

Development and Validation of a Multiple-Choice Civic Education Achievement Test for Senior Secondary School Students in Minna Education Zone, Niger State, Nigeria

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Abstract

This study developed and validated a Multiple-Choice Civic Education Achievement Test (CEAT) for Senior Secondary School Two (SSS II) students in Minna Education Zone, Niger State, Nigeria, guided by two objectives on the CEAT's validity index and reliability index. An instrumentation research design was adopted. The population comprised 5,868 SSS II students in public secondary schools in the zone and eight validators purposively selected for their specialisation in Educational Measurement and Evaluation and in Civic Education teaching. A sample of 361 students was drawn from six schools using a three-stage stratified and proportionate random sampling procedure guided by the Krejcie and Morgan (1970) table. The CEAT, comprising fifty (50) multiple-choice items built on a table of specifications based on the revised Bloom's taxonomy, served as the instrument, alongside an Expert Validation Report Template that the eight validators used to rate each item's relevance. Content validity was established from the validators' ratings, while reliability was determined by administering the CEAT once and computing internal consistency indices. Findings showed that all 50 items (100%) met the acceptable relevance threshold, with a Scale-Content Validity Index of 0.95 and a mean Item-Content Validity Index of 0.95. The instrument also returned a KR-20 coefficient of 0.84 and a Spearman-Brown corrected split-half coefficient of 0.76, both above the 0.70 benchmark. It was recommended among others that Civic Education teachers, school administrators, and curriculum experts should continue to subject Civic Education achievement tests to structured expert content validation, using an item-construction blueprint such as a table of specifications, to sustain the high content validity demonstrated by the CEAT.

Keywords: Development, Validation, Civic Education Achievement Test, Content Validity, Reliability

Introduction

Education remains the foundation of national development, and secondary education in particular is expected to prepare young people for higher learning, productive work, and active participation in the governance of their country. Civic Education was introduced into the Nigerian secondary school curriculum to strengthen democratic awareness by helping students understand how government works, what their rights and responsibilities are as citizens, and why the rule of law and peaceful coexistence matter (Federal Republic of Nigeria [FRN], 2014). For the subject to fulfil this purpose, however, teaching alone is not enough; it is equally necessary to assess, through sound instruments, whether students are actually acquiring the knowledge and values the curriculum intends.

Assessment in Civic Education, as in any subject, is only useful to the extent that the instrument used produces trustworthy results. Trustworthiness in test development rests on three foundational psychometric considerations: validity, reliability, and item analysis (Olutola & Olatoye, 2019). The validity index of an

achievement test indicates the extent to which its items accurately represent the content and objectives of the curriculum from which they are drawn; without this evidence, no score can be confidently interpreted as a true reflection of what a student has learned (Adam et al., 2023). Content validity is typically established through structured expert judgement, most often expressed through the Content Validity Index (CVI), which quantifies the extent to which subject specialists agree that individual items, and the instrument as a whole, are relevant to the construct being measured (Polit & Beck, 2006; Yusoff, 2019). Item analysis comprising the difficulty and discrimination indices complements validity and reliability by indicating how individual items function once an instrument is administered; it is ordinarily examined after an item pool has demonstrated adequate content validity, and falls outside the two objectives of the present study, which are limited to the CEAT's validity and reliability.

Even where an instrument is judged to cover the appropriate content, it must also produce consistent results before it can be trusted for either classroom or research use. The reliability index of an achievement test reflects the stability and internal consistency of the scores it generates; an instrument that yields markedly different results for the same students under comparable conditions cannot support dependable conclusions about their learning (Lawal & Ijeoma, 2021). Internal consistency is commonly estimated through procedures such as the Kuder-Richardson Formula 20 (KR-20), the split-half method with Spearman-Brown correction, and the Standard Error of Measurement (SEM), which together indicate how precisely an instrument measures the construct it targets (Taber, 2018).

National examination bodies such as the West African Examinations Council (WAEC), the National Examinations Council (NECO), the National Business and Technical Examinations Board (NABTEB), and the Joint Admissions and Matriculation Board (JAMB) subject their test items to rigorous psychometric scrutiny including expert content validation and item analysis before deployment. Classroom-level assessment in Civic Education rarely benefits from comparable scrutiny: evidence suggests that many teacher-made achievement tests, including those used in Civic Education, are constructed and administered without being subjected to any form of expert content validation or reliability analysis (Ihechu & Madu, 2016; Bichi & Musa, 2020). This weakens the extent to which classroom scores can be relied upon for grading, feedback, or curriculum evaluation. Within Niger State specifically, and in Minna Education Zone in particular, Civic Education continues to be assessed largely through improvised, teacher-made, and past-examination items that have not undergone standardised validation and reliability procedures (Ubani, 2012; Mohammed, 2025). This leaves teachers, school administrators, and policymakers in the zone without a dependable instrument for monitoring students' achievement in the subject.

It is against this gap that the present study was undertaken. Specifically, the purpose of the study was to develop a Multiple-Choice Civic Education Achievement Test (CEAT) and to establish its content validity and reliability, so as to provide Civic Education teachers, school administrators, and researchers in Minna Education Zone with a psychometrically sound instrument for assessing students' achievement in the subject.

Statement of the Problem

Civic Education occupies an important place in the Nigerian secondary school curriculum because of its role in promoting responsible citizenship and democratic participation, and the National Policy on Education expects the subject to instil desirable civic attitudes and values in learners (FRN, 2014). Realising this expectation, however, depends on the availability of assessment instruments that are both valid and reliable, since scores obtained from a poorly validated or unreliable test cannot be trusted to reflect students' actual mastery of civic knowledge.

Unlike the national examination bodies discussed above, Civic Education teachers in many Nigerian secondary schools construct and use tests that are not subjected to expert content validation (Olatunji & Adebayo, 2021; Muhammad et al., 2023). Within Minna Education Zone specifically, Civic Education is routinely assessed using improvised, teacher-made, and past-examination questions whose content validity and reliability have never been empirically established (Ubani, 2012; Mohammed, 2025; Iliasu, 2023). This deprives teachers and school administrators of dependable data for instructional decision-making and weakens confidence in the results generated from classroom assessment. There is, therefore, a clear gap in the availability of a validated and reliable Multiple-Choice Civic Education Achievement Test for SSS II students in Minna Education Zone. It was to close this specific gap by empirically establishing the validity index and the reliability index of a researcher-developed CEAT that the present study was carried out.

Objectives of the Study

The study was guided by the following two objectives. The study sought to:

1. determine the validity index of the Multiple-Choice Civic Education Achievement Test (CEAT) for Senior Secondary School students in Minna Education Zone, Niger State; and
2. determine the reliability index of the Multiple-Choice Civic Education Achievement Test (CEAT) for Senior Secondary School students in Minna Education Zone, Niger State.

Research Questions

The following two research questions guided the study:

1. What is the validity index of the Multiple-Choice Civic Education Achievement Test (CEAT) for Senior Secondary School students in Minna Education Zone, Niger State?
2. What is the reliability index of the Multiple-Choice Civic Education Achievement Test (CEAT) for Senior Secondary School students in Minna Education Zone, Niger State?

Methodology

The study adopted an instrumentation research design, which focuses on the systematic development, validation, and standardisation of instruments used for data collection and measurement in educational research (Creswell & Creswell, 2018). This design was appropriate because the study sought to develop and validate a Multiple-Choice Civic Education Achievement Test for SSS II students, so that the resulting CEAT could be adopted by Civic Education teachers, school administrators, and researchers in Minna Education Zone for assessing students' achievement in the subject.

The population of the study comprised two groups: 5,868 SSS II students in fourteen public secondary schools within Minna Education Zone, Niger State (Niger State Quality Assurance and Standards Agency for Schools, Chanchaga Area Office, 2025), from whom the study sample was drawn; and eight validators purposively selected for the content-validation exercise on the basis of their specialisation in Educational Measurement and Evaluation and in Civic Education teaching. A sample of 361 SSS II students was drawn from six public secondary schools using a three-stage procedure: stratification by Local Government Area (Bosso and Chanchaga), random selection of three schools within each stratum, and proportionate random sampling of students within each selected school, guided by the Krejcie and Morgan (1970) table for sample size determination. The three schools selected in Bosso LGA contributed 141 students to the sample, while

the three schools selected in Chanchaga LGA contributed 220 students, in proportion to the relative student population of each LGA.

Two instruments were used for data collection: the Civic Education Achievement Test (CEAT) and an Expert Validation Report Template. The CEAT, developed by the researcher, comprised fifty (50) multiple-choice items, each with four options (A–D), covering seven broad topics drawn from the SSS II Civic Education scheme of work for the first term: the Nigerian constitution, fundamental human rights, law and order, leadership and followership, public accountability, national security, and social justice. Item construction was guided by a table of specifications (test blueprint) based on the revised Bloom’s taxonomy, spanning the cognitive levels of knowledge, comprehension, application, analysis, synthesis, and evaluation (Bloom, 1956), to ensure that items were balanced across content areas and cognitive demand (Olutola & Olatoye, 2019). The distribution of items across content areas and cognitive levels is presented in Table 1.

Table 1: Table of Specifications for the Civic Education Achievement Test (CEAT)

Content Area	K	C	Ap	An	S	E	Total
The Nigerian Constitution	3	2	1	1	0	1	8
Fundamental Human Rights	2	2	2	1	1	0	8
Law and Order	2	1	2	1	0	1	7
Leadership and Followership	2	1	1	1	1	1	7
Public Accountability	1	2	2	1	1	0	7
National Security	1	1	1	2	1	1	7
Social Justice	1	1	1	1	1	1	6
Total	12	10	10	8	5	5	50

KEYS:

K = Knowledge;

C = Comprehension;

Ap = Application;

An = Analysis;

S = Synthesis;

E = Evaluation,

The Expert Validation Report Template was adapted from the Faculty of Education, Federal University Dutsin-Ma’s standard Validator’s Comments Form. It required each validator to: (a) record their institutional affiliation and area of specialisation; (b) rate every one of the 50 CEAT items as either 1 (relevant) or 0 (not relevant) with respect to content coverage, clarity of language, and relevance to the study objectives; and (c) provide an overall written comment and a recommendation on whether the instrument was fit for use. Ratings recorded on this template were used to compute the Item-Level Content Validity Index (I-CVI) for each item and the Scale-Level Content Validity Index (S-CVI) for the instrument as a whole.

Copies of the CEAT and the Expert Validation Report Template were submitted to eight validators: five specialists in Educational Measurement and Evaluation from the Department of Educational Psychology and Counselling, Federal University Dutsin-Ma, and three Civic Education teachers, one of whom also

serves as Head of Quality Assurance at a college in Dutsin-Ma. Each validator rated every item as relevant (1) or not relevant (0); these ratings were used to compute the I-CVI and S-CVI, with an I-CVI of 0.75 or higher taken as the acceptable relevance threshold (Yusoff, 2019; Polit & Beck, 2006). Because the eight-member panel falls within the six-to-ten-member range recommended for content-validation exercises (Lynn, 1986), both the average-method S-CVI and the stricter universal-agreement S-CVI, which requires perfect agreement (I-CVI = 1.00) for unqualified item retention, are reported in the Results for completeness.

Following validation and the incorporation of the validators' corrections, the CEAT was administered once to the full sample of 361 SSS II students. Because both the Kuder-Richardson Formula 20 (KR-20) and the split-half method with Spearman-Brown correction are single-administration procedures, one administration was sufficient to compute both reliability indices and the Standard Error of Measurement (SEM), following the recommended threshold of 0.70 for an acceptable reliability coefficient (Taber, 2018). Data were analysed using Python 3 (pandas and numpy) within the Classical Test Theory framework. Research Question One was answered using the Content Validity Index (I-CVI and S-CVI), while Research Question Two was answered using the KR-20 coefficient, the split-half (Spearman-Brown) coefficient, and the SEM.

Results

Research Question One: What is the validity index of the Multiple-Choice Civic Education Achievement Test (CEAT) for Senior Secondary School students in Minna Education Zone, Niger State?

Table 2: Item-Level Content Validity Index (I-CVI) of the CEAT

1	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6	Expert 7	Expert 8	I-CVI / Decision
Item 1	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 2	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 3	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 4	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 5	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 6	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 7	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 8	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 9	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 10	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 11	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 12	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 13	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 14	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 15	1	1	1	1	1	1	1	1	1.000 – Relevant

Item 16	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 17	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 18	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 19	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 20	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 21	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 22	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 23	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 24	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 25	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 26	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 27	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 28	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 29	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 30	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 31	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 32	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 33	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 34	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 35	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 36	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 37	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 38	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 39	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 40	1	1	1	1	1	1	1	1	1.000 – Relevant
Item 41	1	1	1	0	1	1	1	1	0.875 – Relevant
Item 42	1	1	1	0	1	1	1	1	0.875 – Relevant
Item 43	1	1	1	0	1	1	1	1	0.875 – Relevant
Item 44	1	1	1	0	1	1	1	1	0.875 – Relevant
Item 45	1	1	1	0	1	1	1	1	0.875 – Relevant
Item 46	1	1	1	0	1	1	1	1	0.875 – Relevant
Item 47	1	1	1	0	1	1	1	1	0.875 – Relevant

Item 48	1	1	1	0	1	1	1	1	0.875 – Relevant
Item 49	1	1	0	0	1	1	1	1	0.750 – Relevant
Item 50	1	1	0	0	1	1	1	1	0.750 – Relevant

Note. I-CVI = Item-Level Content Validity Index; S-CVI = Scale-Level Content Validity Index. Items with I-CVI ≥ 0.75 are considered relevant (Yusoff, 2019; Polit & Beck, 2006).

Table 2 shows that all 50 CEAT items (100%) attained an I-CVI of at least 0.75. Forty items (80%) recorded an I-CVI of 1.00, eight items (16%) recorded an I-CVI of 0.875, while two items (4%) recorded an I-CVI of 0.75. The Scale-Level Content Validity Index (S-CVI) was 0.95, while the mean I-CVI was also 0.95. These values indicate that the CEAT demonstrated a high level of content validity and that the items adequately represented the content domains of the Senior Secondary School II Civic Education curriculum.

Research Question Two

What is the reliability index of the Multiple-Choice Civic Education Achievement Test (CEAT) for Senior Secondary School students in Minna Education Zone, Niger State?

Table 3: Reliability Analysis of the CEAT

Reliability Measure	Value	Interpretation
Number of Items (k)	50	Full-length test
Number of Students (N)	361	Full study sample
Mean Score (M)	19.96	$\approx 40\%$ of 50 marks
Score Variance (σ^2)	22.115	Moderate spread of scores
KR-20 Coefficient	0.843	High (acceptable for classroom use, ≥ 0.70)
Split-Half Correlation (r)	0.609	Uncorrected half-test correlation
Spearman-Brown Corrected Reliability	0.757	Acceptable (≥ 0.70)
Standard Error of Measurement (SEM)	3.381	Scores accurate to ± 3.38 marks

Note. KR-20 = Kuder-Richardson Formula 20; SEM = Standard Error of Measurement (in score points). A reliability coefficient of ≥ 0.70 is considered acceptable (Taber, 2018).

Table 3 shows that the CEAT obtained a KR-20 coefficient of 0.84, indicating good internal consistency and confirming that the instrument is reliable for measuring SSS II students' achievement in Civic Education. The Spearman-Brown corrected split-half coefficient was 0.76, indicating an acceptable level of consistency between the two halves of the test, while the Standard Error of Measurement was 3.38, implying that a student's observed score may differ from their true score by approximately ± 3.38 marks. Since both reliability coefficients exceeded the 0.70 benchmark (Taber, 2018), the CEAT is considered suitable for classroom and research use in assessing Civic Education achievement.

Discussion of Findings

Content Validity of the CEAT

The finding that the CEAT achieved a Scale-Content Validity Index of 0.95 (average method) and a mean Item-Content Validity Index of 0.95 confirms that the instrument possesses strong content validity. This is consistent with the position of Polit and Beck (2006), who established that a mean I-CVI of 0.78 or above provides sufficient evidence of adequate content validity for a measurement instrument. The high CVI values obtained indicate that the CEAT items accurately represent the key domains of the SSS II Civic Education curriculum, including the constitution, fundamental human rights, law and order, leadership and followership, and social justice. This finding aligns with Olatunji and Olorunsola (2021), who similarly reported strong construct-validation evidence for a Senior Secondary School Civic Education Achievement Test developed for use in Southwest Nigeria, and supports the broader argument of Adam et al. (2023) that the development and validation of achievement tests is critical to ensuring that students' civic competencies are assessed objectively. The use of a table of specifications during item construction, combined with structured expert review, appears to have contributed to the validity indices recorded, corroborating Anikweze (2014), who described careful blueprinting and expert validation as indispensable steps in achieving content validity for teacher-developed tests. Because eight validators rated the instrument, within the six-to-ten-member range recommended for content-validation exercises (Lynn, 1986), the more conservative universal-agreement index (S-CVI/UA = 0.80) is also reported alongside the average-method index for completeness.

Reliability of the CEAT

The KR-20 coefficient of 0.84 obtained for the CEAT indicates good internal consistency and reflects an instrument capable of measuring civic knowledge consistently within a single test administration (see Methodology); since this value exceeds the 0.70 threshold recommended for achievement tests, the instrument is considered reliable for both classroom and research use (Taber, 2018). This finding is consistent with Aliyu and Mohammed (2020), who similarly reported acceptable internal consistency for a multiple-choice Civic Education achievement test developed for use in Kano State, and it compares favourably with the empirical reliability coefficients of 0.86 and 0.87 reported by Eleje and Esomonu (2018) and Esomonu and Eleje (2017) respectively for other multiple-choice achievement tests developed for Nigerian secondary school students. The Spearman-Brown corrected split-half coefficient of 0.76, while still acceptable, was comparatively lower than the KR-20 estimate. Lawal and Ijeoma (2021) associate this pattern with variability in item quality across a test, while Bichi and Musa (2020) attribute it to the multidimensional content structure typical of Civic Education, which tends to yield lower internal consistency values than more homogeneous subjects. The SEM of 3.38 means that a student's true score is likely to fall within about ± 3.38 marks of their observed score; scores close to a pass mark or grade boundary should therefore be interpreted with appropriate caution, and confidence intervals should be applied when using CEAT results to make decisions about specific students.

Conclusion

Based on the findings of this study, two conclusions were drawn. First, the Civic Education Achievement Test (CEAT) possesses high content validity, with a Scale-Content Validity Index of 0.95 and a mean Item-Content Validity Index of 0.95, confirming that the instrument adequately represents the SSS II Civic Education curriculum. Second, the CEAT demonstrated satisfactory reliability, with a KR-20 coefficient of 0.84, a Spearman-Brown corrected split-half coefficient of 0.76, and a Standard Error of Measurement of 3.38, indicating that the instrument produces sufficiently consistent scores for assessing students'

achievement in Civic Education. The CEAT can therefore be considered a valid and reliable instrument for measuring the achievement of SSS II students in Civic Education within Minna Education Zone.

Recommendations

Based on the findings and conclusion of this study, the following recommendations were made:

1. Civic Education teachers, school administrators, and curriculum experts should continue to subject Civic Education achievement tests to structured expert content validation, using an item-construction blueprint such as a table of specifications, to sustain the high content validity demonstrated by the CEAT.
2. Secondary school Civic Education teachers and researchers in Minna Education Zone should adopt the CEAT to assess students' achievement in the subject, while applying the Standard Error of Measurement (± 3.38) as a caution when interpreting scores that fall close to pass marks or grade boundaries.

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