CONSTRUCTION AND VALIDATION OF AN INSTRUMENT FOR EVALUATING TEACHING QUALITY IN OGUN STATE SECONDARY SCHOOLS, NIGERIA

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Abstract
This study sought to develop and validate an instrument for evaluating teaching quality in senior secondary schools in Ogun state, Nigeria. Instrumentation research design was adopted for this study. The population of the study comprised all Senior Secondary Two (SS2) students in Ogun State. Stratified sampling was used in selecting SS2 students and the teachers from all the 20 educational blocks in Ogun state. A total of 1580 students from the public schools were used for the study. Two research questions and two corresponding hypotheses were formulated to guide this study. The data collected were analyzed using descriptive and inferential statistics. The hypotheses were tested at 0.05 level of significance. Following the items development and validation process, two instruments were developed which are extracted from various related literature; Student Evaluation of Teaching Quality Questionnaire; for students' assessment of their own learning effectiveness and Teaching Quality Assessment Questionnaire; for evaluating teachers teaching quality by external evaluators (Quality Assurance Personnel). The hypotheses were tested using exploratory factor analysis for hypothesis 1, test -retest reliability for hypothesis 2. The result obtained includes; norms, for the participants' male and female (students and teachers) in the schools, high construct validity and reliability coefficient when compared with other standardized.
Keywords: *Construction, Validation, Instrument, Evaluation, Teaching Quality*
Introduction / Background

Introduction

Teaching is in no doubt one of the complex and most demanding profession. It is a profession that requires creativity and innovation. No educational system would achieve quality teaching without having quality teacher. Therefore, the quality of education at any level depends on the teachers and quality of teaching they give (Owoyemi and Adesoji, 2012). Learner centered teaching is regarded as the central issue of the 21st century. Consequently, the most powerful and engaging aspects of learning and students' collective experiences need to be backed up with the services of highly qualified teachers with the ability to deliver quality teaching (Tomlinson 2004). The teacher's ability to give quality teaching and make impact in the learners is one of the most important factors that affect learning (Ogbonnaya, 2008). This is because the quality of their teaching can either facilitate or hamper students' learning.

Teaching quality can be defined as the extent to which the teaching activities fulfil what it intends to accomplish in terms of objectives, purposes and functions. Practically, it constitutes a set of actions and activities that improve student outcomes. (Lloyd, Wittenstein, & Swanson, 2011). Maurli (2014) asserted that teaching quality is the effectiveness of the teaching force. According to Catano & Harvey, (2011), there are basically nine teaching quality competencies identified, these are communication, availability, creativity, individual consideration, social awareness, feedback, professionalism, conscientiousness `and problem solving.

Good teaching means teaching that conforms with the moral and rational principles of teaching practice, which invariably means that the content being taught meets the standards of the discipline in terms of both adequacy and completeness. The method used also is in accordance with the age, students' learning style and geared towards involving the capabilities of students associated with the content being taught. Quality teaching therefore becomes the foundation of good teaching which exemplifies the teacher expertise. Thus, good teaching could be observable when direct instructional model of teaching is ongoing. Successful teaching is teaching that produces the desired outcomes thereby giving students opportunity to acquire skills, knowledge and understanding at acceptable and reasonable level when they are engaged in the classroom. Teaching quality can be evaluated and assessed using (1) self-report, (2) peer report and (3) student report among others. Over time, student rating has dominated as the primary methods of measuring teaching quality (Bergstrand & Savage, 2013). Student evaluation of teaching quality is important when related to subject organization, impact of the teaching on their own learning, teacher's delivery and personality and not for evaluating content appropriateness of teaching goals and objectives (Berk, 2005).

Statement of the Problem

In the recent times, the evaluation of teaching quality especially at the secondary school level is becoming a major concern. The existing system of evaluating teaching quality has always viewed the students' test scores as the resultant impact of quality teaching. This system of evaluation has failed to address quality of teaching in the light of how much students learn and are involved in their own learning. If the need for evaluating the quality of teaching is to address its impacts on students' learning outcome in terms of how it improves learning, how students learn and how they are involved in their own learning, then the predetermined system of evaluating teaching which focuses on standardized test scores and students' results after test and examinations may not be much appropriate in addressing the issue of holistic learning. Considering this therefore, it is expected that this instrument should be improved in order to provide the students with the opportunity to evaluate teaching quality in terms of how teaching facilitate their own learning.

Research Questions

The following research questions guided this study:

1. To what extent will Teaching Quality Evaluation Instrument have construct validity?
2. To what extent will the Teaching Quality Evaluation Instrument have high test-retest reliability coefficient?

Research Hypotheses

Based on the research questions, the following research hypotheses were tested at 0.05 level of significance**.**

1. The Teaching Evaluation Instrument will not yield significantly construct validity
2. The Teaching Evaluation Instrument will not yield significantly high test-retest reliability coefficient**.**

Method

The design for this study is an instrumentation design. This design is incorporated in descriptive survey design. A study is instrumentation when it is targeted at constructing a new or modifying contents, procedures, or instruments of educational practices. This design is appropriate for this research because it is used to construct and validate suitable instrument for evaluating teaching quality among secondary school students.

A total number of one thousand six hundred and eighty (1680) students make up the sample. Also two teachers were randomly selected from each school, a total number of fifty- six (56 teachers) were selected while eight (4) assessors (quality assurance team) from Ogun State Ministry of Education Department of Research, Planning and Statistics were randomly selected to evaluate the teaching quality using the instrument constructed by the researcher – teaching quality Assessment questionnaire. While the student also evaluated the teacher using Student Evaluation of Teaching Quality Questionnaire. The researcher employed stratified sampling for the study. Twenty-eight co-educational secondary schools were selected using simple random sampling technique from the four Educational blocks (Egba, Ijebu, Remo and Yewa). Four zones were selected from the Egba,-Ijebu - Remo educational block respectively while two zones were selected from the Yewa educational block using stratified sampling.

Instrumentation

For the purpose of data collection, the following instruments were used for this study:

1. Students' Assessment of Teaching Quality Questionnaire
2. Teaching Quality Assessment Questionnaire.

1. Student Assessment of Teaching Quality Questionnaire

This is made up of 20-items on a 4 – points Likert scale, designed by the researcher. This instrument is designed to determine the student's opinion and perception on teaching quality considering how much they learnt and were involved in the teaching process. The students are expected to assess the quality of teaching delivered by a teacher using this instrument. Specifically, to determine how involved and how much students learnt during the teaching – learning process.

Sample items are presented following in the table below.

Table 1: STUDENT EVALUATION OF TEACHING QUALITY QUESTIONNAIRE.

Student evaluation of teaching quality	5 SA	4 A	3 D	2 SD
1. My teacher engages me while teaching				
2. My teacher ensures I am participating in the classroom				

2.Teaching Quality Assessment Questionnaire.

This is a rating scale designed by the researcher with use of related literatures to assess the quality of teaching. It consists of 30-items divided into six phases A (establishing a culture of learning), B (Instructional Quality and delivery), C (Managing Classroom Procedure), D (Content Pedagogical Knowledge), E (Presentations/ Instructional Resources) and F (Using Questioning as an Assessment Technique in Instruction). It is designed on a 4 – point Likert scale (Excellent, Satisfactory, Fair, Unsatisfactory). This instrument is to be used by the quality assurance team, principal or other school management board in assessing the quality of teaching being delivered by teachers. Sample of items are presented in Table 2 following

Table 2: Teaching Quality Assessment Questionnaire

A. Establishing a culture for learning	4 Excellent	3 satisfactory	2 Unsatisfactory	1 Poor
1. The teacher shows commitment to teaching				
2. The teacher ensures the student are involved to the teaching and learning process.				

The data collected from two instruments were treated statistically using both descriptive and inferential statistics. All hypotheses were tested at 0.05 level of significance. Descriptive statistics was used to show means, standard deviation and standard scores for norms and testing of the hypotheses. Two null hypotheses were formulated to guide the research. The frequency, percentage distribution, means and standard deviation was used to describe the demographic variables while Hypothesis 1 was tested using factor Analysis and Hypothesis 2 was tested using Test Retest Reliability test.

Table 2Descriptive of statistics of the respondents.

Distribution	Frequency (N)	Percentage (%)	mean	SD
Gender Student			1.44	0.49
Male		876	55.4	
Female		704	44.6	
Total		**1580**	**100.0**	
Age			1.56	0.64
16 years and below		820	51.9	
17 to 18		630	39.9	
19 and above		130	8.2	
Total		**1580**	**100.0**	
Gender of Observed Teachers			1.36	0.48
Female		35	66.07	
Male		21	33.92	
Total		**56**	**100.0**	

Source: Field work.

The evidence from table 2 shows the demographic characteristics of the respondents. The results show that about 55.4% and 44.6% are male and female student's respondents that participated, with mean and standard deviation of 1.44 and 0.49 respectively of which 51.9% are ages of 16 years and below, 39.9% are 17 to 18 years of age while 8.2% are within the ages of 19 and above years of age of mean of 1.56 and standard deviation of 0.64. It further shows that the total observed teachers for the instruments are 56 of which 35(66.07%) are female and 21(33.92%) are male with mean of 1.36 and 0.48

Test of Hypothesis

Hypothesis One: Teaching Quality Assessment instrument will not yield significantly high content validity.

In order to obtain information about the factorability of the data, the Kaiser Meyer Oikin (KMO) measure of sampling adequacy and Bartlets test of sphericity computed yielded 0.8, hence, the instrument is significant for factor analysis (Brace, Kemp and Sneglar 2006). The subsequent factor analysis performed provided 5 and 6 factors for student evaluation of their own learning and teaching quality evaluation instrument respectively.

The results are presented in the tables below.

Table 3KMO and Bartletts test for sampling adequacy

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.850
Bartlett's Test of Sphericity	Approx. Chi-Square	4294.987
	Df	190
	Sig.	.000

The table above shows the information about the factorability of the data. KMO value gave 0.850>0.60 and chi-square val of 4294.987 is significant at p (0.00<0.01). Thus, the items selected are good enough for factor analysis.

Table 4 Factor Analysis of Teaching Quality Evaluation Questionnaire (students' evaluation of their learning).

	Component	**Rotated component matrix**	**Eigenvalues**	**% variance**	**Cumulative %**
1	My teacher responded well to students' questions	.661	4.182	20.910	20.910
2	My teacher's delivery method encouraged my understanding	.598	1.290	6.450	27.360
3	I enjoyed my class	.583	1.225	6.126	33.486
4	The class activities motivated my learning	.496	1.174	5.870	39.356
5	I participated fully in the class	.410	1.032	5.160	44.516

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

Table 4 showed that 5 out of 20 items loaded significantly in student evaluation of their own learning and these five items have explained 44.90% of all the teaching quality while 43.566% explains for the remaining 22 items. The extracted factors were maximized using verimax rotation to reduce overlap and ensure distinctiveness of factors. Burt-Bank formula was then used to determine significant factor loadings and to ensure that no items loads significantly on multiple factors (Floyd & Widaman, 1995). Using Burt-Bank formula, a cut off value of 0.5 was obtained as the least value for inclusion. The result in table above shows that using a significant cut-off value of 0.5, five items loaded significantly in the instrument. From the result above, the null hypothesis is therefore rejected, and hence the Teaching Evaluation Instrument yielded a significantly high content validity for the student instrument.

Table 4 Communalities for teaching Quality Questionnaire

Factor Name	Extraction
The commitment of teachers in teaching	.675
The teacher ensures the student are devoted to the teaching.	.132
The teacher sets realistic expectation for the students learning	.814
The teacher's classroom interaction supports students learning	.690
The teacher encourages warm atmosphere in the class.	.846
The teacher makes the subject easy to understand	.729
The teacher gives relevant task to enhance the students understanding of the content taught.	.568
The teacher asks questions that make students think deeply	.799
The teacher teaches to improve students understanding and learning.	.567
The teacher provides clear answers to the questions	.568
The teacher maximization of instructional time is checked	.202
The teacher's establishment of a good classroom routine	.540
The teachers involving the students in carrying out the classroom routine.	.396
The teacher ensuring classroom routine is well understood by the students is checked	.288
The teacher's communication of the classroom routine well is assessed	.531
The teacher presentation of contents in various ways to enable students learn properly	.768
The teacher carrying the students along while teaching	.340
The teacher in-depth knowledge of the subject area.	.340
The teacher understanding of class situations.	.901
The teacher identification of students' needs while teaching.	.725
The teaching activities are properly aligned with the instructional outcomes.	.621
The teaching materials are appropriate for the student's age and learning.	.839
The teacher design class activities to challenge student thinking	.518
The teacher's delivery techniques engage the students intellectually	.663
The teaching activities and instructional resources encourage student's participation in the class.	.932
The teacher use of questioning technique to diagnose evidence of learning.	.285
The teacher assesses the students' level of understanding while teaching.	.557
The teacher allowing the student to ask questions while teaching	.768
The teacher evaluation of the student's and makes corrections.	.814
The teacher providing appropriate answers to the students' questions.	.425

Fig 4.2: scree plot (graphical representation of the extracted teaching quality evaluation questions items.

Table 5. Factor Analysis of Observation Instrument on Teaching Quality Evaluation Questionnaire

		Rotated component matrix	**Initial Eigenvalues**	**% variance**	**Cumulative %**
e5	The teaching activities and instructional resources encourage student's participation in the class.	.963	17.844	59.480	59.480
d4	The teacher understands class situations.	.947	4.429	14.765	74.245
a5	The teacher encourages warm atmosphere in the class.	.925	2.977	9.922	84.167
e2	The teaching materials are appropriate for the student's age and learning.	.911	1.974	6.579	90.746
f4	The teacher assesses the student's evaluation and makes corrections.	.906	1.565	5.216	95.962
a3	The teacher sets realistic expectation for the students learning	.906	1.211	4.038	100.000

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 37 iterations.

Table 6 shows that 6 out of the 30 items loaded significantly in teaching quality evaluation questions and this 6 has explained 100% of all the teaching quality.

The extracted factors were maximized using Verimax rotation to reduce overlap and ensure distinctiveness of factors. Burt-bank formula was then used to determine significant factor loadings and to ensure that no items loads significantly on multiple factors (Floyd & widaman, 1995).

The result in table above shows that using a significant cut-off value of 0.5, six items loaded significantly in the instrument. From the result above, the null hypothesis is there for rejected, and hence the score of participants in Teaching Evaluation Instrument yielded a significantly high content validity for the Teaching Quality Evaluation Questionnaire.

Table 6 Communalities for (students' evaluation of their learning)

Factor name	**Extraction**
My teacher teaches with interest	.434
My teacher shows concern for our learning while teaching	.630
My teacher understands when I am not following in the class	.506
My teacher explains the class expectation and procedure before teaching	.417
My teacher asks questions that help me to understand the subject well	.530
My teacher explained the content to my understanding	.418
The teaching activities were quite explanatory	.487
My teacher responses to my questions correctly	.466
My teacher allows the students to ask questions	.282
My teacher carried everyone along while teaching	.460
My teacher communicates the content to my understanding	.530
My teacher knows the subject.	.469
I like my teachers teaching evaluation technique.	.377
My teacher covered the teaching objectives stated	.248
I participated fully in the class	.437
The class activities motivated my learning	.392
My teacher responded well to students' questions	.492
The class was participatory.	.499
My teacher's delivery method encouraged my understanding	.439
I enjoyed my class	.392

Hypothesis Two: Teaching Quality Evaluation Instrument will not yield significantly high test-retest reliability coefficient.

Table 7: Test- Retest reliability and Consistency Coefficient

Group	N_1	N_2	- X_1	- X_2	SD_1	SD_2	Test retest		Cronbach Alpha		Split half	
							r-cal	p-val				
Teachers	28	28	59.03	58.24	15.87	15.48	0.568	0.04	0.974		0.953	
Students	790	790	31.63	31.83	6.33	6.13	0.020	0.76	0.806		0.749	

Significant at $p<0.05$, df = 27 and 789

In order to determine the reliability and consistency coefficient of the teaching quality instrument, a test -retest analysis, cronbash Alpha for internal consistency and split -half method was calculated using 56 teachers and 1, 580 students slated for the study.

The result in table 7 indicates that teaching quality instrument has a significant high test -retest and internal consistency reliability coefficient with teaching quality evaluation having reliability coefficient of 0.974 and split – half method of reliability coefficient of 0.953 while the student evaluation of their own learning instrument recorded a test -retest coefficient of 0.806 and split -half reliability coefficient of 0.749.

Following the result therefore, hypothesis two which states that teaching quality Instrument will not yield significantly high test- retest reliability and consistency coefficient is hereby rejected for teaching quality evaluation instrument and accepted for student evaluation of their own learning instrument. This result reveals that with the teachers' instrument having p (0.05>0.04), and the student having (0.05<0.07), this depict that the teachers instrument is significant while the student instrument is not.

Discussion of Findings

Hypothesis one states that Teaching Quality Evaluation instrument will not yield significantly high construct validity. The result of the finding agrees with the researcher Anastasi and Urbina (2004) which asserts that before a test instrument can be used with assurance, information concerning the norms, reliability and validity of the test for its specific purposes must be obtained.

Hypothesis two states that Teaching Quality Evaluation instrument will not yield significantly high test-retest stability and internal consistency. The research finding identifies with researcher Richmond, (2006) which asserts that reliability is the ability of a test to give a consistent result, no psychological test can be of value unless it yields consistent or reliable measure. According to Thompson (2004), reliability is a property of the scores obtained when the test is administered to a group of people on an occasion and under specific condition.

Conclusion

Based on the preceding discussion, the following conclusions were drawn:

1. The instrument for evaluating teaching quality has low construct validity when compared to other standardized instrument for evaluating teaching (Danielson teaching framework and student perception of teaching questionnaire). Hence, making it a valid instrument
2. With the teaching quality instrument yielding high reliability, this shows that the instrument is useful for evaluating and appraising individual teachers on the quality of classroom instruction given.

Recommendations

Based on the findings of this study, the following recommendations are put forward for consideration:

1. There will need to adopt the teaching quality assessment instrument as a standardized instrument for appraising teachers in the classroom.
2. In evaluating the quality of teaching given by individual teachers using teaching quality assessment instrument, student assessment of teaching quality instrument could be used alongside for effective and objective feedback.

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