Instrument Development for Measuring Teacher Quality: A Content Validity Study (CVS)

[1]**Saleman Mashood Warrah, PhD,** Department of Educational Management & Leadership, Kwara State University, Malete, Nigeria
salemanmwarrah@gmail.com

[2]**Zahratun Nufus**, STAI Rasyidiyah Khalidiya Amuntai, Indonesia.

[3]**Siti Hamira Binti Md Ngajib,** Faculty of Education and Social Sciences, Universiti Selangor, Malaysia

[4]**Onesmus Shimanya**
Mweshipandeka Secondary School, Namibia

[5]**Adebayo, Sherifat Shola PhD,** Department of Educational Management & Leadership, Kwara State University, Malete, Nigeria

[6]**Aloba, Fatimah Musa, PhD,** Kwara State Universal Basic Education

[7]**Ameen Saliman Abdullahi**, Kwara State Universal Basic Education

Abstract

*Teacher quality is one of the factors that determine students' academic performance in secondary schools. The key objective of this study was to examined the validity and reliability of teacher quality instrument. The teacher quality questionnaire instruments was subjected to validity and reliability test. The research design was quantitative study using a total of six panels with vast knowledge in the area of educational management to validate, examine correctness and uniformity of the questionnaire if the instruments can be used for further analysis. Also, 100 teachers were selected from three senatorial district of Kwara state using the simple random technique to answer questionnaire prepared for reliability of the instrument. The findings revealed that I-CVI of 0.63 to 1.00, S-CVI 0.68 to 1.00 and KSCI of 0.68 to 1.00 instrument met require value of content validity. Likewise, the finding further shown that the reliability values for the teacher quality instruments were greater than 0.6. Thus, the teacher quality instrument was reliable to measure teacher quality from the teacher's perceptions in the context of Kwara State Public Secondary Schools. In line with results, the study suggested that statistical tools like CFA and EFA should be used for teacher quality instrument by future researchers for valid*ation so as to establish that the teacher quality instruments have higher standard.

Keywords: Teacher quality, Content validity index, Validity, Reliability

Introduction

Teacher quality has been one of the contentious issues to government and stakeholders in education. Teaching and learning depend on quality of teachers employed into teaching

profession (Arinde, 2010; Adedoyin, 2011; Hanushek & Rivkin, 2006; Harris & Rutledge, 2007; Harris & Sass, 2011; Ogunyinka et al., 2015; Canbolat, 2025). Teaching as profession is quite different from other profession because it builds good character into students' mind. This is the reason why teacher needed in the school must have adequate knowledge of teaching profession. Also, teachers employed into the system are expected to possess teaching commitment, content knowledge, communication skills as well as classroom management skills (Ajeyalemi, 2013; Cavalluzzo, 2004; Goldhaber & Anthony, 2005; Goddard, 2000; Rice, 2003;). Teachers who display skills in the classroom is consider as a quality teacher (Abd Hamid, et al., 2012; Ekmekci & Serrano, 2022). In line with this explanation, adequate attention must be devoted to teacher quality (Bell, 2002; Cohen & Hill, 1998; Darling-Hammond, 2017; Wenglinsky, 2002; Kawuryan et al. 2021). Moreover, the notion of teacher quality in education system must be investigated so as to discover which other quality teachers needed. There are numerous teacher qualities suggested by researchers of teachers' quality. Teachers are expected to have certain qualities in order to be considered relevant in the classroom. Teachers are expected to have requisite skills needed in the teaching profession (Goe, 2007; Harris & Rutledge, 2007; Lin et al., 2010; Kemethoferet al., 2025). For this reason, teachers to be employed into teaching must be quality oriented.

Therefore, it is a matter of great concern to use a valid assessment instrument of teacher quality that would have adequate content validity support. It is fundamental to make use measurement instruments which have comprehensive scales agreed-upon by panels in the field of educational management. In most of the literature reviewed on teacher quality, none has ever subjected teachers' quality instruments to extensive content validation as it is done in this study. This serve as a gap to be filled in this study. Then, in the course of acquire data in this exercise, the questionnaire is constructed and developed. The content validity of the instrument is the one that would show true picture of the situation whether the study can be continued or stop. Based on this, the researchers conducted this preliminary study to get information on the validity of teacher quality instrument in the context of Kwara State Public Secondary Schools. Based on this contributions, these following research purposes and questions were offered.

Research Objectives

1. To determine the total CV of the teacher quality instruments
2. To investigate the CV of individual item and teacher quality dimensions instruments.
3. To examine teacher quality instruments reliability.

Research Questions

1. What is the total CV of the teacher quality instrument?
2. What is the CV of individual item and teacher quality dimensions instrument?
3. What is the teacher quality instrument reliability?

Concept of Teacher Quality

Teacher quality is the process by which teachers engage in educational functions, possessing specific qualities and being qualified to conduct teaching activities, put students' interest in learning (Lin et al. 2010; Ray & Ghosh, 2014; Dabholkar, 2015; Canbolat, 2025). Teacher quality also refer to as the combination of factors like knowledge, personal attributes, qualification and knowledge that make teacher more efficiency in improving students learning and fostering of classroom situation (Arinde, 2010; Harris & Sass, 2011; Harris & Rutledge,

2007; Hanushek & Rivkin, 2006; Ibrahim, 2015; Peng & Ilinitch, 1998; Charalambous, et al., 2025). This is integrate what teachers know and the way they teach as well as capability to create relationship with the learners (Wu (2003). Teacher quality is one of the factors that determine students' success in the school. A growing body of research have found that students' academic success are determine by the quality of the teachers (Goe, 2007, Hanushek & Rivkin, 2006, Harris & Rutledge, 2007; Harris & Sass, 2011; Darling-Hammond, 2017; Charalambous, et al., 2025). If the goals of education are to be accomplished in schools, teacher quality must be taken into account. This is due to the fact that the caliber of teachers who are engaged in the teaching profession determine the quality of students to be produce.

Additionally, quality education depends on the quality of teachers employed in the school (Ololube, 2005; Oakland, 2014; Morgan, 2015; Gutierrez-Gutierrez et al., 2018; Ekmekci, et al., 2022). Some of the aspect that led to quality education are method of teaching, evaluation of curriculum, the contents, evaluation plans and practice. The teaching activities in the classroom is center on students and the mechanism to the success of teaching is teachers (Ololube, 2005; Goetsch & Davis, 2014; Calabrese & Corbo, 2015; Kemethofer, et al., 2025). It is necessary to have deep knowledge of teacher quality so as to enhance quality teaching in the school (Hanushek & Rivkin, 2006; Ibrahim, Arshad, & Salleh, 2017; Praetorius, et al., 2025). More so, teacher who possess teaching quality perform excellent job and impact quality knowledge on students. Figure 1 of this study showed the dimensions of teacher quality.

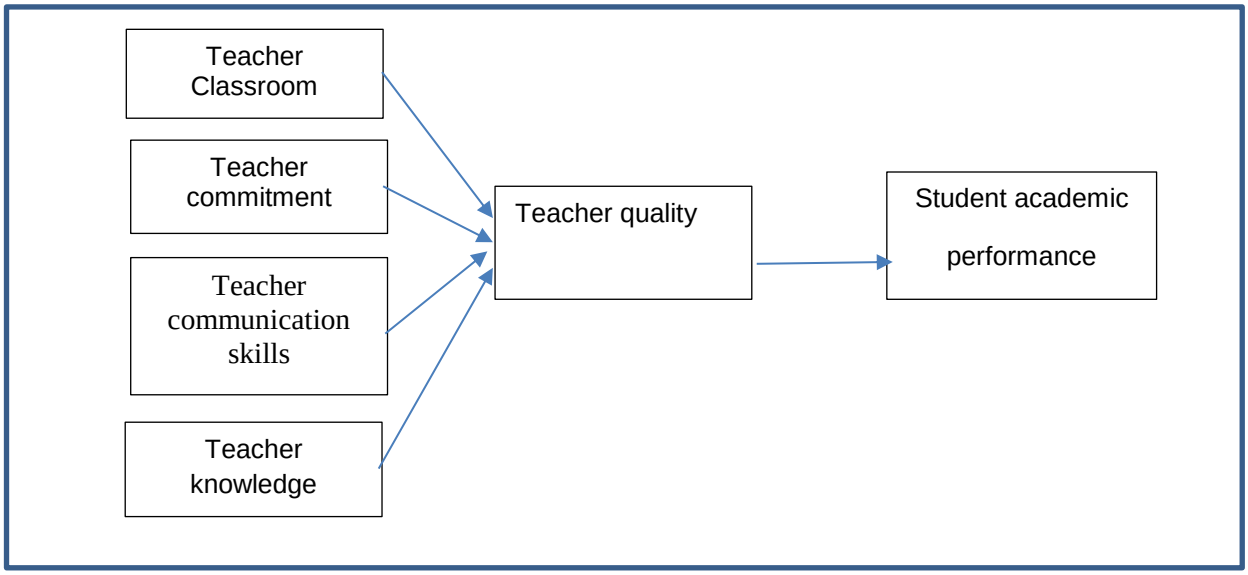

Figure 1: The Conceptual Framework *Source:* developed by researcher

Teacher Quality Theoretical Framework

In this study, there were five theories formulated and such theories helped the researcher to arrive at conceptual model in Figure 1. In fact, these relevant theories assist researcher in the comprehension of the relationship between teacher quality and students' academic performance. It is the theories borrowed made this conceptual model possible. The models developed by researchers such as Goe (2007); Ibrahim et al. (2017) and Elassy (2015) were used in this study to have in-depth understanding of teacher quality. The model suggests that

teachers should possess requisite qualities in order to teach in the classroom. It is quality of teacher that determine the quality of the student to be produce for a nation. Shulman (1986) developed theory of knowledge which help the researcher to understand teacher knowledge. Shulman (1986) pointed that teacher knowledge in the school is the predictor of students' academic performance.

Similarly, the theory of Mortimer and Scott (2002); Silverman, Kurtz, and Draper (2016) also used to understand teacher communication skills. The theory suggested that the use of effective communication skills by teachers can enhance teaching quality in the classroom. Also, Meyer and Allen (1991) proposed theory of commitment help development of conceptual framework. The theory articulated that commitment of teacher's to teaching profession can lead to effective teaching in the class which in turn lead to improve in students' academic performance. Lastly, Wolgang and Glickman (1980) formulated theory of classroom management on how teacher can use such technique to enhance teaching quality.

Methodology

This research adopted quantitative research to elicit information from respondents. Therefore, quantitative research is the testing, development of hypotheses and building of the theories that explain the interaction (Silverman, 2016). Purposive random sampling technique was employed to select two panels each from University of Ilorin, Kwara State University, Malete and Al-Hikmah university making a total of six panels who validated the instrument (Souza et al., 2017). The panel had vast experience in the area of educational management. More so, testing instrument reliability, 100 teachers were chosen across three senatorial districts in Kwara state using simple random sampling technique with three secondary schools in each senatorial districts making total of nine schools used for the exercise. There were three research instruments used in the study. They were: teachers classroom management; teachers' commitment; teachers communication skills and teachers' knowledge skills. Therefore, all items were based on 5-point Likert scale ranging from strongly agree to strongly disagree.

Summary of Teacher Quality Dimensions and Rule of Thumbs

The main purpose of content validity is to make sure that the instrument measure what it supposed to measure. Based on this, Souza et al. (2017) pointed that the value of CV is the technique introduced to validate the content of the instrument. The CVI that is equal to 0.78 or higher is suitable for three experts which considered as highest content validity. More so, when CVI is 0.67 is consider as very fair and CVI of 0.90 is regarded as perfect content validity. Therefore, in this study, kappa statistics coefficient index was used to investigate the degree of value of kappa coefficient for teacher quality instrument (Souza et al., 2017). Table 1 shown summary of teacher quality and Table 2 shown rule of thumbs to determine Kappa result.

Table 1

Summary of Teacher Quality

Dimensions	items	Description
Teachers Classroom Management	1-10	Management of material resources in the classroom to attained educational objectives
Teachers Commitment	11-20	Commitment of teachers in discharging the educational goals
Teachers Communication Skills	21-30	Communication skills possessed by the teacher could make him effective in the teaching professions
Teachers' knowledge skills	31-40	Teacher knowledge of the subject

Table 2

Rule of Thumbs for Kappa Result

Value kappa	Level of agreement	% of data that are reliable
0	No agreement	0-4%
0.01-0.20	Slight	4-15%
0.21-40	Fair	15-35%
0.41-0.60	Moderate	35-63%
0.61-0.80	Substantial	64-81%
0.81-1.00	Almost perfect	82-100%

Findings of the Study

There were three research questions tested in the study. Namely; what is the total CV of the teacher quality instrument; what is the CV for individual item and teacher quality dimensions and what is the teacher quality instrument reliability. The results were stated in Table 3

Research Question One: What is the total Content Validity of the Teacher Quality Instrument (TQI)?

Table 3

Content Validity of teacher quality

Panel	Panel 1	Panel 2	Panel 3	Panel 4	Panel 5	Panel 6	Cumulative
Panel Agreement	39/40	34/40	39/40	40/40	34/40	40/40	226/240
Panel conclusion (%)	97%	85%	97%	100%	85%	100%	94%

As stated in Table 3 of this study on panel conclusion who verified and assessed the teacher quality instrument. A total of two panels agreed on 100%, two panels agreed on 97%, two panels also agreed on 85%. Based on this analysis, the six panels agreed on 94% with TQI developed for this study. According to Miller (2012) asserted that instrument with 80% is regarded as satisfactory content validity. With this, TQI has met require value and it can be used for further analysis. Also, kappa statistics was achievable for the dimensions items which were in the range of 0.80 to 1.00 for the six panels used.

Research Question Two: What is the Content Validity (CV) of individual item and dimensions Measuring TQ Instrument?

Table 4

Rating of Item level Content Validity Index (I-CVI) of Teacher Classroom Management

items	panel1	panel 2	Panel 3	Panel 4	Panel 5	Panel 6	Agreement no	I-CVI	PC	KS	Result
I	+	+	+	+	+	+	6	1.00	.016	1.00	Satisfactory
2	+	+	+	+	+	+	6	1.00	.016	1.00	Satisfactory
3	+	+	+	+	+	+	6	1.00	.016	1.00	Satisfactory
4	-	+	+	+	+	+	5	0.83	.094	0.81	Satisfactory
5	+	+	+	+	+	+	6	1.00	.016	1.00	Satisfactory
6	+	+	+	+	+	+	6	1.00	.016	1.00	Satisfactory
7	-	+	+	+	+	+	5	1.00	.016	1.00	Satisfactory
8	-	+	+	+	+	+	5	0.83	.094	0.81	Satisfactory
9	-	+	+	+	+	+	5	1.00	.016	1.00	Satisfactory
10	-	+	+	+	+	+	5	1.00	.016	1.00	Satisfactory

S-CVI/Ave = 0.932 (accepted); I-CVI = item content validity index; S-CVI = scale content validity index; PC = Probability of chance agreement.

As shown in table 4 on analysis of I-CVI value, the ten items for teachers' classroom management were attainable because values were between 0.63-1.00. With this result, the items in the TCM met the satisfactory value (Polit & Beck, 2006; Polit et al., 2007). Then, the S-CVI/AVE values for TCM were at 0.966. Thus, all items in the TCM instrument had satisfactory content validity and was acceptable in this current study. Thus, further analysis can be performed on the instrument.

Table 5

Rating Items level Content Validity Index (I-CVI) of Teacher Commitment

items	Panel 1	Panel 2	Panel 3	panel4	Panel 5	Panel 6	Agreement no	I-CVI	PC	KS	Result
11	+	+	+	+	-	+	5	0.83	.094	0.81	Satisfactory

12	+	+	+	+	+	+	6	1.00	.016	1.00	Satisfactory
13	+	+	+	+	+	+	6	1.00	.016	1.00	Satisfactory
14	+	-	+	+	+	+	5	0.83	.094	0.81	Satisfactory
15	+	+	+	+	+	+	6	1.00	.016	1.00	Satisfactory
16	+	-	+	+	+	+	5	0.83	.094	0.81	Satisfactory
17	+	+	+	+	+	+	6	1.00	.016	1.00	Satisfactory
18	+	-	+	+	+	+	5	0.83	.094	0.81	Satisfactory
19	+	+	+	+	+	+	6	1.00	.016	1.00	Satisfactory
20	+	+	+	+	+	+	6	1.00	.016	1.00	Satisfactory

The result for items level content validity index (I-CVI) of teacher commitment was reported in Table 5. The result demonstrated that I-CVI values were met for the 11 to 20 for TC which were in the range of 0.63 to 1.00. All the items for TC had acceptable and satisfactory. Also, the S-CVI/AVE for TC were at 0.932 respectively. Thus, the items in TC had satisfactory content validity and acceptable for this study (Polit & Beck, 2006; Polit et al., 2007).

Table 6

Rating item level content validity index (I-CVI) of Teacher Communication Skills

items	**Panel 1**	**Panel 2**	**Panel 3**	**Panel 4**	**Panel 5**	**Panel 6**	**Agreement no**	**I-CVI**	**PC**	**KS**	**Result**
21	+	+	+	+	+	+	6	1.00	.016	1.00	Satisfactory
22	+	-	+	+	+	+	5	0.83	.094	0.81	Satisfactory
23	+	+	+	+	+	+	6	1.00	.016	1.00	Satisfactory
24	+	+	+	+	+	+	6	1.00	.016	1.00	Satisfactory
25	+	-	+	+	+	+	5	0.83	.094	0.81	Satisfactory
26	-	+	+	+	+	+	5	0.83	.094	0.81	Satisfactory
27	+	+	+	+	+	+	6	1.00	.016	1.00	Satisfactory

28	+	+	+	+	-	+	5	0.83	.094	0.81	Satisfactory
29	-	+	+	+	-	+	5	0.83	.094	0.81	Satisfactory
30	+	-	+	+	+	+	5	0.75	.094	0.63	Satisfactory

The result for I-CVI on teacher communication skills was shown in Table 6. The results demonstrated that I-CVI values were achievable for items from 21 to 30 items. This result shown that teacher communication skills met the require values as recommended by Polit & Beck (2006). Then, the S-CVI/AVE values for Teacher Communication Skills were at 0.932. Thus, items for Teacher Communication Skills had satisfactory content validity as well acceptable in this current study

Table 7

Rating item level content validity index (I-CVI) of Teacher knowledge

items	**Panel 1**	**Panel 2**	**Panel 3**	**Panel 4**	**Panel 5**	**Panel 6**	**Agreement no**	**I-CVI**	**PC**	**KS**	**Result**
31	+	+	+	+	+	+	6	1.00	.016	1.00	Satisfactory
32	+	+	-	+	+	+	5	0.83	.094	0.81	Satisfactory
33	+	+	+	+	+	+	6	1.00	.016	1.00	Satisfactory
34	-	+	+	+	+	+	5	0.83	.094	0.81	Satisfactory
35	+	+	+	+	+	+	6	1.00	.016	1.00	Satisfactory
36	+	+	+	+	+	+	6	1.00	.016	1.00	Satisfactory
37	-	+	+	+	+	+	5	0.83	.094	0.81	Satisfactory
38	+	+	+	+	-	+	5	0.83	.094	0.81	Satisfactory
39	+	+	+	+	-	+	5	0.83	.094	0.81	Satisfactory
40	+	+	+	+	+	+	6	1.00	.016	1.00	Satisfactory

The result for I-CVI on teacher knowledge was shown in Table 7. Based on this analysis, the results pointed that CVI values were achievable for items 31 to 40 for teacher knowledge. The CVI of the items in the teacher knowledge were within the range of 0.63 to 1.00. Thus, all items had satisfactory cut-of mark and satisfactory in this study (Polit et al., 2007). Also, the S-

CVI/AVE values for teacher knowledge were at 0.915. With this, the items in teacher knowledge had good content validity as well as suitable in this study.

Research Question Three: What is the Teacher Quality Instruments Reliability?

Table 8

Reliability Analysis

Scale/Item	Corrected item-Total Correlation	Cronbach's Alpha if item deleted	Cronbach's Alpha	Items No
Teacher Knowledge				
TK1	.081	.633		
TK2	.292	.582	0.701	
TK3	.444	.584		
TK4	.417	.582		
Communication Skills				
CS5	.291	.592		
CS6	.319	.592	0.607	
CS7	.262	.588		
CS8	.240	.600		18
CS9	.381	.563		
Teacher Commitment				
TC11	.284	.587		
TC12	.306	.606		
TC13	.425	.590	0.876	
TC14	.319	.606		
TC15	.393	.606		
Classroom Management				
CM17	.227	.603		
CM19	.186	.605	0.818	
CM20	.419	.593		
CM21	.221	.624		
CM22	.224	.601		

Table 8 shown the result of reliability for teacher quality dimensions which comprises teacher knowledge, communication skills, teacher commitment and classroom management. The reliability results revealed that teacher knowledge had Cronbach alpha of .701, communication skills .607, teacher commitment .876 and classroom management .818 respectively. Therefore, the items of the dimensions measuring teacher quality met the acceptable value as recommended by hair et al, (2010). The results further indicated that the items can be use further analysis.

Discussion

The study examined the content validity of teacher quality instruments using Content Validity Ratio (CVR) analysis. The first research question sought answer on the total content validity of the teacher quality instrument. The total expert's agreement for all the six experts on forty-items were acknowledged and greater than 0.50%. This contributed that the items of the instrument measure what is supposed to measure. Polit et al. (2007) opined that panel agreement ≥ 0.50 for six panels could be considered as indication of good content validity. The result of the study was in line with research investigated by researchers such as (Cook and Beckman, 2006; Davis, 1992; Graham, et al., 2012; Ates et al., 2025) that inter-rater of panels above .5 is consider to excellent content validity.

The second research question answer was on content validity of each item and teacher quality instrument dimensions. The CVI /S-CVI technique was used to verify content validity index of four dimensions (Polit et al. (2007). All the items in the dimensions shown CVI of above 0.63. By using the rule of thumb of 0.80, content validity of the 40 items of teacher quality was acceptable with CVI /S-CVI (0.90) (Polit et al., 2007). Consequently, the result of this study was congruent with the study revealed by Aravamudhan and Krisahnaveni (2015) that content validity is regarded as a good step from the beginning of instrument development as it is essential as a prior condition for other validities.

Penultimately, the third research question answer was on reliability of teacher quality instrument. The reliability for all four dimensions of teacher quality met acceptable level of above .6. the reliability greater than .5 is considered as high reliability. The result of this current study was supported by Hair et al. (2010) that instrument reliability greater than .6 met the satisfactory level.

Conclusions

In line with the finding of this study that content validity of 94% for teacher quality was acceptable. Four dimensions measuring teacher quality had Cronbach alpha above .6 which shown satisfactory value. Also, the study concluded that kappa index of 0.68-1.00 for 22 items were acceptable and indicates perfect agreement among the panels used for the study.

Study Recommendations

In line with these findings, the study recommended among the following.

1. It is suggested that incoming research should make use of huge data so as to drawn an inference and confirm the results provided in this study.
2. It is also suggested that teacher quality instrument should be subjected to other method of doing content validity and reliability.
3. Lastly, data analysis like CFA and EFA can also be used to verify validity and reliability of teacher quality so that such instrument can be dependable.

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