Development and Validation of a Scale to Measure Quality Education in Oyo State Secondary School

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The study developed a scale to measure the quality of education in Oyo State secondary schools. It also determined the scale's factor structure, construct validity, and reliability. The population comprised all secondary school teachers in Oyo State, from which a sample of 630 teachers participated. Relevant items were generated from the literature and assembled after professional moderation. An instrument titled "Quality of Education Questionnaire" was used to elicit data from the teachers. Data collected were analyzed using Principal Component Analysis and other psychometric methods. The results revealed three factors: school facilities and management, students'/staff development and school policy, and students' engagement. In all, 27 items were retained using Horn's (1965) parallel analysis of the item reduction procedure. McDonald Omega and Cronbach Alpha coefficients for the final scale items were 0.78 and 0.79, respectively. The study demonstrated that the instrument possesses adequate psychometric properties that are appropriate and capable of measuring the quality of education in Oyo State secondary schools.

Keywords: validation, scale, quality education, principal component analysis, reliability

INTRODUCTION

The most effective tool we have for enlightening ourselves is education. The goal of education has always been to empower students and transmit knowledge and skills; thus, it is crucial to remember that the education one receives must meet a specific standard. Education is the most effective tool for shaping the future of a country, and it has been seen as an essential aspect as well as the bedrock of human development. Quality in education is vital, given that what students learn affects their philosophical mindset. The quality of education to the growth and development of a nation can never be overemphasized. So, the kind of education one is exposed to affects their day-to-day life in terms of lifestyle and the decision one makes. Education is an essential and primary education to cultivate knowledge and civilize people for their all-round development.

The education issues in Nigeria seem to be debatable and researchable as well. The student and the educator are two critical participants in education. The student is given information or instruction from the educator, who provides information or instruction to the learner. The learner pays for their education via their parents through tuition or taxes, and the teacher is paid for delivering it. While the educator pursues a profession in teaching, the student is subjected to compulsory education. The learner expects to learn from the educator, while the educator has responsibilities to expose and disseminate new information to learners. For the child's education to be successful, the relationship between the educator and the learner must be supported by all other stakeholders like the parents, government, and school administrators. According to

the international report on world school systems (McKinley, 2008), an educational system's excellence can never surpass that of its teachers. The study demonstrates that teaching and learning would continue even if a classroom were stripped of all furniture, including computers, interactive whiteboards, seats, and tables, leaving only a committed teacher. Therefore, education is impossible without the teacher.

What does quality mean from the perspective of education? Various scholars' (Adams, 1993; Asiyai & Oghuvbu, 2009; Asiyai, 2013; Furqatovna et al., 2022; Ji, 2009; Obadara & Alaka, 2013; Ofor-Douglas, 2022) definitions of quality in education exist, testifying to the complexity and multifaceted nature of the concept. Quality refers to the value placed on something or a desirable characteristic of a product or service that differentiates it for the person seeking the attribute. Obadara and Alaka (2013) opined that quality is the extent to which a good or service conforms to the established standard that makes it superior to other establishments with similar goals. Oguildinikpa (2015) stated that quality is a sign of excellence that should conform to a given standard which could be seen in the areas of teaching, learning, research, and quality of students, staff, and curricula.

Deliberate action was taken in 2015 by 195 nations to concur with the United Nations on Sustainable Development Goals (SDGs) 2030 agenda to change the world for the better; amidst the outlined seventeen SDGs was the provision for quality education as the fourth SDGs for all categories of students from PK-12 schools to the highest level of education. The United Nations recognized the significance of quality education as it (quality education) will determine the progress in other sectors of the country; little wonder why it was incorporated among the SDGs. When quality education is undermined at any level (i.e., PK-12 school to higher school) of education, development in other sectors of the economy will be a mirage. Quality education can be sustained by conducting quality control as introduced by International Test Commission (2013) guideline. Quality education is assured to a large extent when quality control is in place.

THEORETICAL FRAMEWORK

According to Ndiomu (1989) in Asiyai (2013), quality education is relevant and reflects the needs of society. In addition, it is an education characterized by adequate funding, adequate teaching staff, exemplary policy implementation, provision of information and communication technology, training and retraining of teachers, etc. Today, there is considerable agreement on the basic dimensions of quality educational; however, quality education includes: learners who are healthy, well-nourished, and ready to participate and learn, as well learners who are supported in learning by their families and communities, environments that are healthy, safe, protective, and gender-sensitive, and provide adequate resources and facilities; Content that is reflected in relevant curricula and materials for the acquisition of basic skills, especially in the areas of literacy, numeracy and skills for life, and knowledge in such areas as gender, health, nutrition, and peace; Processes through which trained teachers to use child-centered teaching approaches in well-managed classrooms and schools and skillful assessment to facilitate learning and reduce disparities; Outcomes that encompass knowledge, skills, and attitudes, and are linked to national goals for education and positive participation in society (Asiyai, 2013; Kirikkaleli et al., 2021; Olanrewaju & Omoponle, 2017; Opesemowo et al., 2022). Quality education significantly impacts technology and economic growth (Kirikkaleli et al., 2021), and the role of education in promoting economic well-being as well as technological innovation to measure national development (Obadara & Alaka, 2013). In the submission of Bada (2012), quality education can be described as functional education emphasizing both the educational system's theoretical and practical parts. Education emphasizes social responsibility, job orientation, political participation, spiritual and moral values, and, most importantly, self-reliance after school.

Colditz (2014) upholds that only an excellent school can deliver quality education. According to Colditz (2014), a quality school is a place where: quality teaching and learning culture are evident; there are quality educators who are willing to go the extra mile; there is excellent leadership; parents are involved; there is good administration and governance; and disciplined students. Subsequently, it becomes eminent to use a measuring instrument to ascertain the quality of education. A scale is a tool used by researchers to measure psychological constructs, and it was created to record a person's perception, feelings, and attitudes about a

concept. It is a response format presented to participants to ascertain their satisfaction with a particular item or statement. In addition, it is a set of categories or numeric values assigned to individuals, objects, or behavior to measure variables. A few presumptions ought to direct the creation of a standard scale. These are validity, reliability, unidimensionality, and linearity.

A valid scale is when it measures what it is supported to measure. The reliability of a scale is when it exhibits the consistency of what it is purported to measure. When all items on a scale point in the same direction, the scale is considered unidimensional. They must not have numerous interpretations and be seen as measuring the same traits. When the scale's response set increases sequentially, there is linearity. In Nigeria, several types of research have been conducted on quality education. Still, to the researcher's best knowledge, none of these studies delved into the development and validation of a scale to measure education quality in secondary school students in Oyo State. Therefore, it is vital to develop a scale to measure the quality of education in Oyo State secondary schools, hence this study.

Objectives of the Study

The main objectives are to:
  i.   determine the factor structures of the scale measuring the quality of education in Oyo State secondary schools;
  ii.   ascertain the validity and reliability of the scale.

Research Questions

To achieve the objectives of this study, three research questions were raised.
  i.   What are the factor structures of the scale measuring the quality of education in Oyo State secondary schools?
  ii.   What is the construct validity and reliability of the scale?

METHODOLOGY

Design

The study used a survey research design focusing on a quantitative method using a survey questionnaire to validate the quality of education components. The population for the study comprised all public and private secondary school teachers in Oyo State. A total of 630 teachers were selected for the survey using a multi-stage sampling technique. Twenty-one secondary schools (i.e., eleven public and ten private schools) were randomly drawn within Ibadan and Oyo town metropolis in Oyo State. In addition, thirty (30) teachers were selected from each school using stratified random sampling techniques using sex, age, rank, discipline, academic qualification, and years of experience for stratification. The selected teachers cut across private and public junior and senior secondary schools within the state.

Instrument

The study's instrument was a self-developed "Quality of Education Questionnaire (QEQ)." The instrument's items were generated from the literature on quality education, and it was designed to elicit information from respondents. The questionnaire formerly had 50 items but was reduced to 30 by the experts to measure the construct items that were supposed to measure. The initial draft of the questionnaire was reviewed by three experts (i.e., Two Professors in Educational Tests, Measurement, and Evaluation; and a Senior Lecturer in the Department of English Language). The two Educational Tests, Measurement and Evaluation experts ensure that all items in the questionnaire do not deviate from the measured construct while also considering face and content validity.

Similarly, an expert from the Department of English Language removed ambiguous items and ensured that all items were free of spelling and grammatical errors. Following the review by all the experts, the QEQ was reduced to 30 items that were utilized to gather information from participants, and a pilot test was conducted to determine the instrument's reliability. To pilot-test the 30 items QEQ, 45 respondents (i.e., 21 male and 24 female teachers) were chosen outside the study area using convenient sampling.

According to Perneger et al. (2015), the sample size for the pre-test stage of scale validation is 30-50 respondents. The teachers were from different secondary schools, with diverse ranks, years of experience, and disciplines. On the other hand, the reliability coefficient of the pilot test questionnaire was 0.75, indicating that the instrument was adequate for obtaining the participants' education quality. Several scholars (Madan & Kensinger, 2017; Sim & Wright, 2005) agreed that a reliability coefficient greater than 0.7 is a suitable and appropriate instrument for gathering respondent information.

Item Scoring

The QEQ was divided into two sections: section A contains demographic characteristics of the participants such; as gender, age, rank, school type, academic qualification, years of experience, and discipline, and section B contains 30 items. The questionnaire items were classified into two groups: positive and negative. Positive items received scores from four to one, while negative items were scored in reverse order. The Likert scale type is Never, rarely, mostly, and always.

Data Collection

The data obtained came from both public and private school teachers. It took three weeks to collect data with the help of two research assistants, and the researchers set aside two days to train them on how to collect data from the participants. The researchers and research assistants visited twenty-one randomly selected schools (eleven public and ten private schools, respectively). A structured questionnaire was distributed to all participants for this study. The researchers got permission from the school authority where the data was collected to ensure high professionalism and ethical standards. The completed questionnaires were immediately collected from the respondents for further analysis.

Data Analysis

The data collected were analyzed in three stages. The first stage was the descriptive analysis, exploring the respondents' demographic details. The second stage was the application of Principal Component Analysis (PCA) and varimax rotation. Factor analysis has been widely used (Gnardellis et al., 2023; Gorsuch, 1990; Hair et al., 2020; Hayes & Coutts, 2020; Knekta et al., 2019; Li, 2016; Sakib et al., 2022; Savitsky et al., 2020; Taherdoost et al., 2014; Yong & Pearce, 2013) in the development and validation of a scale. The third analysis was the reliability estimate using McDonald's reliability, Cronbach's alpha reliability, and confirmatory factor analysis of the scale. The analysis was conducted using Jamovi 2.2.13 software package. Some parameters were adopted to ascertain the model fit statistic, including Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI) above 0.9; Root Mean Square Error of Approximation (RMSEA) and Standardised Root Mean Square Residual (SRMR) less than 0.08 and an insignificant chi-square reveals the appropriate construct validity (Lin et al., 2017; Wu et al., 2017). The Root Mean Square Error of Approximation (RMSEA) is the rule of thumb to adjudge the overall fitness of a model with the threshold value of 0.05 or less as s sign of good model fit. Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) were considered.

RESULTS

A total of 630 respondents participated in this study. Table 1 shows the demographic variables of the sample for the study.

TABLE 1
DEMOGRAPHIC VARIABLES OF THE RESPONDENTS

Demographic Variables		Frequency	Percentage
Sex	Male	280	44.44 %
	Female	350	55.56 %
	Total	630	100%
Age	20-29 Years	153	24.29 %
	30-39 Years	209	33.17 %
	40-49 Years	150	23.81 %
	50-59 Years	118	18.73 %
	Total	630	100%
Rank	Principal	92	14.60 %
	Vice-Principal	100	15.87%
	Head of Department	118	18.73 %
	Teacher	320	50.79 %
	Total	630	100%
School Type	Public Schools	330	52.38 %
	Private Schools	300	47.62 %
	Total	630	100%
Academic Qualification	NCE	113	17.94 %
	B.Ed./BSc.	284	45.08 %
	PGD	99	15.71 %
	Master's	67	10.63 %
	Ph.D.	67	10.63 %
	Total	630	100%
Years of Experience	0 – 10 Years	236	37.46 %
	11 – 20 Years	174	27.62 %
	21 – 30 Years	124	19.68 %
	31 – 40 Years	96	15.24 %
	Total	630	100%
Discipline	Science	187	29.68%
	Social Science	144	22.86%
	Art	168	26.67%
	Vocational	131	20.79%
	Total	630	100%

Table 1 shows the demographic variables of the respondents. It showed that most % of the participants were female teachers, with 55.56 %, while 44.44 % were male teachers. The age of the participants revealed that 24.29 %, 33.17%, 23.81%, and 18.73% are teachers between the age of 20-29 years, 30-39 years, 40-49 years, and 50-59 years, respectively. The highest proportion of the participants is just ordinal classroom or subject teachers, with 50.79%, while those in the rank of Principal, Vice-Principal, and Head of Department are 14.60%, 15.87%, and 18.73%, respectively. Furthermore, Table 1 revealed that most participants were public school teachers, accounting for 52.38 %, whereas 47.62 % represented private school teachers.

One of the respondents' academic qualifications showed that most teachers had B.Ed./B.Sc. certificate, whereas others have acquired various qualifications ranging from NCE, PGD, Master, and Ph.D.

The years of experience of the respondents showed that 37.46%, 27.62%, 19.68%, and 15.24% are teachers who had spent up to 10 years, 11-20 years, 21-30 years, and 31-40 years, respectively, in the

service as a teacher. A large proportion of the participants are teachers who teach science subjects, with 29.68%, while 22.86%, 26.67%, and 20.79% teach Social Science, Art, and Vocational subjects, respectively.

Research Question 1: *What are the factor structures of quality education in Oyo State secondary schools?*

To address this question, the QEQ was deployed to obtain information from the participants. In determining the factor structures, the QEQ was exposed to Horn's (1965) parallel analysis to determine the number of factors embedded in the scale. In the literature (Cota et al., 1993; Dinno, 2009; Glorfeld, 1995; Hayton et al., 2004; Jackson, 1993; Lance et al., 2006; Montanelli & Humphreys, 1976; Silverstein, 1977; Velicer et al., 2000; Zwick & Velicer, 1986), a convincing argument have been presented to support parallel analysis as one of the most reliable ways of determining the factor structure of any given scale. The desire to retain any item in a factor is vital because different methods are more or less likely to overestimate or underestimate the number of factors or components.

Consequently, three items (i.e., items 3, 8, and 16) were affected by parallel analysis, and the result is presented in Table 2. Items 3, 8, and 16 states, "I make use of instructional materials to enhance my teaching," "Teachers are well paid and regularly," and "Students participate actively in sporting activities," respectively.

TABLE 2
PRINCIPAL COMPONENT ANALYSIS OF QEQ

Items	Factor loadings	Component Mean (SD)	Eigenvalue	% of variances	Cronbach's Alpha (α)	Omega (ω)
School Facilities and Management		**2.63 (0.61)**	**5.55**	**39.33**	**0.78**	**0.79**
Item 11	0.70	2.71 (0.92)				
Item 24	0.68	2.57 (1.04)				
Item 25	0.64	2.55 (0.96)				
Item 26	0.63	2.17 (1.07)				
Item 21	0.61	3.01 (1.04)				
Item 20	0.61	2.76 (0.92)				
Item 30	0.58	3.19 (0.87)				
Item 7	0.57	1.93 (1.04)				
Item 23	0.57	2.87 (0.93)				
Item 22	0.54	2.48 (1.09)				
Item 18	0.53	2.47 (0.99)				
Item 6	0.53	2.17 (1.06)				
Item 5	0.51	3.23 (0.90)				
Item 27	0.42	2.77 (0.87)				

Items	Factor loadings	Component Mean (SD)	Eigenvalue	% of variances	Cronbach's Alpha (α)	Omega (ω)
Students'/Staff Development		**3.34 (0.51)**	**2.97**	**42.45**	**0.71**	**0.74**
Item 10	0.68	3.13 (0.95)				
Item 13	0.67	3.48 (0.83)				
Item 4	0.64	3.46 (0.69)				
Item 2	0.62	3.58 (0.64)				
Item 9	0.58	3.10 (0.82)				
Item 12	0.54	3.15 (0.83)				
Item 14	0.49	3.47 (0.70)				
School Policy and Students' Engagement		**3.05 (0.57)**	**2.51**	**41.87**	**0.72**	**0.72**
Item 28	0.66	2.83 (1.03)				
Item 17	0.66	2.91 (0.83)				
Item 1	0.5	3.42 (0.77)				
Item 15	0.44	2.90 (0.82)				
Item 29	0.44	3.26 (0.91)				
Item 19	0.43	2.99 (0.91)				

Note. 'varimax' rotation was used.

Table 2 presents the PCA based on a parallel analysis of the QEQ. The PCA with the Varimax rotation method of factors was conducted to determine the underlying construct from the 27 items used to measure QEQ. All the commonalities of the items were more than 0.4, indicating that the item-total correlation is significant. Only three items (i.e., items 5, 8, and 16) were obliterated based on the parallel analysis. In addition, Table 2 demonstrates school facilities and management are the first factor of quality education. It explained 39.33% of the variance and eigenvalue of 5.55. The reliability estimate of the factor was α = 0.78 and ω = 0.79. In addition, school facilities and management loaded fourteen items indicating the highest number of items (i.e., items 11, 24, 25, 26, 21, 20, 30, 7, 23, 22, 18, 6, 5, and 27) factor loading. It was further noticed that item 5 had the highest mean, implying that teachers consider the class well-ventilated and illuminated teaching and learning as a channel to access quality education.

On the other hand, item 7 (i.e., internet facilities are available in the school for teachers.) was observed to have the least mean among school facilities and management. Students and staff development were identified as the second factor, which attracted seven items, including items 10, 13, 4, 2, 9, 12, and 14, with an eigenvalue of 2.97 and 42.45% as the total variance. The "α" and "ω" are 0.71 and 0.74, respectively. Also, item 2 with the statement "I am friendly with my students" had the highest mean value, indicating that the significant role played by students'/staff development in ensuring the quality of education can never be overemphasized. On the other hand, item 9 (i.e., the discipline of teachers is not arbitrary but follows due process and is guided by teachers' code of conduct) exhibited the least mean, implying that most schools are not provided with internet facilities.

Factor 3, named "school policy and students' engagement," loaded six items (i.e., items 28, 17, 1, 15, 29, and 19) with an eigenvalue of 2.51, total variance of 41.87%, Cronbach alpha, and McDonald Omega reliabilities of 0.72, and 0.72 respectively. It further demonstrated that item 1 revealed the highest mean value, implying that teachers' revision of lesson notes before class is essential in advancing the course of quality education. Item 28 had the smallest mean. However, all three factors are further presented in Figure 1.
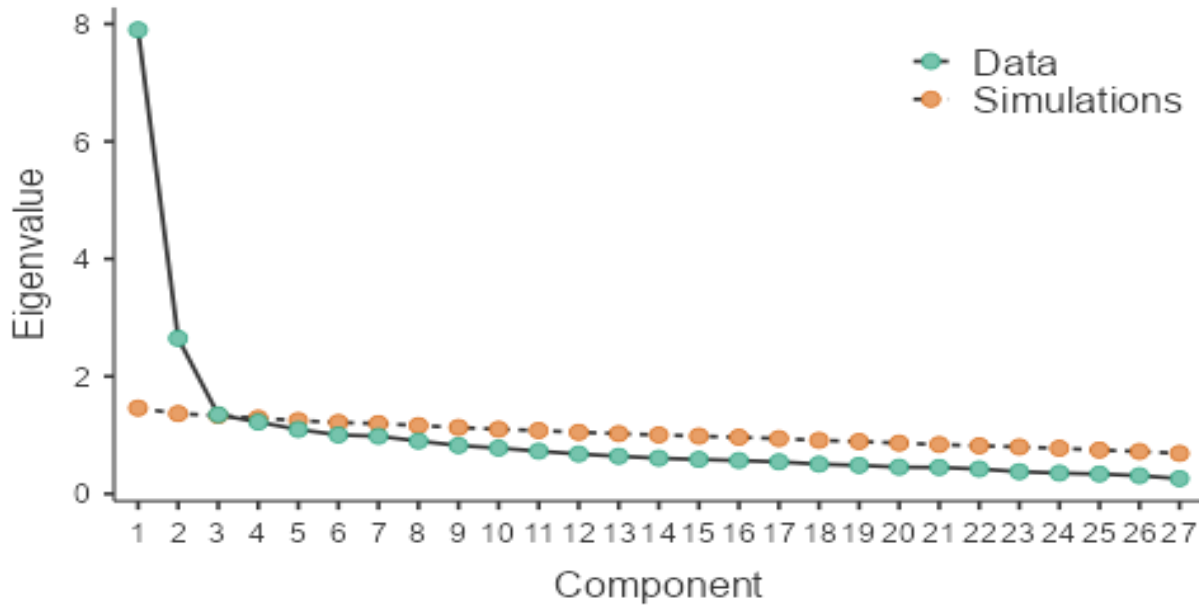
FIGURE 1
SCREE PLOT OF QEQ

Figure 1 revealed the scree plot of the QEQ. The scree plot also shows the relationship between the eigenvalue and the final 27 items of the QEQ. It was observed that three factors were captured below the elbow of the eigenvalue, which further supported the PCA.

Research Question 2: *What is the construct validity of the scale?*

Principal Component Analysis (PCA)

The PCA was applied to ascertain the construct validation of the scale. Literature has shown that researchers (Chowdhary et al., 2020; Omoyemiju & Popoola, 2020; Opesemowo et al., 2018; Opesemowo et al., 2022) often use PCA in grouping items into a different construct of quality education. Subsequently, to sustain the data for the factor analysis, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and the Barlett Test of Sphericity (BTS) were used to detect the statistical appropriateness of the scale. It was discovered that KMO (0.90) and BTS (6054.23) coefficients were significant ($\chi^2 = 6054.23$, df = 351, p < 0.01), indicating that items were suitable for factor analysis. Three (3) factors emerged from the initial eigenvalues, accounting for 65.8% of the total scale variance on the QEQ.

Confirmatory Factor Analysis

TABLE 3
FACTOR ESTIMATES OF MODEL FIT STATISTICS

Models	χ^2	df	p	CFI	TLI	SRMR	RMSEA	AIC	BIC
Factor 1	458.30	77	0.001	0.89	0.84	0.05	0.05	22156.18	22342.90
Factor 2	112.78	14	0.001	0.89	0.84	0.05	0.01	9411.18	9504.54
Factor 3	32.92	9	0.001	0.96	0.93	0.03	0.06	9170.96	9250.98

Table 3 displays the model fit statistic of the underlying factors from the QEQ. The nested model in Table 4 revealed that when the fitness of Factor 3 model compared to Factor 2 and Factor 1 fit better with

$\chi^2_{(9)}$ = 32.92, $p<0.05$, CFI = 0.96, TLI = 0.93, RMSEA = 0.06, and SRMR = 0.03, AIC = 9170.96, BIC = 9250.98. While Factors 2 and 1 presented the same model fit statistic with $\chi^2_{(14)}$ = 112.78, $p<0.05$, CFI = 0.89, TLI = 0.84, RMSEA = 0.11, and SRMR = 0.05, AIC = 9411.18, BIC = 9504.54, and $\chi^2_{(77)}$ = 32.92, $p<0.05$, CFI = 0.89, TLI = 0.84, RMSEA = 0.09, SRMR = 0.05, AIC = 22156.18, BIC = 22342.90 respectively.

TABLE 4
MODEL FIT STATISTIC OF QEQ

χ^2	df	p	CFI	TLI	RMSEA	SRMR	AIC	BIC
1774.91	347	0 .001	0.96	0.94	0.08	0.07	41459.37	41846.15

Table 4 demonstrates the model fit statistic of the 27-item QEQ. It revealed the model fit statistic with $\chi^2_{(14)}$ = 1774.91, $p<0.05$, CFI = 0.95, TLI = 0.94, RMSEA = 0.08, and SRMR = 0.07, AIC = 41459.37, BIC = 41846.15. This means that the QEQ had an acceptable model fit.

Research Question 3: *What is the reliability of the scale?*

To determine the extent of the scale reliability, a new trend of computing reliability (McDonald Omega) and the usual form of reliability (i.e., Cronbach alpha) was conducted for the study. Table 3 shows the reliability of the scale.

TABLE 5
QEQ RELIABILITY STATISTICS

Scale Items	Mean	Standard deviation	Cronbach's α	McDonald's ω
N = 27	2.91	0.49	0.78	0.79
N = 30	2.93	0.48	0.71	0.74
Factor 1	2.63	0.61	0.77	0.78
Factor 2	3.34	0.51	0.75	0.77
Factor 3	3.05	0.57	0.72	0.72

Table 3 revealed the QEQ reliability estimate using Cronbach's α and McDonald's ω reliability. Both the initial 30-item QEQ and the new 27-item subscale factors (i.e., Factors 1, 2, and 3). QEQ have demonstrated that the scales were reliable since their estimates which stood at α = 0.71, ω = 0.74, and α = 0.78, ω = 0.79, were above 0.7, which is a rule of thumb for a scale to be reliable. Table 5 also presents the reliability of the three-factor subscales. It showed that Factors 1, 2, and 3 indicated α = 0.77, ω = 0.78, α = 0.75, ω = 0.77, and α = 0.72, ω = 0.72 respectively. This means that the subscale factor estimates are reliable.

FIGURE 2
CORRELATION HEATMAP OF THE QEQ

Figure 2 presents the correlation heatmap of the QEQ to establish the relationship between items. Each square reveals the correlation between the variables on each axis. The correlation ranges from -1, which is extremely red, to +1, which is extremely green. The diagonal is all 1/dark green because those squares represent the relationship between each variable, which is a perfect correlation. Also, the pilot is symmetrical about the diagonal since the same two variables are paired together in that square. It was concluded that a positive correlation in all items was established in the correlation heatmap because all squares are shaded green.

DISCUSSION

This paper contributes to the existing literature by developing and validating a scale to measure the quality of education. The items were generated from the literature and subjected to qualitative moderation and expert (Educational Tests, Measurement, Assessment, and Evaluation) reviews which resulted in the deletion of items. After expert scrutiny, the QEQ was deployed to obtain information from the participants. In addition, the pilot study was also conducted, and QEQ was exposed to Horn's (1965) parallel analysis to ascertain the items that adequately measure the construct. The PCA based on parallel analysis with the varimax rotation method of factors was initiated to determine the underlying construct. Based on the analysis from the 30-item QEQ, 27 items adequately measured the education quality. All the commonalities

of the items were more than 0.4, indicating that the item-total correlation is significant. Only three items were eliminated because they could not satisfy the parallel analysis criteria.

Furthermore, it was discovered that teachers regard school facilities and management as critical to teaching and learning to obtain a quality education. Students/staff development was identified to have the highest mean, which implies that teachers believed that students'/staff development is vital to enhance teaching and learning. The significant role played by students'/staff development in ensuring quality education can never be overemphasized.

The reliability of the QEQ was analyzed using a new trend of computing reliability (McDonald Omega), and the usual form of reliability (i.e., Cronbach alpha) was conducted for the study. The Cronbach alpha and McDonald's omega were analyzed to determine if the items in the instruments measure what they are intended to measure. Recently, researchers (Chowdhary et al., 2020; Hayes & Coutts, 2020) have cautioned that Cronbach alpha is not a perfect measure of reliability; instead, McDonald omega reliability was said to have been recommended. The essence of examining both the McDonald's omega and Cronbach's alpha of the scale was to be double sure about the instrument's reliability (QEQ) since the scale will be recommended for use by stakeholders. Both the initial 30-item QEQ and the recent 27-item QEQ demonstrated that the scales were reliable since their estimates which stood at $\alpha = 0.71$, $\omega = 0.74$, and $\alpha = 0.78$, $\omega = 0.79$, were above 0.7 which is a rule of thumb for a scale to be reliable.

CONCLUSION

The study concluded that the scale was reliable and valid for measuring quality education in Oyo State secondary schools. However, school facilities and management were found to have played a substantial role in quality education. Therefore, education stakeholders can consider adopting or adapting the scale in measuring quality education in Oyo State secondary schools.

RECOMMENDATION

Based on the study's finding, it was demonstrated that the instrument possessed appropriate psychometric properties and was capable of measuring the quality of education in Oyo State secondary schools. It was then recommended that the scale results are preliminary and that more research can be conducted to establish a higher reliability and validity of the scale before it is recommended for widespread use to measure the quality of education in secondary schools.

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APPENDIX

FINAL SCALE
QUALITY OF EDUCATION IN SECONDARY SCHOOLS IN OYO STATE (QEQ)

Dear Respondent,

This instrument is designed to measure the quality of education in secondary schools. Please, respond to
every item by ticking ( ) one of the options in front of the items as they apply to you. Your responses will
be treated with utmost confidentiality.
Thank you.

SECTION A: DEMOGRAPHICAL INFORMATION

Sex: Male (   ) Female (   )
Age: ----------------------------
Rank: Principal ( ) Vice-Principal (   )   Head of Department (   ) Teacher (   )
School Type: Public ( )   Private ( )
Academic Qualification: NCE (   ) B.Ed/BSc. (   ) PGD (   ) Master's (   ) Ph.D. ( )
Years of Experience: 0 - 10 years (   ) 11 – 20 years (   ) 21 – 30 years (   ) 31 - 40 years ( )
Discipline: Science (   )   Social Science ( ) Art ( ) Vocational (   )
N = Never; R = Rarely; M = Mostly; A = Always

Old	New	CLASSROOM	N	R	M	A
Factor 1		**School Facilities and Management**				
11	1	Teachers are provided with necessary tools and resources for teaching				
24	2	The school has regular supply of water and electricity without fail.				
25	3	There are well equipped laboratories for science practicals.				
26	4	The school has a computer laboratory with adequate and functional computers for students.				
21	5	The school provides for sanitation and toilets for the needs of male and female students.				
20	6	The school has adequate learning resources which are effectively used.				
30	7	The general climate of the school is welcoming and conducive to teaching and learning.				
7	8	Internet facilities are available in the school for teachers.				
23	9	The school provides for adequate security of staff and students.				
22	10	The facilities in the school take cognisance of students with special needs.				
18	11	Teachers make use of technology to enhance teaching and learning.				
6	12	Teachers have access to computers in the school.				
5	13	My class is well ventilated and illuminated.				
27	14	The school has a robust assessment policy and practice.				

Factor 2		Students'/Staff Development				
10	15	Teachers are encouraged to undertake higher degrees to enhance their competence.				
13	16	I educate my students on the dangers of keeping bad companies.				
4	17	Students and teachers interact actively in the class.				
2	18	I am friendly with my students.				
9	19	The discipline of teachers is not arbitrary but follow due process and guided by teachers' code of conduct.				
12	20	I enable my students to develop a personal study timetable.				
14	21	The school environment is regularly kept neat and clean.				
Factor 3		School Policy and Students' Engagement				
28	22	The school Counsellor is always available and accessible to students.				
17	23	Our students excel in inter-school academic competitions.				
1	24	I revise my lesson notes before going to class.				
15	25	Students' academic performance is generally high in my school.				
29	26	The school does not tolerate any iota of examination malpractices				
19	27	Students are encouraged to play leading roles during school activities such as school assembly.				