.

RESULTS AND DISCUSSION

Table 1: Distribution of students scores among the senior secondary schools in Ekiti State, Nigeria.

Subject	N	TASS per year	Means	D	Skewness coefficient
Mathematics	500	SS1	48.08	17.02	0.18 Positive
		SS3	49.42	13.34	0.54 Positive
English language	500	SS1	49.07	13.28	0.94 Positive
		SS2	49.08	13.69	-0.11 Negative
		SS3	48.83	12.32	-0.14 Negative
Biology	500	SS1	48.83	13.84	-0.62 Negative
		SS2	51.53	13.89	-0.42 Negative
		SS3	50.07	14.49	-0.15 Negative

Source: Fieldwork, 2009

This will be analyzed using the formula of skewness:

Sk = Mean = Mode/Standard Deviation

Table 1 reveals the indication of teacher's bias in the assessment process among the senior secondary school in Ekiti State, Nigeria. The coefficient of skewness in teacher's assessment scores (TASS1, TASS2 and TASS3) in Mathematics and TASS1 in English language were positive, while TASS2 and TASS3 in English language and TASS1, TASS2 and TASS3 in Biology were negatively skewed as an indication of teacher's bias in there assessment process in Mathematics, English language and Biology

Table 2: Hypothetical prevalent error committed in teacher's assessment process in Mathematics, English Language and Biology in a particular school.

Subject	CRS	MS	RS-Mod	Result
Mathematics				
SS1	60	50.68	9.32	Leniency
SS2	69	57.06	12.94	Leniency
SS3	70	64.84	15.46	Leniency
English Language				
SS1	50	46.84	3.16	Leniency
SS2	60	54.24	5.76	Leniency
SS3	69	65.12	3.08	Leniency
Biology				
SS1	70	60.46	9.54	Leniency
SS2	75	63.31	11.69	Leniency
SS3	80	75.80	14.20	Leniency

N/B: Class Row Score (CRS), Moderated Scores (MDS).

Source: Fieldwork 2009.

This was analyzed using regression model of statistical moderation to get the nature of teacher's bias as whether leniency or severity. From the table 2 above, the prevalent error committed by the assessors is leniency error as a justification for the need of statistical moderation of Teacher's assessment process. The table

also illustrates the how the errors are been derived and the result justifies the existence of leniency error in the three subjects. However, the common teacher's bias in the assessment process in schools was severity error in mathematics while the prevalent error in Biology and English language was leniency error.

Ho_1: There is no significant relationship between leniency and severity error in TASS1, TASS2 and TASS3 in Mathematics, English language and Biology.

Table 3: Correlation analysis of leniency or severity error in Mathematics English language and Biology

Subject	LSTASS1 and LSTASS2	LSTASS1 and LSTASS2	LSTASS2 and LSTASS3
Mathematics	0.982	0.970	0.975
English Language	0.994	0.660	0.628
Biology	0.986	0.978	0.977

N = 500 per subject P< 0.05; **Source:** Fieldwork, 2009.

The table 3 reveals very high and positive strength of relationship between the leniency and severity errors. The teacher in Mathematics English language and Biology while, at P<0.05 there where significant relationship in leniency and severity errors in TASS1, TASS2 and TASS3 in Mathematics, English Language and Biology hence, the hypothesis was rejected.

Ho_2: There is no significant difference in the teacher's bias in assessment process in mathematics, English language and Biology.

Table 4: Summary on teacher's bias Mathematics language and Biology

Subject	SSbg	SSwg	dfbg	Msbg	Mswg	dfwg	Fcal
Mathematics	3328.37	41876.89	2	1664.83	27.894	1497	59491
English lang.	346.98	80476.96	2	173.49	53.76	1497	3.23
Biology	1853.44	24912.78	2	926.72	16.64	1492	55.69

Source: Fieldwork, 2009

Table 3, above shows significant differences in leniency or severity in TASS1, TASS2 and TASS3 in Mathematics, English language and Biology with f. calculated and 55.69 with dfbg 2 and dfwg 1497, these values were at P<0.05, therefore post-hoc analysis was carried out using scheffe multiple comparisons.

Table 5: Scheffe Multiple comparisons of TASS1, TASS2 and TASS3 in Mathematics.

Mean	Comparisons	TASS1	TASS2	TASS3
- 1.918	TASS1	*	*	
1.691	TASS2		*	*
	TASS3			

Denoted pairs with significant difference at P<0.05, the post-hoc analysis on the table reveals a significant difference of teachers bias in TASS1, TASS2 and TASS3 in Mathematics while significant difference existed between TASS1 and TASS2, TASS1 and TASS3 and between TASS2 and TASS3.

Table 6: Schefte multiple comparison of TASS1 and TASS2 and TASS3 in English language.

Mean	Comparisons	TASS1	TASS2	TASS3
- 1.9438	TASS1			
-0.9294	TASS2			
-0.9179	TASS3			

Post-hoc in English language shows no significant difference in Teacher's Bias in TASS1, TASS2 and TASS3.

Table 7: Scheffe multiple comparison of TASS1, TASS2 and TASS3 Biology.

Mean	Comparisons	TASS1	TASS2	TASS3
1.1698	TASS1	*	*	
1.553	TASS2			*
0.171	TASS3			

Indicated pairs with significant difference at P<0.05, the post-hoc analysis shows that a significant difference in teacher's bias in TASS1, TASS2 and TASS3 in Biology and this occurred between TASS1 and TASS2, TASS1 and TASS3 and between TASS2 and TASS3. The foregoing has shown an analytical review of teacher's bias in assessment process in selected school's subjects in Ekiti state, Nigeria.

The finding shows that, the assessment process in mathematics TASS1 TASS2 and TASS3 and TASS1 in English language were positively skewed while TASS1, TASS2 and TASS3 in English language were negative skewed is an indication to existence of teacher's bias in the assessment process among the senior secondary schools in Ekiti state the findings was consistent with the findings of Mac Cann (1995), Abe (2006), Alonge and Abe (2007&2009) who find that, existence of skewness in the school-based assessment necessitates the need of statistical moderation before combining with the external assessment award certificate to any students at either Junior certificate examination NECO or WAEC.

Also, the finding strictly supports the assertions of Abe & Abe (2000); Afemikhe & Onyemunwa (1997); Olaitan & Ndomi (2000) which stated that, the purpose of skewness is to examine whether scores are positively or negatively skewed distribution the finding also shows the existence of errors of leniency and severity in Mathematics, English language and Biology which confirms teacher's bias in the assessment process at senior secondary school level in Ekiti state, Nigeria this support the findings of Abe(2006,2007a; 2007b;2009&Bandele,1989) in which their findings show leniency or severity in continuous assessment scores at Junior secondary schools, Ondo State, Nigeria, using regression model of statistical moderation.

However, the prevalent error frequently committed by the

teachers was leniency error in biology and English language while bverity error was committed by the mathematics teachers; this also was in line with findings of Abe (2006&2009). The result of this study equally reveal very high and positive strength of relationship in teacher's bias, while at P<0.05, there was significant relationship between teacher's bias in TASS1, TASS2 and TASS3 in Mathematics, English language and Biology.

This finding consistently support the finding of Abe (2006) but at variance with the finding of Bandele (1989) and Mac Cann (1995) which show low and positive relationship in teacher's bias in integrated science, Mathematics, and English language at Junior secondary school. Finally, there were significant differences in teacher's bias among TASS1, TASS2 and TASS3 in the three subjects at P< 0.05. This also was not in support of finding of Bandele (1989) but in consonances with that of Abe (2006) who's his finding shows significant difference among the leniency and severity in CA1, CA2 and CA3 in Mathematics and Biology.

CONCLUSION AND RECOMMENDATIONS

Considering the findings of this study, it was concluded that, the present state of assessment process needs to be statistically controlled since it reveals the existence of errors which negate the motive of continuous assessment policy of FGN (1981& 1987) that teachers should be involved in the assessment of their students' results at both junior and senior secondary schools in Nigeria. One of these errors might be the reason why WAEC does not include school-based-assessment scores in the award of student certificate NECO tried it at their inception the result was seriously criticized by the stakeholders in education in Nigeria. Thorough assessment process should be incorporated in curriculum schools.

Based on the findings of this study, it was recommended that regular workshop and seminar should be organized for teachers

by the State and Federal Ministry of Education on the implications of arbitrary marks awarded to their students, standard statistical moderation model that would minimized the errors of leniency or severity in Nigerian schools should be adopted by the ministry of education as against T-Score Model which favors the averagers in schools. This is in a bid to achieving an enhanced and reliable continuous assessment scores at both junior and senior secondary schools in Nigeria

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