Comparative Analysis of Transformed Continuous Assessment Scores across Southwest States Nigeria

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Abstract: This study investigated the extent to which transformed continuous assessment scores are comparable across states in South West Nigeria. The study employed survey and cross-sectional design. The sample consisted of 2520 JSS III students selected from 36 secondary schools in 18 Local Government Areas based on multistage, stratified and random sampling techniques. Data were collected directly from the Ministries of Education, continuous assessment Units with a proforma titled Continuous Assessment Retrieval Format. The data collected were subjected to inferential statistics. ANOVA was used to test null hypothesis at 0.05 level of significance. There was a significant difference in transformed continuous assessment scores in selected school subjects when true score, predictive true score and derived true score were used across the sampled states. Based on the findings, it was recommended that secondary school teachers should be acquainted with the techniques of generating reliable and valid continuous assessment scores. Teachers should be trained the procedure to moderate (transform) continuous assessment scores in schools across the states*.*

Keywords: True score; derived true score; predictive true score; transformed score, continuous assessment.

1. Introduction

One of the noticeable changes in Nigerian educational system since independence in 1960 is the introduction of Continuous Assessment Scheme which on the face value, deviated from the one inherited from the colonial masters, summative evaluation. Summative evaluation emphasizes assessment conducted at the end-of-term or year or end-of-session or end-of-course and gloves over the formative evaluation.

The objectives of continuous assessment in Nigeria schools are multi-dimensional; basically to improve the standard of teaching, make learning more meaningful, develop sound attitudes and manipulations of skills, frequent assessment of students' (marking class attendance), not relying on one examination among others. The present conduct of continuous assessment in schools seems to indicate that the objectives of the 6-3-3-4 system of education have not been achieved because some problems inherited in the former 6-5-2-3 system of education are still prevalent and even more compounded as observed by the researcher. Prominent among these problems, are the –do-or-die syndrome in examination, examination malpractices like cheating, copying, buying question papers, lobbying for marks in teachers' quarters, paying for people (mercenaries) to write examination on one's behalf, greater emphasis on paper qualifications and so on.

Egbeyemi (2002) noted that the alarming rate of failure and poor performance of students at both the internal and external examinations are pointers to the need for a workshop on improving the practice of Continuous Assessment in our schools. In the same vein, Alonge (2002) observed that examination and assessment in the schools system today have been misinterpreted in the sense that

parents and students have the impression that what is important in schooling is to obtain a certificate (either through fair or foul means) at the end of the course.

Mkpa (1989) noted that teachers deliberately set simple continuous assessment tests in order to record high percentage passes in their class to convince the inspectors of schools that they taught so well that most of their students passed well. Badmus and Omoife (1998) observed that some teachers set easy tests while others may set difficult tests. Flaws might be in the test items being conducted which may give room for over estimation or under estimation of continuous assessment scores. This could have effect on the extent to which continuous assessment scores are comparable among schools.

However, Comparability of standard of continuous assessment had been one of the major problems being identified by scholars, stakeholders, since inception of 6-3-3-4 system of education. This problem seems to arise as a result of difference in personnel and the practice of continuous assessment. Other problems associated with this include examination malpractices, -do-or-die syndrome in examinations, too much of paper qualification, quality of teachers, lack of funding, attitude of students, parents and teachers towards continuous assessment, teachers' integrity, lack of commitment, quality of assessment instruments that vary from teacher to teacher and from school to school. Other problems include inconsistency in instrument administration, student's characteristics, categories of schools, differences in procedures of scoring and grading and collation of continuous assessment grade. Bandele (1988) argued that variation in teachers and schools was accountable for non uniformity of performance standard.

It is assumed that transformed scores are useful in comparing continuous assessment scores. The continuous assessment scores of a student tells one nothing about the student since one has no idea on how other students are scored. One does not know the total number of questions on the assessment instrument used to generate their scores nor whether some have easier questions than the others. True scores, predictive true scores, Z-scores, T-scores and Derived true scores are necessary for inter and intra individual interpretation. These transformation models will assist in a meaningful combination of continuous assessment scores in J.S.S. 3 to solve problem of comparability of standard.

The problem of non-uniformity in the quality of assessments instruments, consistency in assessment administrative procedure and procedure for scoring and grading which varies from teacher to teacher. Some schools seem to use this advantage to unduly inflate continuous assessment scores of the students to favour their schools. Juola (1976) stated that inflated grades provide inaccurate feedback which may point to intellectual dishonesty. To harmonize these scores, Burger (1998) suggested that there should be an acceptable performance standard that should not be viewed as minimum competency but should set high and achievable expectation for students and not be low that everyone meets or exceeds it. Beside, some uniform grades are attached to scores like A, B, C, D, E, F despite the fact that there are no uniform criteria or parameters by which such conclusions are made. Not only that some school registrars seem to manipulate continuous assessment scores with or without the knowledge of the subject teachers before submitting continuous assessment scores to ministries of Education to be used with JSS examination for the award of JSS certificate. Alonge (2004) who stresses that to facilitate meaningful analysis and interpretation, raw scores are transformed to other scales. The study therefore investigated whether there is any difference in the transformed continuous assessment scores for the selected school subjects among the sampled schools, states and across the subjects.

2. **Research Hypothesis**

The hypothesis was tested at 0.05 levels of significance.

Ho: There is no significant difference in transformed continuous assessment scores for the selected school subjects (English Language and Mathematics) across the states.

3. Method

This study employed survey and cross-sectional design. The population consisted of all public Junior Secondary School three (JSS3) students in South West Nigeria. These are students who were in JSS 3 in 2005/2006 and 2006/2007 that were selected from 36 secondary schools in 18 Local Government Areas in three States based on multi-stage, stratified and simple random sampling techniques. Eight hundred and forty students were selected for the period of two years in each sampled State. Multi-stage and stratified sampling techniques were employed to select the States, Local Government Areas, Schools and Students who continuous assessment scores were used for the study. A Proforma titled "Continuous Assessment Scores Retrieval Format" was used to collect continuous assessment scores of the students selected for the study. These are continuous assessment scores in English Language and Mathematics sent to the respective Ministries of Education in the various states for the 2005/2006 and 2006/2007 sessions. English Language and Mathematics were chosen because they were compulsory (core) subjects at Junior Secondary School. ANOVA analysis was used to test the hypothesis generated at 0.05 levels of significance.

These are the transformation models used in the study:

$$True\ score\ =\ Raw\ score - error\ score \qquad (1)$$

$$Predictive\ true\ score\ (P) = r\ (raw\ score - mean\ score) + raw\ score \qquad (2)$$

$$Z-score\ =\ (raw\ score - mean\ score)/standard\ deviation, SD \qquad (3)$$

$$T-score\ =\ 50 + 10Z \qquad (4)$$

$$Derived\ true\ score\ =\ P \pm 0.1r\ (T-score - 50)SD \qquad (5)$$

4. Results

Ho: There is no significant difference in transformed Continuous Assessment scores for the selected school subjects across the states.

Data were analyzed using Analysis of Variance as presented in tables 1, and 3.

Table 1. ANOVA summary transformed continuous assessment scores for english language across states

		Source of variation	Sum of squares	Df	MSS	F cal	Ftab
English Language	**True Score**	Btw groups	21522.676	2	10761.338	1439.118	3.00
		within groups	18821.450	2517	7.478		
		Total	40344.127	2519			
	Predictive True Score	Btw groups	872.154	2	436.077	38.201	3.00
		within groups	28732.029	2517	11.415		
		Total	29604.183	2519			
	Z-score	Btw groups	0.003	2	0.002	0.002	3.00
		within groups	2516.228	2517	1.000		
		Total	2516.232	2519			
	T-score	Btw groups	0.029	2	0.014	0.002	3.00
		within groups	22646.056	2517	8.997		
		Total	22646.085	2519			
	Derived True Score	Btw groups	77321.309	2	745.294	4012.245	3.00
		within groups	24252.971	2517	6.855		
		Total	101574.28	2519			

Table 1 shows that F-calculated for continuous assessment scores English language across states for true score is 1439.116, predictive true score (38.201) and derived true score (4012.245) were significant at 0.05 alpha level while Z-score was 0.002 and T-score (0.002) were not significant at 0.05 alpha level.

Scheffe's Multiple Comparisons Analysis showing where the differences existed when transformation models were used on continuous assessment scores across the states as showed in table 2.

Table 2. Scheffe's Multiple Comparisons Analysis on true score, predictive true score and derived true score for english language across states

True score Eng	Ekiti	Ogun	Oyo
Ekiti			
Ogun	*		
Oyo	*	*	
Pred True score Eng			
Ekiti			
Ogun	*		
Oyo	*	*	
Derived True score			
Ekiti			
Ogun	*		
Oyo	*	*	

Tables 2 reveals that significant mean differences existed between Ekiti, Oyo and Ogun states in transformed Continuous Assessment scores through true score, predictive true score and derived true score in English Language.

Table 3. ANOVA summary transformed continuous assessment score for mathematics across states

	Source of variation		Sum of squares	Df	MSS	F cal	Ftab
	True Score	Btw groups	1490.588	2	745.294	108.719	3.00
		within groups	17254.594	2517	6.855		
		Total	18745.183	2519			
	Predictive True Score	Btw groups	395.484	2	197.742	14.724	3.00
		within groups	33802.800	2517	13.430		
		Total	34198.284	2519			
Mathematics	**Z-score**	Btw groups	0.002	2	0.001	0.001	3.00
		within groups	2515.891	2517	1.000		
		Total	2515.893	2519			
	T-score	Btw groups	0.015	2	0.007	0.001	3.00
		within groups	22643.020	2517	8.996		
		Total	22643.035	2519			
	Derived True Score	Btw groups	14746.037	2	7373.018	660.682	3.00
		within groups	28088.971	2517	11.160		
		Total	42835.008	2519			

Table 3 shows that F-calculated on transformation models for Mathematics across states for true score was 108.719, predictive true score (14.724) and derived true score (660.682) which were all significant at 0.05 alpha level, while Z-score was 0.001 and T-score 0.001 were not significant at the same alpha level.

Scheffe's Multiple Comparisons Analysis showing where the differences existed across the states as showed in table 4.

Table 4. Scheffe's Multiple Comparisons Analysis of true score, predictive true score and derived true score for mathematics across states

True score Maths	Ekiti	Ogun	Oyo
Ekiti			
Ogun	*		
Oyo	*		
Pred True score Maths			
Ekiti			
Ogun	*		
Oyo		*	
Derived True score			
Ekiti			
Ogun	*		
Oyo	*	*	

Table 4 indicates that significant differences did exist between Ekiti and Ogun, and Ekiti and Oyo in true score and derived true score while significant differences also existed between Ekiti and Ogun, and Ogun and Oyo in predictive true score in Mathematics.

5. Discussion

The result indicated that there was a significant difference in the transformed continuous assessment scores in the selected subjects (English Language and Mathematics) across the states. This may be unconnected with the finding of Abbas (2000) that says continuous assessment scores may not be the true reflection of students' ability. When true score, predictive true score and derived true score were used to transform continuous assessment scores the selected school subjects (English language and Mathematics) across the states, a significant result was obtained. This finding is in line with the study of Ojerinde (1986) who stated that measuring instruments are all imperfect, so some errors exist in all measurements (continuous assessment tools). It means that the award of Continuous Assessment scores in English Language and Mathematics differ from state to state (Ekiti, Ogun and Oyo) making the scores difficult to be comparable (equivalent). In this regard, Garguilo (1987), Bandele (1993) and Akindehin (1997) maintain that the problem of comparability could be reduced through standardization of continuous assessment from the schools.

The result also showed that when Z-score and T-score were used for the transformation of continuous assessment scores for the selected school subjects across the states, there was no significant difference. This may be as a result of one being the transformation of the other, that is, T-score is a linear transformation of Z-score. When a score is skewed and transformed with the use of Z-score and T-score, it remains skewed. The finding support the study of Afolabi (1999) and

Howell (2002) who maintained that converting raw score to T-score is only a form of scaling and converting a mark from one scale to another cannot remedy incongruity or morbidity in the original score. While in the study of Ayodele (2010) he recommended the use of true score for the transformation of continuous assessment scores in English Language and Mathematics for comparability of standard. Post hoc analysis further indicated that significant differences did exist in transformed Continuous Assessment scores across the States. This study is in line with finding of Bandele (1988) that teachers and schools variations could be accountable for non-uniformity in performance. In the same manner, the different assessment instruments used by teachers introduced variability among teachers' standard (Rothman, 1995). Also, Nwabuisi (1987, 1988) studies revealed that teachers awarded false marks to pupils and some awarded marks to their pupils even on test never administered. Ogunboyede (2006) stated that there were continuous assessment units at various States Ministries of Education but no evidence of proper and effective monitoring.

The result showed there was a significant difference among selected school subjects when Continuous Assessment scores were transformed with the use of True score, Predictive true score and Derived true score while that of Z-score and T-score were not significant. Alonge (2004) said before comparing children's performance across subjects and across schools, there are need to process their raw scores in each subject. It has been a tradition /phenomena for parents/guidance to compare scores of their children/wards from various subjects and punish/beat/deny the children for getting low scores in certain subjects without consider some parameters like the contents, difficulty level and discriminating power of the items, mean score and so because they lack the knowledge of test score types and interpretations.

6. Conclusion and Recommendations

The transformed continuous assessment scores differ from school to school and among the States. Based on the findings, it was recommended that teachers should meet to construct Continuous Assessment instruments for uniformity on the schools bases, subject teachers should meet on state level on the ways to generate homogeneous continuous assessment scores and there should be a moderating exercise (with the use of true score) among the states for comparability of standard of Continuous Assessment scores.

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