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Predictors of Candidates' Performance in the Unified Tertiary Matriculation Examination (UTME) in South-West Nigeria (2010–2024)

ADEAGBO, Joseph Olusegun[1]
adeagbojo@eauedoyo.edu.ng.
ORCID: 0009-0005-8569-8544.
08035857820

ATANDA, Ademola Ibukunolu[2]
ademolaui@gmail.com
ORCID:0009-0009-4452-1039

ADEPOJU, Olufemi Adetunji[3]
adepojuoa@eauedoyo.edu.ng.
ORCID: 0009-0009-4452-1039.

AJIBADE, Ismail Oyebanji[4]
ajibadeio@eauedoyo.edu.ng.
ORCID: 0009-0009-0122-3058.

AFOLABI, Rebecca A.[1]
afolabira@eauedoyo.edu.ng.
ORCID: 0009-0004-1809-6124.

FEYISETAN, Christianah Toyin[5]
Nigeria. feyisetanct@eauedoyo.edu.ng.
ORCID: 0009-0005-7156-3438

SALAWU, Ibrahim Olatunde[6]
isalawu@noun.edu.ng.
ORCID: 0000-0002-2739-9221
08033535423

ADEOTI, Julius Olakunle[7]
adeotijo@eauedoyo.edu.ng.
ORCID: 0009-0008-7948-9684

[1]Department of Educational Management, Emmanuel Alayande University of Education, Oyo, Nigeria.
[2]Department of Educational Management, University of Ibadan, Ibadan, Nigeria.
[3]Department of Educational Foundations & Curriculum Studies Emmanuel Alayande University of Education, Oyo
[4]Department of Social Studies and Civics Education Emmanuel Alayande University of Education, Oyo, Nigeria.
[5]Department of Special Education/Guidance and Counselling Emmanuel Alayande University of Education, Oyo,
[6]Department of Educational Technology Emmanuel Alayande University of Education, Oyo, Nigeria. [7]Department of Economics Emmanuel Alayande University of Education, Oyo, Nigeria.

Abstract

This study examined the predictors of candidates' performance in Nigeria's Unified Tertiary Matriculation Examination (UTME) in South-west Nigeria, and the extent to which UTME scores and historical performance patterns predict subsequent academic and examination outcomes, over the period 2010–2024. A retrospective cohort design linked UTME and first-year academic records for 2,250 undergraduates admitted between 2010 and 2024 to six universities (four federal, two state) across Lagos, Oyo, Osun and Ekiti States, supplemented by survey data from 750 teachers and thematic analysis of teacher and computer-based-testing (CBT) centre personnel accounts. The study drew on the Education Production

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Function, Messick's unified view of validity, Human Capital Theory and Social Reproduction Theory. A researcher-developed instrument, the Assessment of Factors Influencing UTME Performance Questionnaire, showed good internal consistency (α = .84; subscale range .72–.86) and a six-factor structure confirmed by exploratory factor analysis (KMO = .87; Bartlett's p < .001). UTME score was positively associated with first-year CGPA, r = .681, 95% CI [.658, .703], p < .001, representing a substantial share of shared variance between the two measures. A regression of UTME score on background characteristics showed that CBT familiarity, school type, study hours, guardian education and school location were each positively and significantly associated with UTME performance (all p < .001), with gender showing a smaller but significant association (p = .030). Historical UTME performance data also significantly predicted future candidates' performance patterns, F(1, 2248) = 326.28, p < .001, R^2 = .127, indicating moderate but meaningful forecasting value. Qualitative accounts from teachers and CBT-centre personnel identified digital readiness, family and socioeconomic support, study practices, and examination-centre infrastructure as perceived influences on performance. The findings support the continued use of UTME as one component of admission decisions, but the associations with school context and digital familiarity point to unequal preparation opportunities that raise equity concerns. Contextualised admission benchmarks, multiple admission criteria, CBT familiarisation programmes, and expanded CBT infrastructure are recommended.

Keywords: predictors of performance, Unified Tertiary Matriculation Examination, computer-based testing.

Introduction

Entrance examinations are widely used to select students for higher education. Their value depends partly on whether scores predict later academic performance and partly on whether their use gives students from different social and educational backgrounds fair opportunities. In Nigeria, the Unified Tertiary Matriculation Examination (UTME), administered by the Joint Admissions and Matriculation Board (JAMB), is the central component of university admission; JAMB describes the UTME as a ranking examination, with other parameters considered in determining admissibility (JAMB, 2024). Since the Board's establishment under JAMB Decree No. 2 of 1978, the UTME has remained the primary criterion by which the great majority of candidates are judged eligible for tertiary admission, and, as a standardised test, it plays a critical role in shaping the academic and professional futures of Nigerian youths.The predictive validity of the UTME remains contested. Some Nigerian studies report positive associations between admission or screening scores and university performance, while others report weak or inconsistent relationships (Adeniyi et al., 2010; Ajala, 2010; Salahdeen & Murtala, 2005; Haruna et al., 2024). Differences in sample, discipline, outcome measure and statistical method may partly explain these conflicting findings. At the same time, a separate body of work has examined what predicts candidates' UTME scores themselves, pointing to institutional factors such as school type and location, socio-demographic factors such as gender and guardian education, and technological factors such as digital readiness and familiarity with computer-based testing (CBT) (Olatunji & Fashiku, 2020; Afolabi, 2019; Adegbija & Adekoya, 2020; Abdulkareem & Lennon, 2025). The expansion of CBT since 2015 has sharpened these equity questions, since candidates differ markedly in their access to computers, connectivity, electricity, test preparation and prior digital experience. A score may therefore reflect opportunity to learn and familiarity with the testing environment as well as subject knowledge. These two strands of enquiry — what predicts UTME performance, and what UTME performance in turn predicts — are rarely examined together, yet they are closely related: both bear on whether, and under what conditions, UTME scores can be trusted as a fair and informative basis for admission decisions. Evidence drawn from admitted students alone is also subject to range restriction and selection bias, because applicants who were not admitted have no first-year outcomes to observe. This study addresses both strands within a single framework, using linked UTME and first-year records from six South-western Nigerian universities together with fifteen years of historical UTME performance data, and treats the predictors of UTME performance, the predictive validity of UTME for subsequent academic performance, and the forecasting value of historical performance data as related but distinct questions.

Objectives of the Study

The specific objectives of the study were to:

1. examine the relationship between candidates' UTME scores and their first-year undergraduate academic performance;
2. determine whether UTME scores explain statistically significant additional variance in first-year performance after adjustment for background characteristics;

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3. identify the socio-demographic and institutional factors that significantly predict candidates' UTME performance;
4. assess the extent to which historical UTME performance data predict future candidates' performance patterns; and
5. describe teachers' and CBT-centre personnel's perceptions of the factors affecting UTME performance and examination access.

Research Questions

The following questions guided the study:

1. What is the relationship between candidates' UTME scores and their first-year undergraduate academic performance?
2. Do UTME scores explain statistically significant additional variance in first-year performance after adjustment for background characteristics?
3. What socio-demographic and institutional factors significantly predict candidates' UTME performance?
4. Do historical UTME performance data predict future candidates' performance patterns in South-west Nigeria

Research Hypotheses

The following null hypotheses were tested:

H_{01}: UTME scores are not significantly associated with candidates' first-year undergraduate academic performance.

H_{02}: UTME scores do not explain statistically significant additional variance in first-year performance after adjustment for background characteristics.

H_{03}: UTME performance does not differ significantly by school type, school location, gender, guardian education, study hours, and CBT familiarity.

H_{04}: Historical UTME performance data do not significantly predict future candidates' performance patterns in South-west Nigeria.

Scope of the Study

This study examined predictors of candidates' UTME performance and the predictive validity of UTME scores over the fifteen-year period from 2010 to 2024. It was conceived to cover the six South-west states of Nigeria (Ekiti, Lagos, Ogun, Ondo, Osun and Oyo), a zone with a high concentration of secondary schools, tertiary institutions and UTME candidates. In practice, the participating institutions in Ogun and Ondo States did not release the required student records, so the achieved sample was drawn from six universities across Lagos, Oyo, Osun and Ekiti States only. Findings are reported, and should be interpreted, with this narrower geographic coverage in mind, notwithstanding the South-west framing in the title. Institutional and operational challenges confronting CBT centres, and detailed year-on-year trend analysis of UTME performance, fall outside the scope of the present article and are addressed elsewhere.

Significance of the Study

This study provides empirical evidence on the predictors and predictive validity of candidates' UTME performance in South-west Nigeria that should benefit several stakeholders. For JAMB and policymakers, the findings clarify which background and institutional factors are most strongly associated with UTME performance, and so where equity-focused interventions might be targeted. For universities and admissions officers, the evidence on the UTME–CGPA relationship informs decisions about how much weight to place on UTME scores relative to other admission criteria. For teachers and school administrators, the study underscores the value of CBT familiarisation, continuous professional development and structured study support. For parents and students, it clarifies the factors associated with UTME success, including effective study habits, guardian support and digital preparedness. More broadly, the study contributes to the body of knowledge on educational assessment and test validity in Nigeria, and to the improvement of the quality and fairness of the university admission system.

Literature Review and Theoretical Framework

Predictive validity of Entrance Examination

Predictive validity concerns the extent to which scores are associated with a relevant future criterion, commonly first-year grade point average. International research generally reports positive but imperfect associations between admission-test

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scores and university grades, with magnitudes varying by examination, institution, population and outcome measure (Kuncel et al., 2001; Zwick, 2002). A predictive relationship does not mean that a test determines success or captures every dimension of readiness; it shows only that scores carry information about a later outcome. Evidence from the United States suggests that controlling for socioeconomic status leaves the test–grade relationship largely intact (Sackett et al., 2012), illustrating that group differences in scores and the predictive usefulness of scores are separate questions. In the Nigerian context, findings on predictive validity are mixed. The Joint Admissions and Matriculation Board determines students' entry into Nigerian tertiary institutions, and some scholars have questioned the adequacy of UTME scores as the sole entrance criterion (Adeniyi et al., 2010; Bamgboye et al., 2001; Kale, 2004; Salahdeen & Murtala, 2005; Ajala, 2010). Other Nigerian work reports more favourable predictive evidence (Haruna et al., 2024; Adeyemi, 2017), and these differences in sample, discipline and statistical method help explain the continued debate over whether, and how, UTME scores should be used in admission decisions.

Predictors of UTME Performance

Institutional Factors

Adedayo (2018) argues that inadequate infrastructure, poorly trained teachers and outdated curricula contribute to poor JAMB performance, while Aladejana and Ojedokun (2012) and Zhenseh and Ogunode (2022) similarly found that inadequate funding and poor teacher training leave many Nigerian secondary school teachers without the training, motivation or infrastructure needed to prepare students effectively for external examinations. School type and location are consistently implicated: Olatunji and Fashiku (2020) compared rural and urban secondary schools in Ekiti State and found that school location significantly influenced UTME performance, with urban schools outperforming rural ones across all years considered, while Afolabi (2019), analysing UTME trends in South-west Nigeria, found a performance skew towards urban schools attributed to greater access to coaching and digital resources.

Social Demographic Factors

Candidates' socio-economic and family background has repeatedly been linked to performance. Candidates from wealthier, better-educated households tend to have access to better learning environments, extra coaching and internet resources, and thes566803e advantages are associated with higher UTME scores (Olafogha et al., 2023). Findings on gender are more mixed, with some studies reporting a small male advantage in science-related subjects and others finding no significant gender difference once school type and socio-economic status are controlled for (Uko & Nnadi, 2017; Idris & Lawal, 2021).

Technological Factors

The introduction of CBT by JAMB in 2015 aimed to reduce malpractice and enhance test-administration efficiency, but a lack of digital literacy and unequal access to ICT have disadvantaged candidates in public and rural schools (Adegbija & Adekoya, 2020; Abdulkareem & Lennon, 2025). Candidates who are comfortable with digital testing environments appear to have a substantial advantage, with important implications for equity, since candidates from resource-poor schools and rural areas may have fewer opportunities to develop digital skills.

Historical Performance as a Predictor of Future Performance

A further strand of evidence treats aggregate historical examination performance itself as a predictor of future performance patterns, relevant to forecasting and educational planning. UTME performance in Nigeria has shown substantial year-to-year fluctuation rather than a smooth trajectory: the number of candidates sitting the examination has generally remained high, the proportion scoring 200 and above has fluctuated considerably, and performance has, on balance, improved since the introduction of CBT, notwithstanding a marked disruption in 2020 attributable to the COVID-19 pandemic (Joint Admissions and Matriculation Board, 2010–2024). Detailed year-on-year trend analysis and the institutional and operational challenges confronting CBT centres are examined at length elsewhere; the present study draws on this literature only to motivate the forecasting question addressed in Research Question 4, namely whether historical performance data carry predictive information for future performance patterns.

Theoretical Framework

Messick's (1989) unified view of validity is the primary framework for this study: validity concerns the evidence supporting score interpretations and the consequences of score use. This study addresses external (predictive) evidence — whether

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UTME scores predict first-year performance — and equity-related consequences — whether the correlates of UTME performance point to unequal preparation opportunities. The Education Production Function (Hanushek, 1986) treats educational outcomes as products of student inputs, school experiences, institutional conditions and family resources, so that the UTME score is one input among several rather than a complete representation of academic potential; this framework underpins the analysis of institutional and socio-demographic predictors of UTME performance (Research Question 3). Human Capital Theory (Becker, 1964) helps explain why institutions use predictive information such as UTME scores to allocate scarce university places efficiently, providing the rationale for examining predictive validity (Research Questions 1 and 2). Social Reproduction Theory (Bourdieu & Passeron, 1977) draws attention to how educational institutions may reproduce social advantage by rewarding cultural and material capital that is unevenly distributed across social classes, informing the equity concerns raised by the socio-demographic and institutional predictors examined in this study. Together, these perspectives support treating the predictors of UTME performance, the predictive validity of UTME scores, and the forecasting value of historical performance data as related facets of a single underlying question: how well, and how fairly, does the UTME serve its intended purpose?

Research Methodology

Design

The study used a retrospective cohort design with linked UTME and university academic records for students admitted between 2010 and 2024, supplemented by a survey of teachers and a qualitative component gathering the perceptions of teachers and CBT-centre personnel. It relied on existing records and followed students only to the end of their first year; it is not a prospective longitudinal design, and the detailed year-on-year trend analysis reported elsewhere is outside its scope.

Population, Setting and Sample

The target population comprised candidates who sat the UTME between 2010 and 2024 in the six South-west Nigerian states. The achieved sample was drawn from six universities in four of these states: University of Lagos (federal), Lagos State Univers566803ity (state), University of Ibadan (federal), Emmanuel Alayande University of Education (state), Ekiti State University (state), and Obafemi Awolowo University (federal), giving a total of 2,250 students. Ogun and Ondo States could not be included, as the institutions initially identified in these states did not release the required student records. Institutional ownership (federal/state) was recorded separately from secondary-school type (private/public) and was not used as a proxy for it. Students were included if they sat the UTME between 2010 and 2024, were admitted through UTME, had complete UTME and first-year records, and met consent and data-use requirements. Students with incomplete core records, transfer students, and those admitted through other routes were excluded. Proportionate stratified sampling was applied across institutions, disciplines and admission years. A parallel survey of 750 secondary-school teachers, proportionately distributed across the same four states, provided data on institutional and classroom-level factors. The minimum required sample was checked using Yamane's (1967) formula, $n = N / (1 + Ne^2)$, with $e = .05$ and N taken as the approximate number of UTME candidates in South-west Nigeria annually ($N \approx 1{,}500{,}000$); the achieved sample of 2,250 students substantially exceeds the resulting minimum ($n \approx 400$), providing strong statistical power. The qualitative sample comprised teachers and CBT-centre personnel from secondary schools and examination centres in the participating areas.

Table 1: Characteristics of the Study Sample by Institution

Institution	Ownership	State	N	Mean UTME (SD)	Mean CGPA (SD)
University of Lagos	Federal	Lagos	600	216.45 (28.12)	3.42 (0.48)
Lagos State University	State	Lagos	400	208.76 (30.45)	3.18 (0.52)
University of Ibadan	Federal	Oyo	400	219.83 (27.89)	3.51 (0.45)
Emmanuel Alayande University of Education	State	Oyo	250	204.21 (32.14)	3.02 (0.58)
Ekiti State University	State	Ekiti	250	205.93 (31.56)	3.08 (0.55)
Obafemi Awolowo University	Federal	Osun	350	212.47 (29.78)	3.28 (0.50)
Total	—	—	2,250	212.54 (29.85)	3.29 (0.52)

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Note. N for each institution is fixed by the sampling design (Section 3.2); means and standard deviations are as reported in the source data.

Of the 2,250 students, 950 (42.2%) were male and 1,300 (57.8%) were female; 1,050 (46.7%) had attended state (public) secondary schools and 1,200 (53.3%) federal (private) secondary schools; and 2,050 (91.1%) had attended urban schools and 200 (8.9%) rural schools. These aggregate figures, rather than institution-level breakdowns, are reported here because per-institution demographic splits could not be fully reconciled against the aggregate totals; the small rural subgroup (n = 200) in particular limits the precision of any urban–rural comparison and should be interpreted with caution.

Measures

UTME scores were obtained from JAMB records. The total score (0–400) is the sum of scores in English Language, Mathematics and three programme-relevant subjects; this article reports raw scores. First-year performance was measured by cumulative grade point average (CGPA, 0–5 scale) from official transcripts, covering the first two semesters; courses graded Incomplete or Withdrawal were excluded. Background variables were gender (female = 1, male = 0), secondary-school type (private = 1, public = 0), school location (urban = 1, rural = 0), guardian education (5-point scale from no formal education to postgraduate), socio-economic status (a composite index), study hours (self-reported daily study time) and CBT familiarity (a composite score derived from questionnaire items). The Assessment of Factors Influencing UTME Performance Questionnaire (AFIUTMEQ) was developed for the study and comprises 45 items across six subscales (socio-demographic factors, institutional factors, study habits and preparation, CBT readiness and familiarity, parental and family support, and psychological factors). Content validity was established through expert review by specialists in educational measurement and evaluation. Exploratory factor analysis (principal axis factoring, varimax rotation) supported the six-factor structure, with loadings from .52 to .84 (KMO = .87; Bartlett's test $p < .001$). Cronbach's alpha was .84 for the total scale and ranged from .72 to .86 across subscales.

Ethical Consideration

Ethical approval and data-access permissions were obtained as stated above. Records were de-identified before analysis and stored on password-protected servers. Participation in the questionnaire and qualitative components was voluntary, and confidentiality and anonymity were maintained throughout; data were used strictly for academic and policy-development purposes.

Data Analysis

The association between UTME score and first-year CGPA (H1) was estimated with Pearson's r and a 95% confidence interval based on the Fisher transformation. Incremental validity (H2) was assessed with hierarchical regression: Model 1 included institution, admission year and gender; Model 2 added school type, school location, guardian education, socio-economic status, study hours and CBT familiarity; Model 3 added UTME score, with its contribution reported as $\Delta R^2 = R^2(\text{Model 3}) - R^2(\text{Model 2})$. A separate multiple regression examined the background correlates of UTME score (H3). Because students are nested within universities, standard errors were clustered by institution. Historical UTME performance data (2010–2024) were analysed with simple linear regression to assess their value in predicting future candidates' performance patterns (H4), with the Scheffé post hoc test used, where relevant, to determine the direction of significant differences. All hypotheses were tested at the .05 level of significance. Qualitative accounts from teachers and CBT-centre personnel were analysed thematically.

Presentation of Results

Descriptive Statistics and Intercorrelations

Table 2: Descriptive Statistics and Intercorrelations Among Study Variables

Variable	M	SD	1	2	3	4
1. UTME score	212.54	29.85	—			
2. First-year CGPA	3.29	0.52	.681**	—		
3. Study hours	3.19	0.84	.421**	.385**	—	
4. CBT familiarity	3.24	0.71	.485**	.412**	.356**	—
5. Guardian education	3.18	0.91	.328**	.294**	.245**	.312**

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Variable	M	SD	1	2	3	4
6. SES index	2.94	0.82	.301**	.267**	.218**	.289**

*Note. N = 2,250. ** p < .01 (two-tailed). Columns 5 and 6 (guardian education, SES index) are omitted for brevity; full intercorrelations are available from the corresponding author.*

UTME Score and First-year CGPA (H1)

UTME score was positively associated with first-year CGPA, r = .681, 95% CI [.658, .703], p < .001 (Table 2). The squared correlation, r^2 = .464, is the proportion of variance shared by the two variables in this pooled sample; it is not an estimate of the incremental contribution of UTME once other predictors are taken into account. H_{01} was rejected, and H1 was supported. This pooled estimate should be read with two cautions. First, the six institution-level means in Table 1 are closely aligned (UTME and CGPA means correlate above .99 across institutions), so part of the pooled correlation may reflect differences between institutions in selectivity and grading rather than the relationship among students within an institution; within-institution correlations would be needed to separate these components fully. Second, only admitted students are included, so range restriction may affect the estimate; because range restriction would normally attenuate rather than inflate a correlation, it is unlikely to explain the high value observed, but it still limits generalisation to the full applicant pool.

Incremental Validity of UTME (H2)

Table 3: Hierarchical Regression Predicting First-Year CGPA

Model	Predictors	R^2	ΔR^2	F change (p)
1	Institution, admission year, gender	[to insert]	—	[to insert]
2	Model 1 + school type, location, guardian education, SES, study hours, CBT familiarity	[to insert]	[to insert]	[to insert]
3	Model 2 + UTME score	[to insert]	[to insert]	[to insert]

Note. An earlier draft of this table reported values that could not be reconciled with the model's own descriptive statistics and have accordingly been removed rather than carried forward. R^2, ΔR^2 and F-change values should be inserted from the re-estimated model output, together with UTME's standardised β and 95% CI from Model 3, before submission.

Pending re-estimation of the values in Table 3, the strong zero-order correlation reported in Section 4.2 indicates that UTME score is likely to make a statistically significant incremental contribution to predicting first-year CGPA beyond the background characteristics in Model 2, consistent with H2; this should be confirmed against the re-estimated ΔR^2 before the finding is reported as conclusive.

Background Predictors of UTME Performance(H3)

Table 4: Regression Model Predicting UTME Scores

Predictor	B	SE	t	p	95% CI
(Intercept)	112.63	11.45	9.84	< .001	[90.18, 135.08]
Gender (female)	2.55	1.17	2.18	.030	[0.25, 4.85]
School type (private)	8.74	1.10	7.95	< .001	[6.58, 10.90]
School location (urban)	5.24	1.15	4.56	< .001	[2.98, 7.50]
Guardian education	6.29	1.08	5.82	< .001	[4.17, 8.41]
Study hours	7.52	0.90	8.34	< .001	[5.75, 9.29]
CBT familiarity	9.16	0.94	9.71	< .001	[7.31, 11.01]

Note. N = 2,250. B = unstandardised coefficient, expressed in UTME points per one-unit change in each predictor (or for the group coded 1 versus 0); relative predictor importance should therefore be judged from standardised coefficients, not from B directly. Model summary statistics (R^2, adjusted R^2 and F(6, 2243)) are not reported here because the values in an earlier draft were identical to those of the CGPA model in Table 3 and could not be reconciled with the coefficients above; corrected values should be inserted from the model output before submission.

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Each background variable was positively and significantly associated with UTME score, with gender showing the smallest association (B = 2.55, p = .030) and CBT familiarity the largest (B = 9.16, p < .001), followed by school type (B = 8.74), study hours (B = 7.52), guardian education (B = 6.29) and school location (B = 5.24), all other predictors held constant. H_{03} was rejected, and H3 was supported: UTME performance differs significantly by school type, school location, gender, guardian education, study hours and CBT familiarity. These are associations, not causal effects, and the model did not include socio-economic status or institution as additional covariates.566803

Historical UTME Performance Data and Future Performance Patterns (H4).

Table 5: Regression Analysis of Historical UTME Performance Data Predicting Future Candidates' Performance Patterns

Source	SS	df	MS	F	p
Regression	645.056	1	645.056	326.28	< .001
Residual	4,445.056	2,248	1.977		
Total	5,090.112	2,249			

Model Summary

R	R^2	Adjusted R^2	F	p
.356	.127	.126	326.28	< .001

Note. Predictor: historical UTME performance data; dependent variable: future UTME candidates' performance patterns. The R^2, adjusted R^2 and F-value reported here have been recomputed from the sums of squares and degrees of freedom above ($F = MS_{regression} / MS_{residual} = 645.056 / 1.977 = 326.28$; $R^2 = SS_{regression} / SS_{total} = 645.056 / 5{,}090.112 = .127$), to resolve an inconsistency in an earlier draft in which the reported R^2 (.439) and F-value (1,759.00) did not match these sums of squares.

A simple linear regression was computed to assess the extent to which historical UTME performance data predict future candidates' performance patterns. The model was statistically significant, $F(1, 2248) = 326.28$, $p < .001$, $R^2 = .127$, indicating that historical performance data explain a modest but meaningful proportion of the variance in future performance patterns. H_{04} was rejected, and H4 was supported: historical UTME performance data have significant, if moderate, predictive value for future candidates' performance patterns, supporting their use in forecasting and educational planning alongside the individual-level predictors examined in Sections 4.2–4.4.

Qualitative Findings

Four themes emerged from teachers' and CBT-centre personnel's accounts.

1. Digital readiness and CBT familiarity: Respondents consistently identified digital readiness as central to candidates' success, noting that some candidates who had never used a computer struggled during the examination.
2. Family and socio-economic support: Respondents observed that candidates from well-educated families tend to do better because of support at home and access to learning resources.
3. Study practices and preparation: Teachers reported that regular, structured study was associated with better outcomes.
4. Infrastructure and examination conditions: CBT-centre operators described network failure, poor connectivity and power interruptions, including repeated restarts of candidates' sessions and recurring generator and fuel costs, and noted that these problems disproportionately affect rural and underserved areas.

These accounts describe perceptions and do not measure the size of any factor's effect; they are offered as context for, and broadly corroborate, the quantitative findings in Sections 4.2–4.5.

Discussion

UTME scores were positively associated with first-year CGPA (r = .681), suggesting that the scores carry useful information about early university performance, though this does not mean that scores independently determine success or capture every dimension of readiness; the correlation is larger than the moderate associations generally reported internationally (Kuncel et al., 2001; Zwick, 2002), and pooling across institutions that differ in selectivity and grading may

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inflate it, so within-institution and clustered estimates are needed before the magnitude of the relationship is generalised. The associations of UTME scores with school type, school location, guardian education, study hours and CBT familiarity are consistent with the view that scores reflect opportunity to learn and preparation as well as aptitude, in line with the Education Production Function and Social Reproduction Theory, and the Nigerian literature points the same way (Olatunji & Fashiku, 2020; Afolabi, 2019; Adegbija & Adekoya, 2020; Abdulkareem & Lennon, 2025); if scores reflect access to quality schooling and test preparation, using the UTME as the sole admission criterion may disadvantage capable students from less advantaged backgrounds, although this does not by itself show that the UTME is biased, since group differences in test scores and differences in how well scores predict later performance are separate questions that a fuller fairness analysis would need to examine (Messick, 1989).

The finding that historical UTME performance data significantly predict future performance patterns, albeit with a moderate effect size ($R^2 = .127$) once the underlying sums of squares were reconciled, indicates that aggregate trend data of the kind analysed here can usefully inform forecasting and policy planning, even though most of the variance in future performance remains unexplained by past performance alone; this finding is best read as a complement to, rather than a substitute for, the individual-level predictors examined above, since historical data may help planners anticipate broad shifts in cohort performance while CBT familiarity, study habits and school-related factors offer more actionable levers for improving individual candidates' performance. The qualitative accounts from teachers and CBT-centre personnel are consistent with the regression results, particularly on digital readiness, family support and examination-centre conditions; because they describe perceptions rather than measured effects, they illustrate possible mechanisms rather than confirming them, and the recurring mention of network failure, poor connectivity and power interruptions suggests that some of the institutional variance in observed UTME scores may reflect examination-day conditions rather than candidates' underlying preparedness. The study covers selected universities in four South-western states and should not be generalised automatically to other regions, to the two South-west states not represented in the achieved sample, or beyond admitted students, given the attendant range restriction, self-report and nesting limitations; the hierarchical regression and background-correlates model summary also require re-estimation from the source data before their figures can be finalised, and detailed year-on-year trend analysis and institutional and operational challenges at CBT centres remain outside the scope of this article.

Summary

Among students in the sampled universities, higher UTME scores were associated with stronger first-year academic performance, and background characteristics — particularly CBT familiarity, school type, study hours, guardian education and school location — significantly predicted UTME performance itself, while historical UTME performance data also had significant, if moderate, value in predicting future performance patterns. Taken together, the evidence supports using the UTME as one component of admission decisions, but not as a complete, context-free or causal measure of academic potential: the associations with school context, guardian education, study practices and CBT familiarity indicate that unequal preparation opportunities may shape examination outcomes, with implications for the fairness of using UTME scores alone.

Recommendations

1. Universities should retain the UTME as a significant component of admission decisions while combining it with continuous assessment, subject-specific tests, structured interviews and contextualised benchmarks that account for applicants' school and socio-economic background
2. JAMB, for its part, should expand CBT infrastructure and training, including additional centres, mobile units for rural and remote communities, free pre-UTME familiarisation and simulation programmes, and transparent candidate feedback and monitoring.
3. Government and policymakers should increase investment in secondary education and integrate digital literacy into the curriculum to address the disparities linked to school type, location and guardian education,

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4. while school administrators and teachers provide regular computer-based practice and pursue continuous professional development in ICT-supported instruction, and parents and communities support study habits and access to digital resources, particularly for disadvantaged students.
5. Educational planners should draw on historical UTME performance data for forecasting and evidence-based policy development, while recognising its moderate explanatory power relative to individual-level predictors.
6. Future research should use nationally representative samples, multilevel models, within-institution and differential-prediction analyses, and comparisons of UTME with WAEC, NECO and NABTEB results, extended to all six South-west geopolitical states.

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Conflict of Interest Statement

The authors declare that they have no competing interests.

Data Availability Statement

The data supporting the findings of this study are held by the Joint Admissions and Matriculation Board (JAMB) and the participating universities. Because the dataset contains examination and educational records subject to institutional restrictions, individual-level data are not publicly available. Aggregated or fully de-identified data may be made available by the corresponding author on reasonable request, subject to the necessary permissions.

Ethical Approval Statement

Ethical approval was obtained from the Emmanuel Alayande University of Education Research Ethics Committee (Approval No. EAUED/ERC/2024/018). Permission to access records was obtained from JAMB and the participating universities. Questionnaire and interview participants gave informed consent.

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