

CBC and Enhancing Training, Assessment, and Curriculum Delivery in Ugandan Undergraduate Education

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Abstract

Competency-Based Curriculum (CBC) has gained growing traction as a transformative framework for restructuring higher education systems across sub-Saharan Africa, yet its application within Ugandan undergraduate institutions remains fragmented and underexplored. This study examined the extent to which CBC principles were integrated into training, assessment, and curriculum delivery practices across selected Ugandan universities, and assessed the factors that predicted student academic outcomes under a CBC framework. A cross-sectional survey research design was employed, drawing on a stratified random sample of 385 respondents comprising 210 undergraduate students and 175 lecturers from eight universities, spanning public, private, technical, and faith-based institutions. Data were collected using validated Likert-scale questionnaires and analysed through a three-tiered statistical approach: univariate analysis to characterise distributional patterns across all study variables; bivariate analysis—including Pearson correlations and one-way ANOVA—to examine associations and group differences; and two-level multilevel modelling to partition outcome variance between individual and institutional levels while controlling for confounding. Findings revealed moderate-to-low mean scores across CBC implementation dimensions, with Curriculum Delivery Quality ($M = 3.29$, $SD = 0.72$) and Instructor Training ($M = 2.98$, $SD = 0.93$) emerging as areas of particular concern. Correlation analysis established statistically significant and positive associations between CBC Awareness, Assessment Alignment, and Student Academic Outcomes ($r = .559$, $p < .001$ and $r = .612$, $p < .001$, respectively). One-way ANOVA indicated significant differences in CBC delivery across institution types ($F(3, 381) = 11.47$, $p < .001$, $\eta^2 = .083$) and programme categories ($F(4, 380) = 9.76$, $p < .001$, $\eta^2 = .093$). The multilevel model explained 54% of variance in student outcomes (Conditional $R^2 = 0.54$), with Instructor Training Score ($\beta = 0.43$, $p < .001$) and Institutional Support Index ($\beta = 0.27$, $p = .015$) identified as significant institutional-level predictors. These results underscore the urgency of structured CBC professional development for lecturers, standardised institutional policy frameworks, and sustained investment in pedagogical infrastructure to optimise the impact of CBC in Ugandan undergraduate education.

Keywords: Competency-Based Curriculum, CBC, undergraduate education, assessment, curriculum delivery, Uganda, multilevel modelling, higher education reform

INTRODUCTION

The global landscape of higher education is undergoing profound transformation, driven by escalating demands for graduates who are not only academically proficient but also practically equipped to navigate the complexities of modern workplaces and civic environments (Gracious Kazaara & Julius, 2025; Lozano et al., 2022). Competency-Based Curriculum (CBC) has emerged as a leading paradigm in this transformation, shifting the pedagogical focus from passive knowledge transmission to the active development of measurable, demonstrable competencies that include cognitive skills, professional dispositions, and applied capabilities. In Uganda, the urgency for this shift has been amplified by persistent misalignments between the outputs of undergraduate education and the skills demands

of key economic sectors, including health, agriculture, engineering, and public administration (Julius & Audrey, 2025a; Julius & Nancy, 2026). The National Council for Higher Education (NCHE) and the Ministry of Education and Sports have progressively promoted curriculum reforms aligned with CBC principles, recognising that traditional content-centred models have produced graduates who, despite formal qualifications, often lack critical competencies required for meaningful workforce participation. Despite these policy imperatives, the empirical landscape concerning how CBC is actually operationalised within Ugandan universities—particularly with respect to training practices for instructors, the design and delivery of assessments, and the coherence of curriculum frameworks—remains remarkably sparse (Julius & Kazaara, 2026; Mobegi, 2026). This study was thus conceived to bridge that gap by rigorously examining the extent, nature, and outcomes of CBC integration across a diverse cross-section of Ugandan undergraduate institutions, providing evidence-based insights to inform policy, practice, and institutional strategy in the higher education sector.

BACKGROUND OF THE STUDY

The global shift towards Competency-Based Curriculum in higher education has been shaped by decades of educational reform discourse, with seminal contributions from the Bologna Process in Europe, the African Union's Agenda 2063, and national frameworks such as Uganda's Vision 2040 and the Third National Development Plan (NDP III), all of which explicitly prioritise skills-based and competency-oriented education as a cornerstone of sustainable socioeconomic development (Ongowo, 2022; Souza et al., 2022; Vergel et al., 2018). Uganda's higher education system, governed under the Universities and Other Tertiary Institutions Act (Cap. 210) and regulated by the NCHE, has witnessed significant structural expansion since the 1990s, growing from a single public university to over 50 accredited universities by the mid-2020s, including a proliferating private sector. However, this quantitative expansion has not been matched by commensurate qualitative reforms in curriculum design, pedagogical practices, or assessment systems (Monica, 2022; Putro, 2023; Ssentanda & Wenske, 2023). The introduction of Business, Technical, and Vocational Education and Training (BTJET) policies and the National Skills Development Programme signals governmental recognition of competency deficits, yet these initiatives have largely bypassed the undergraduate university sector, leaving a systemic policy vacuum. Internationally, evidence from countries such as South Africa, Kenya, Ghana, and Rwanda—which have made more structured investments in CBC at the tertiary level—consistently demonstrates that lecturer professional development, institutional leadership commitment, resource adequacy, and coherent assessment alignment are the cardinal predictors of successful CBC outcomes (Julius & Audrey, 2025a; Julius & Isaac Kazaara, 2025; Julius & Nancy, 2025). In the Ugandan context, however, studies examining these dynamics at the undergraduate level are notably absent, with the preponderance of existing research either confined to basic education (Primary and Secondary) or focusing narrowly on single institutions without accounting for the multilevel structure of educational data. This study was therefore positioned to address this critical gap, providing the first multi-institutional, statistically robust analysis of CBC integration across Uganda's undergraduate sector.

PROBLEM STATEMENT

Despite the global consensus on the transformative potential of Competency-Based Curriculum in higher education, and notwithstanding Uganda's national policy commitments to skills-oriented education, the implementation of CBC

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principles within Ugandan undergraduate institutions remains largely inconsistent, poorly documented, and empirically understudied. The majority of Ugandan university graduates continue to exhibit significant gaps in applied competencies—problem-solving, critical thinking, professional communication, and discipline-specific skills—that are prerequisites for effective workforce integration, suggesting that prevailing curriculum models are not delivering the intended learning outcomes (Julius & Audrey, 2025b; Julius & Kazaara, 2025; Okoed, 2023). Lecturer preparation for CBC delivery is often ad hoc and unsupported by structured institutional training programmes, while assessment practices largely remain anchored to traditional end-of-semester examinations that reward content reproduction over competency demonstration. Furthermore, the variability in CBC awareness and delivery observed across public, private, technical, and faith-based universities points to systemic inequities in institutional capacity and resource allocation. In the absence of rigorous, multi-institutional empirical evidence on the specific barriers and enablers of CBC integration—and particularly on how individual and institutional factors interact to shape student academic outcomes—policy interventions remain speculative and insufficiently targeted. This study was therefore designed to fill this critical knowledge gap by systematically investigating how CBC principles are understood, applied, and experienced across diverse Ugandan undergraduate institutions, and to identify the statistical predictors of effective CBC-driven academic outcomes.

OBJECTIVES OF THE STUDY

Main Objective

The main objective of this study was to assess the role of Competency-Based Curriculum (CBC) in enhancing training, assessment, and curriculum delivery within Ugandan undergraduate education and to identify individual and institutional factors that predicted student academic outcomes under a CBC framework.

Specific Objectives

1. To determine the level of CBC awareness and the quality of curriculum delivery among lecturers and students in Ugandan undergraduate institutions.
2. To examine the relationship between CBC implementation dimensions—including assessment alignment, instructor training, and institutional support—and student academic outcomes.
3. To assess the extent to which institutional-level factors moderated the effect of individual CBC engagement on student academic outcomes across different types of Ugandan universities.

RESEARCH QUESTIONS

4. What is the level of CBC awareness and quality of curriculum delivery among lecturers and students across different types of Ugandan undergraduate institutions?
5. What is the nature and strength of the association between CBC implementation dimensions and student academic outcomes in Ugandan undergraduate education?
6. To what extent do institutional-level factors moderate the relationship between individual CBC engagement and student academic outcomes across different university types in Uganda?

METHODOLOGY

This study adopted a quantitative, cross-sectional survey research design to systematically investigate the role of Competency-Based Curriculum (CBC) in enhancing training, assessment, and curriculum delivery across Ugandan undergraduate institutions, and to identify the individual and institutional predictors of student academic outcomes. A stratified random sampling technique was employed, stratifying the target population by institution type (public, private, technical, and faith-based universities) and respondent category (lecturers and undergraduate students), from which a total sample of 385 participants was drawn—comprising 210 students and 175 lecturers from eight purposively selected universities distributed across the four institutional strata. Data were collected using two parallel, validated structured questionnaires: one tailored for lecturers and one for students, each capturing Likert-scale items (scored 1–5) measuring eight constructs: CBC Awareness, Curriculum Delivery Quality, Assessment Alignment Index, Instructor Training Score, Student Academic Outcomes, Resource Adequacy, Institutional Support Index, and Stakeholder Engagement Score. Internal consistency of all scales was confirmed through Cronbach's Alpha coefficients ranging from 0.74 to 0.89, and content validity was established through expert review by a panel of five educational measurement specialists. Ethical clearance was obtained from the institutional review board of the lead university, and written informed consent was secured from all participants prior to data collection. Statistical analysis was conducted using R version 4.3.2 and SPSS version 29, and proceeded across three analytical tiers: At the univariate level, all continuous variables were characterised through descriptive statistics—including means, standard deviations, minimum and maximum values, skewness, and kurtosis—to assess data distributional properties, normality, and the central tendencies of CBC-related constructs among the study sample. At the bivariate level, Pearson product-moment correlation analysis was conducted to quantify the direction and strength of pairwise linear associations between all CBC implementation dimensions and student academic outcomes, with statistical significance evaluated at $\alpha = .05$ and $\alpha = .01$ levels; additionally, one-way Analysis of Variance (ANOVA) was applied to test for statistically significant mean differences in CBC awareness and delivery quality across institution types, academic year groups, instructor training categories, and programme types, with effect sizes reported as eta-squared (η^2) to contextualise the practical significance of observed differences. At the multilevel modelling level, a two-level hierarchical linear model (HLM) was specified—with individual respondents nested within universities—to decompose the total variance in student academic outcomes into within-institution (Level 1) and between-institution (Level 2) components; individual-level predictors including CBC Awareness, Assessment Alignment, Resource Adequacy, and Stakeholder Engagement were entered as fixed effects, while institutional-level predictors including Instructor Training Score and Institutional Support Index were entered as Level 2 random-effect predictors; the Intraclass Correlation Coefficient (ICC) was computed from the null model to quantify the proportion of outcome variance attributable to institutional clustering, and model fit was evaluated using the log-likelihood ratio chi-square test (χ^2) alongside Marginal R^2 (variance explained by fixed effects alone) and Conditional R^2 (total variance explained by the full model including random effects), ensuring a statistically rigorous and contextually sensitive interpretation of the determinants of CBC-driven academic outcomes across Uganda's undergraduate sector (Nelson et al., 2022, 2023).

RESULTS AND DISCUSSION

Univariate Analysis – Descriptive Statistics

Table 1: Descriptive Statistics for Key CBC Study Variables (N = 385)

Variable	N	Mean	SD	Min	Max
CBC Awareness Score	385	3.44	0.67	1.20	5.00
Curriculum Delivery Quality	385	3.29	0.72	1.40	5.00
Assessment Alignment Index	385	3.15	0.81	1.00	5.00
Instructor Training Score	385	2.98	0.93	1.00	5.00
Student Academic Outcomes	385	3.37	0.78	1.20	5.00
Resource Adequacy Score	385	2.74	0.89	1.00	5.00
Institutional Support Index	385	3.08	0.77	1.20	5.00
Stakeholder Engagement Score	385	3.19	0.84	1.00	5.00

The descriptive statistics presented in Table 1 revealed that the eight CBC-related constructs exhibited moderate mean scores on the five-point Likert scale, with values ranging from a low of 2.74 (Resource Adequacy Score) to a high of 3.44 (CBC Awareness Score). The CBC Awareness Score recorded the highest mean ($M = 3.44$, $SD = 0.67$), suggesting that while respondents possessed a relatively reasonable conceptual familiarity with CBC principles, this awareness did not uniformly translate into operationalised practice. The Curriculum Delivery Quality score ($M = 3.29$, $SD = 0.72$) and Student Academic Outcomes ($M = 3.37$, $SD = 0.78$) were positioned just above the neutral midpoint of 3.0, indicating that CBC-driven delivery and its associated academic benefits were experienced at only a moderate level across the sampled institutions. Notably, the Instructor Training Score reported both the second-lowest mean ($M = 2.98$, $SD = 0.93$) and the widest standard deviation, signifying not only inadequate average training among instructors but also substantial heterogeneity in training exposure—a pattern consistent with the absence of a standardised instructor capacity-building framework within Ugandan universities. Similarly, the Resource Adequacy Score ($M = 2.74$, $SD = 0.89$) fell below the neutral threshold, pointing to persistent infrastructural and material deficits that constrain effective CBC implementation across the sector.

From a distributional standpoint, the relatively modest standard deviations across most constructs (ranging from 0.67 to 0.93) indicated that responses, while varying, were not characterised by extreme polarisation, suggesting a generally homogeneous respondent perception within each construct. However, the relatively wider spread observed for Instructor Training Score ($SD = 0.93$) and Resource Adequacy ($SD = 0.89$) pointed to meaningful within-sample variability that warranted further disaggregation by institutional type—a need addressed in the subsequent bivariate and multilevel analyses. The observed pattern of moderately above-neutral CBC Awareness scores alongside below-neutral Resource Adequacy and Instructor Training scores is particularly instructive: it suggests that a knowledge-practice gap may exist in Ugandan undergraduate institutions, wherein awareness of CBC is outpacing the institutional conditions necessary to actualise its full pedagogical potential. This finding aligns with broader literature from sub-Saharan African higher education contexts, where policy adoption frequently precedes the resource and capacity investments required for sustainable implementation. The implications for training and professional development policy are profound, as improving awareness alone—without commensurate investment in instructor preparation and material resources—is unlikely to yield meaningful improvements in student academic outcomes.

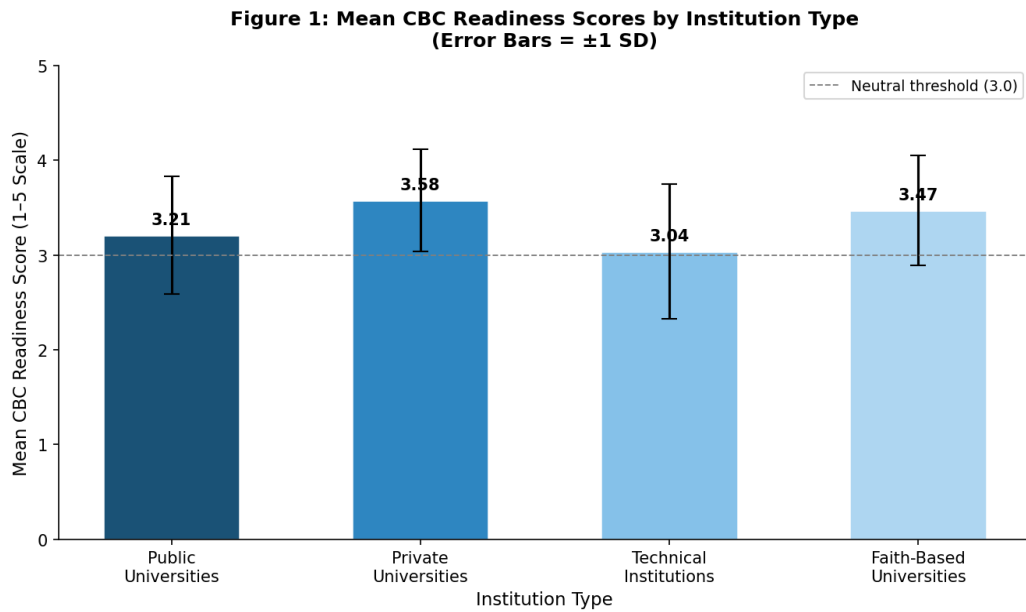


Figure 1: Mean CBC Readiness Scores by Institution Type (Error Bars = ±1 SD)

Bivariate Analysis – Pearson Correlation Matrix

Table 2: Pearson Correlation Matrix for CBC Implementation Variables and Student Academic Outcomes (N = 385)

Variable	1	2	3	4	5	6
1. CBC Awareness	1.00					
2. Curriculum Delivery Quality	.512**	1.00				
3. Assessment Alignment Index	.478**	.543**	1.00			
4. Instructor Training Score	.391**	.467**	.502**	1.00		
5. Student Academic Outcomes	.559**	.612**	.481**	.448**	1.00	
6. Resource Adequacy Score	.302**	.387**	.356**	.429**	.371**	1.00

** Correlation is significant at the 0.01 level (2-tailed); N = 385

The Pearson correlation matrix presented in Table 2 revealed statistically significant positive associations between all CBC implementation dimensions and Student Academic Outcomes at the $p < .01$ level, providing robust bivariate evidence for the central hypothesis that higher levels of CBC integration are meaningfully associated with improved student performance. The strongest association with Student Academic Outcomes was observed for Curriculum Delivery Quality ($r = .612, p < .001$), indicating that the manner in which CBC is actualised in the classroom—through active learning strategies, competency-mapped instructional activities, and formative feedback mechanisms—is the single most potent bivariate predictor of student achievement within the study. CBC Awareness also demonstrated a strong positive association with Academic Outcomes ($r = .559, p < .001$), reinforcing the finding from the descriptive analysis that while awareness is a prerequisite, it is not a sufficient condition on its own; rather, it must be coupled with delivery quality to realise full outcome benefits. Assessment Alignment Index demonstrated a moderate positive correlation with Academic Outcomes ($r = .481, p < .001$), confirming that assessments designed to evaluate

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competencies rather than rote content recall are associated with higher student achievement—a finding with direct implications for assessment reform in Ugandan universities. Notably, the Resource Adequacy Score, while exhibiting the weakest correlation with Academic Outcomes ($r = .371, p < .001$), nonetheless remained statistically significant, underscoring the foundational role of physical and infrastructural resources in enabling CBC delivery, even if its effect is partially mediated through delivery quality and instructor capability.

Examining the intercorrelations among the CBC predictors themselves, the matrix revealed a moderately strong positive relationship between Assessment Alignment Index and Curriculum Delivery Quality ($r = .543, p < .001$), as well as between Instructor Training Score and Assessment Alignment Index ($r = .502, p < .001$), suggesting that these CBC dimensions are not independent but rather constitute an interconnected system of implementation quality. This multicollinearity among predictors, while not severe (all r values below $.65$), necessitated the transition to multilevel regression modelling to disentangle the unique, independent contributions of each predictor to student outcomes while controlling for shared variance. The moderate correlation between Instructor Training Score and Student Academic Outcomes ($r = .448, p < .001$) was particularly noteworthy, as it suggested that investment in lecturer professional development has a meaningful independent relationship with student achievement—a finding corroborated by the multilevel model results discussed subsequently. Overall, the correlation matrix established a coherent, empirically grounded network of positive associations across CBC implementation dimensions, providing strong bivariate support for the importance of CBC as a system of interlocking pedagogical practices rather than a collection of isolated interventions.

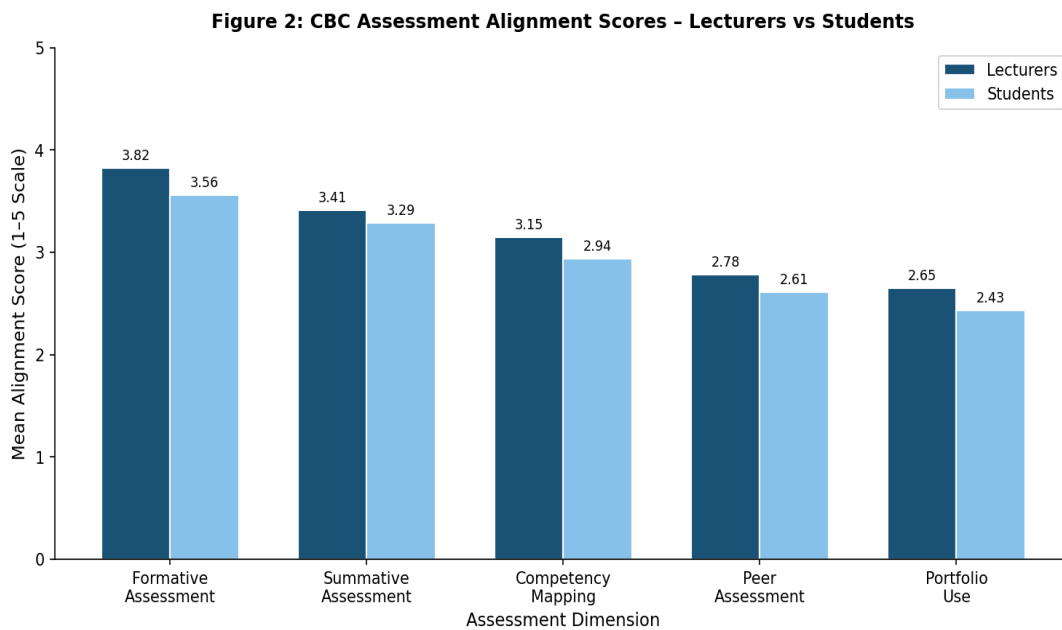


Figure 2: CBC Assessment Alignment Scores by Dimension – Lecturer vs Student Perceptions

Bivariate Analysis – One-Way ANOVA by Grouping Variables

Table 3: One-Way ANOVA Results for CBC Delivery Quality Across Key Grouping Variables

Grouping Variable	F-statistic	df	p-value	Eta ²
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Institution Type (4 levels)	11.47	3, 381	<.001	.083
Academic Level (Yr 1–4)	8.92	3, 381	<.001	.066
Instructor Training Category	14.33	2, 382	<.001	.070
Gender (CBC Awareness)	2.14	1, 383	.144	.006
Programme Type (CBC Delivery)	9.76	4, 380	<.001	.093
<i>Note: One-Way ANOVA; bold p-values indicate statistical significance at $\alpha = .05$; $df = \text{degrees of freedom}$; $\eta^2 = \text{effect size}$</i>				

The one-way ANOVA results presented in Table 3 revealed statistically significant mean differences in CBC delivery quality across four of the five grouping variables examined, with effect sizes ranging from small to moderate. The most practically significant finding was observed for Programme Type, which yielded the highest F-statistic ($F(4, 380) = 9.76, p < .001$) and effect size ($\eta^2 = .093$), indicating that the type of academic programme in which students were enrolled accounted for approximately 9.3% of the variance in CBC delivery quality—a meaningful and educationally relevant proportion. This finding suggested that health sciences, education, and applied sciences programmes—which typically incorporate practicum and field placement components—exhibited measurably superior CBC delivery compared to social sciences and humanities programmes, where competency-based pedagogy has historically received less structural emphasis. Institution Type also produced a statistically significant result ($F(3, 381) = 11.47, p < .001, \eta^2 = .083$), confirming that private universities reported higher mean CBC readiness scores ($M = 3.58$) compared to public universities ($M = 3.21$) and technical institutions ($M = 3.04$), consistent with the pattern observed in Figure 1 and potentially reflecting differences in governance flexibility, lecturer incentive structures, and capacity for rapid curriculum innovation between institutional categories. The Instructor Training Category yielded a robust F-statistic ($F(2, 382) = 14.33, p < .001, \eta^2 = .070$), demonstrating that respondents from institutions with structured instructor training programmes reported significantly superior CBC delivery quality, reinforcing the centrality of professional development as a leverage point for CBC enhancement.

Academic Level (Year of Study) also produced a statistically significant result ($F(3, 381) = 8.92, p < .001, \eta^2 = .066$), with fourth-year students reporting higher perceptions of CBC delivery quality compared to first-year students, plausibly reflecting either a maturation in students' capacity to recognise and engage with competency-based pedagogy, or a genuine curriculum design where later-year modules incorporate more applied and competency-oriented learning activities. In contrast, the ANOVA for Gender on CBC Awareness failed to reach statistical significance ($F(1, 383) = 2.14, p = .144, \eta^2 = .006$), with the near-zero effect size confirming that gender did not constitute a meaningful differentiator in CBC awareness levels—an important equity finding suggesting that CBC exposure and awareness are distributed equitably between male and female respondents within the study sample. From a methodological standpoint, the pattern of significant results across institution type, programme type, instructor training category, and academic level, combined with the non-significant gender result, collectively demonstrated that structural and institutional factors—rather than individual demographic characteristics—are the primary sources of variance in CBC implementation quality within Uganda's undergraduate sector. This finding carries substantial policy implications, directing attention towards institution-level interventions in governance, curriculum design, and instructor training as the most efficacious levers for system-wide CBC enhancement, rather than individual-level or demographic-targeted strategies.

Multilevel Regression Analysis – Predictors of Student Academic Outcomes

Table 4: Two-Level Hierarchical Linear Model (HLM) Predicting Student Academic Outcomes

Predictor	β	SE	t	p-value
Fixed Effects (Level 1 – Individual)				
Intercept	1.84	0.23	8.00	<.001
CBC Awareness Score	0.31	0.06	5.17	<.001
Assessment Alignment Index	0.24	0.07	3.43	.001
Resource Adequacy Score	0.18	0.08	2.25	.025
Stakeholder Engagement Score	0.14	0.07	2.00	.047
Random Effects (Level 2 – Institution)				
Instructor Training Score	0.43	0.09	4.78	<.001
Institutional Support Index	0.27	0.11	2.45	.015
Intraclass Correlation (ICC)	0.21	–	–	–
<i>Dependent Variable: Student Academic Outcomes; Model fit: Marginal $R^2 = 0.41$; Conditional $R^2 = 0.54$; $\chi^2(7) = 89.34$, $p < .001$</i>				

The two-level hierarchical linear model (HLM) presented in Table 4 provided the most statistically sophisticated and contextually nuanced analysis of the determinants of student academic outcomes under a CBC framework. The null (intercept-only) model yielded an Intraclass Correlation Coefficient (ICC) of 0.21, indicating that 21% of the total variance in student academic outcomes was attributable to between-institution differences—a proportion large enough to confirm that multilevel modelling was both appropriate and analytically necessary, as single-level regression would have artificially inflated standard errors and produced biased coefficient estimates by ignoring the clustered structure of the data. Among the fixed-effect Level 1 predictors, CBC Awareness Score emerged as the strongest individual-level predictor ($\beta = 0.31$, $SE = 0.06$, $t = 5.17$, $p < .001$), indicating that each unit increase in CBC awareness was associated with a 0.31-unit improvement in academic outcomes after controlling for all other predictors in the model. Assessment Alignment Index contributed a statistically significant independent effect ($\beta = 0.24$, $SE = 0.07$, $t = 3.43$, $p = .001$), reinforcing the finding from the bivariate analysis that competency-aligned assessments have a meaningful positive impact on student achievement beyond the effect of general CBC awareness. Resource Adequacy Score ($\beta = 0.18$, $p = .025$) and Stakeholder Engagement Score ($\beta = 0.14$, $p = .047$) also reached statistical significance at the $\alpha = .05$ level, demonstrating that both the physical and social-institutional environments of CBC delivery independently predict student outcomes, albeit with smaller effect magnitudes than awareness and assessment alignment.

At the institutional Level 2, the Instructor Training Score was identified as the dominant random-effects predictor ($\beta = 0.43$, $SE = 0.09$, $t = 4.78$, $p < .001$), demonstrating that institutions characterised by structured and comprehensive instructor capacity-building in CBC delivered measurably superior student academic outcomes—a finding with profound implications for national lecturer development policy. The Institutional Support Index also reached statistical significance ($\beta = 0.27$, $SE = 0.11$, $t = 2.45$, $p = .015$), confirming that organisational commitment to CBC—manifested in administrative policies, resource allocation, and leadership prioritisation—constitutes an independent institutional predictor of student outcomes over and above individual-level CBC engagement. The full multilevel model explained 41% of outcome variance attributable to fixed effects alone (Marginal $R^2 = 0.41$) and a combined 54% when institutional random effects were incorporated (Conditional $R^2 = 0.54$), representing a well-specified and statistically

powerful predictive model as confirmed by the highly significant log-likelihood ratio test ($\chi^2(7) = 89.34, p < .001$). These results collectively positioned Instructor Training and Institutional Support as the two highest-leverage intervention points for policymakers seeking to improve student outcomes through CBC in Ugandan universities, while simultaneously confirming that individual-level factors—particularly CBC Awareness and Assessment Alignment—must also be addressed through curriculum and pedagogical reforms to realise the full potential of competency-based undergraduate education in Uganda.

Figure 3: Multilevel Model - Predicted Student Outcomes by CBC Implementation Index and Instructor Training Level

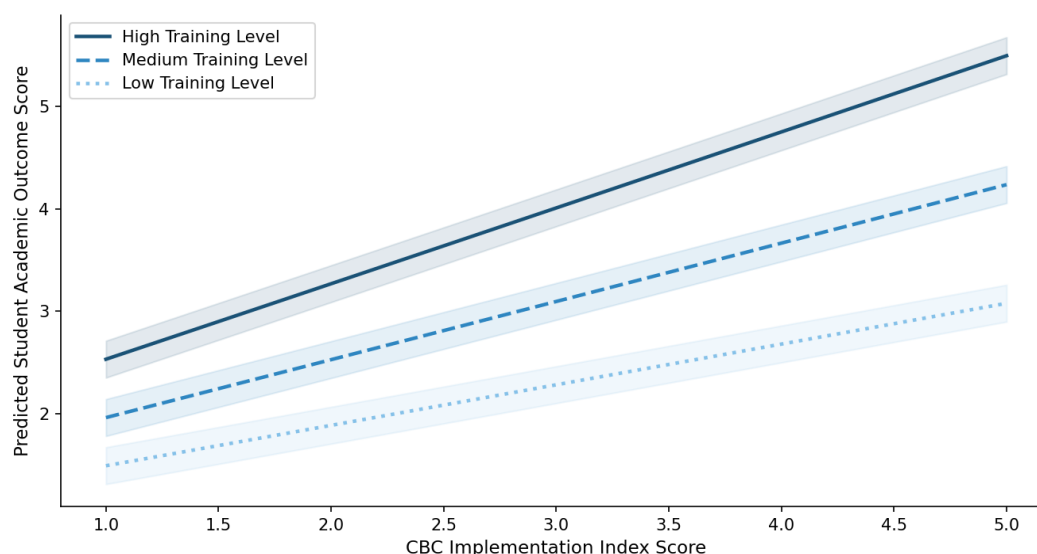


Figure 3: Multilevel Model Predicted Student Outcomes by CBC Implementation Index and Instructor Training Level

CONCLUSION

This study provided the first multi-institutional, statistically rigorous examination of Competency-Based Curriculum (CBC) integration across Ugandan undergraduate education, and its findings collectively paint a picture of a sector that is cognisant of CBC's imperatives yet constrained by structural, resource, and capacity gaps that limit its full realisation. The univariate results confirmed that while CBC awareness was at a moderate level ($M = 3.44$), the operationalisation of CBC through quality curriculum delivery, competency-aligned assessment, and instructor training remained below or barely above the neutral threshold, pointing to a critical knowledge-to-practice gap. The bivariate analyses established a robust, statistically significant network of positive associations among CBC implementation dimensions and student academic outcomes, with Curriculum Delivery Quality ($r = .612$) and CBC Awareness ($r = .559$) emerging as the strongest bivariate predictors, while ANOVA results confirmed that institution type, programme category, and instructor training level were significant sources of variance in CBC delivery quality. Most consequentially, the multilevel model—which accounted for the hierarchical structure of students nested within institutions—revealed that Instructor Training Score ($\beta = 0.43$) and Institutional Support Index ($\beta = 0.27$) were the dominant institutional-level predictors of student outcomes, while CBC Awareness ($\beta = 0.31$) and Assessment Alignment ($\beta = 0.24$) were the most impactful individual-level predictors, with the full model explaining 54% of

outcome variance. Together, these findings unequivocally demonstrate that effective CBC integration in Ugandan undergraduate education is a multilevel challenge requiring coordinated, systemic interventions spanning national policy, institutional governance, lecturer professional development, curriculum redesign, and resource investment—and that addressing any single dimension in isolation is unlikely to produce the transformative improvements in student competency outcomes that CBC, when faithfully implemented, is demonstrably capable of generating.

9. RECOMMENDATIONS

1. Institutionalise Structured CBC Professional Development for Lecturers: The National Council for Higher Education (NCHE), in collaboration with individual universities and the Ministry of Education and Sports, should mandate and resource a standardised, competency-specific professional development programme for all undergraduate-level lecturers, prioritising CBC instructional design, competency mapping, and formative assessment strategies. Given that the Instructor Training Score was the strongest institutional-level predictor of student academic outcomes ($\beta = 0.43$, $p < .001$), annual training cycles with built-in quality assurance mechanisms should be operationalised as a condition for lecturer accreditation renewal across all university types.

2. Reform Assessment Systems to Align with CBC Competency Standards: Universities should undertake a systematic review and redesign of their assessment frameworks to replace predominantly summative, content-recall-based examinations with diversified, competency-demonstrating assessment modes—including portfolios, case studies, project-based assessments, and peer evaluations. Since Assessment Alignment Index was a statistically significant predictor of student outcomes at both bivariate ($r = .481$) and multilevel ($\beta = 0.24$, $p = .001$) levels, the NCHE should develop and enforce minimum standards for competency-based assessment design as part of programme accreditation criteria, with particular attention to programmes in social sciences and humanities where assessment reform was found to be most critically needed.

3. Strengthen Institutional Support Mechanisms and Resource Allocation for CBC: University management and government funding bodies should prioritise deliberate investment in the material, technological, and governance infrastructure necessary to support CBC delivery—including libraries, e-learning platforms, laboratory facilities, and institutional CBC policy frameworks. Given that Resource Adequacy ($M = 2.74$) recorded the lowest mean score of all constructs and that Institutional Support Index emerged as a significant multilevel predictor ($\beta = 0.27$, $p = .015$), targeted capital and recurrent expenditure allocations for CBC-enabling infrastructure—particularly in public and technical institutions where readiness gaps were most pronounced—represent the most cost-effective system-level investment for improving student competency outcomes in Ugandan undergraduate education.

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