Pedagogical Reform Implementation and Competence-Based Education and Training Adoption Readiness among Public Universities in Northern Uganda: The Moderating Role of Supportive Resources

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Abstract

This study focused on the influence of pedagogical reform implementation on competence-based education and training adoption readiness among public universities in Northern Uganda while considering the moderating role of supportive resources. The specific objectives of the study were to examine the relationship between pedagogical reform implementation and competence-based education and training (CBET) adoption readiness among public universities in Northern Uganda; to establish the relationship between supportive resources and competence-based education and training adoption readiness among public universities in Northern Uganda; and to determine the moderating effect of supportive resources on the relationship between pedagogical reform implementation and competence-based education and training adoption readiness among public universities in Northern Uganda. Primary data was collected using a structured questionnaire, in which 243 staff members responded out of a sample size of 433 across different staff categories. The study adopted a cross-sectional survey design. The collected data was examined using the Statistical Package for the Social Sciences (SPSS) version 26. The results showed a positive correlation between

pedagogical reform implementation and CBET adoption readiness. Furthermore, the results showed that supportive resources and CBET adoption readiness are positively correlated. The regression result revealed that supportive resources significantly enhanced CBET adoption readiness, while pedagogical reform implementation had no significant effect, and the moderation analysis revealed that supportive resources significantly moderated the relationship between pedagogical reform implementation and CBET adoption readiness ($\Delta R^2 = 0.0254$, $F = 7.0794$, $p = .0083$). Thus, based on these results, increasing CBET adoption readiness among public universities in Northern Uganda requires pedagogical reform implementation strengthened by supportive resources. The study, therefore, recommends that these universities institutionalise these reforms through **departmental teaching policies.** The **NCHE** should, thus, organise national symposia, training workshops and benchmarking tours for lecturers and administrators across public universities. The Ministry of Education and Sports (**MoES**) should increase funding allocations for the implementation of the competence-based education and training, among other measures.

Keywords: *Pedagogical reform implementation; Supportive resources; competence-based education and training; Adoption readiness; Uganda.*

Introduction

Education systems globally are undergoing significant transformation to meet the demands of the 21st century, characterised by rapid technological advancement, dynamic labour market needs, and the growing emphasis on competence-based learning (Zou *et al*., 2025). As a response, many countries have embraced the competence-based education and training (CBET) model, which focuses on developing learners' skills, knowledge, and attitudes necessary for problem-solving and innovation (Serdenciuc, 2013). In Uganda, the adoption of the CBET has been prioritised as part of the broader educational reform agenda aimed at enhancing the relevance and quality of education from basic to higher education levels. In this connection, in July 2025, the Minister of Education and Sports, Janet K. Museveni, issued a directive mandating that this transition begins in the 2027/2028 academic year in public universities, coinciding with the arrival of the first cohort of students who completed their

A-Levels under the new secondary curriculum (Uganda Radio Network, 2025) . A competency-based curriculum therefore emphasises what learners are expected to do rather than what they are expected to know (Nakabugo, Bisaso, & Masembe, 2011). The successful implementation of CBET requires that universities, especially public institutions, adopt pedagogical reforms that align with competence-based principles. These reforms include learner-centred teaching approaches, outcome-based assessment, integration of digital technologies, and continuous professional development for academic staff (National Curriculum Development Centre [NCDC], 2020).

However, several studies suggest that public universities in Uganda face challenges in aligning their pedagogical practices with the CBET framework, resulting in varying degrees of **adoption readiness** among institutions and faculty members as only a few public universities have trained facilitators on CBET implementation across limited faculties (Owuor, 2022; Kasozi, 2021). Adoption readiness refers to the extent to which an institution is prepared and willing to implement a new curriculum or innovation effectively.

While pedagogical reforms are essential in shaping adoption readiness, the impact of these reforms may not be uniform across all institutions. This variation often depends on the availability of **supportive resources**, including teaching materials, ICT infrastructure, funding, and administrative support, which can either facilitate or hinder the implementation of CBET-aligned practices (Sajan, 2017**).** The **moderating role of supportive resources** is, therefore, crucial in understanding the relationship between pedagogical reforms and adoption readiness.

Universities with adequate resources are more likely to implement innovative teaching methods and align with CBET principles. According to MacLellan (2019), Northern Uganda presents a unique context due to its history of educational disruption, resource limitations and ongoing recovery efforts. In addition, adoption readiness of CBET is still very low among public universities in Northern Uganda, at only 20%, with only a few facilitators trained in the employment of the CBET.

Previous studies, such as those by Mugizi (2023) and by Tumwebaze and Okech (2022), have highlighted that institutional support systems

significantly influence the effectiveness of educational reforms, yet empirical evidence specifically addressing this moderating relationship in the context of public universities in Northern Uganda remains scarce. Our study therefore adopts a quantitative research approach, with the purpose of examining the effect of pedagogical reform implementation on CBET adoption readiness among public universities in Northern Uganda, while considering the moderating role of supportive resources. The study aimed to achieve the following objectives:

(i) To examine the relationship between pedagogical reform implementation and competence-based education and training adoption readiness among public universities in Northern Uganda.

(ii) To establish the relationship between supportive resources and competence-based education and training adoption readiness among public universities in Northern Uganda.

(iii) To determine the moderating effect of supportive resources on the relationship between pedagogical reform implementation and competence-based education and training adoption readiness among public universities in Northern Uganda.

Literature Review

Theoretical underpinning

This quantitative study was underpinned by Rogers' Diffusion of Innovation Theory (DOI) (2003). According to Rogers (2003, p. 5), diffusion is "the process by which an innovation is communicated through certain channels over time among the members of a social system". He proposed core elements that affect diffusion such as innovation, communication channels, time, and social system (p.13). The theory has since been used extensively by researchers to explain educational changes in a variety of contexts. Boland (2020) investigated how social networks and peer influence (early adopters, change agents) aid the diffusion of a Learning Management System (LMS) and found that social networks greatly diffuse the learning management system; while Ajani (2024) applied the diffusion of the innovations framework to study digital transformation in African higher education and found that institutional strategies and infrastructure significantly influence the adoption process. Therefore,

this study relates to Rogers' DOI Theory because it holistically captures how innovations, such as the CBET, spread, the influence of reform characteristics such as the pedagogical reforms in diffusing the innovation, and the moderating role of supportive resources acting as a social system to support the diffusion of the educational change. Furthermore, Rogers' theory posits that the adoption readiness of the CBET in public universities in Northern Uganda is shaped by faculty perceptions of the relative advantage, compatibility, complexity, trialability, and observability of pedagogical reforms implementation. Supportive resources serve as a moderating factor, reinforcing positive perceptions and reducing barriers to adoption.

Review of Related Literature

In response to the growing scholarly interest in examining the effect of pedagogical reform implementation on CBET adoption readiness among public universities in Northern Uganda, particularly considering the moderating role of supportive resources, a number of empirical studies have been conducted globally. This section reviews relevant empirical literature to establish the current state of knowledge, identify existing gaps, and position the present study within the broader academic discourse. Below is the literature review reorganised and analytically aligned to the three specific study objectives:

Pedagogical reform implementation and competence-based education and training adoption readiness among public universities in Northern Uganda

The global shift toward competence-based education and training (CBET) has necessitated not only structural curriculum reforms but also the adoption of innovative pedagogical approaches that directly influence institutional readiness for implementation. Evidence suggests that pedagogical reforms such as project-based learning, community-based learning, augmented reality, and flipped classrooms play a critical role in shaping educators' preparedness and willingness to adopt competence-based curricula. In a United States university case study, Collins (2024) found that CBET adoption significantly restructures academic workload and increases reliance on administrative and technological systems, creating an environment where flexible and student-centred pedagogies

such as flipped classrooms become essential. These approaches enable continuous engagement and self-paced learning, which align closely with competency-based principles. However, the study emphasises that without clearly defined assessment frameworks, the effectiveness of such pedagogical innovations in supporting CBET may be limited.

Within the Ugandan context, Bogere et al. (2024) examined the implementation of the Enhancing Quality in Undergraduate Education through Innovative Pedagogy (EQUIP) initiative at Makerere University and established that learner-centred strategies, including community-based learning and practical, project-oriented tasks, significantly enhanced students' clinical competencies. These findings indicate that experiential and context-driven pedagogies strengthen adoption readiness by aligning teaching practices with real-world skill application. Nonetheless, the study highlights that successful integration depends on sustained faculty development, availability of practical assessment tools, and strong institutional support systems. Similarly, Atibuni (2024) reported moderate levels of acceptance of the CBET among teacher educators, but identified gaps in pedagogical training, particularly in implementing innovative approaches such as project-based learning and technology-enhanced methods, for instance augmented reality. This suggests that educators' familiarity and confidence in applying these pedagogical reforms are key determinants of adoption readiness. From an international perspective, Harden (2023) argues that outcome-based education reforms are most effective when supported by active learning strategies such as project-based learning and authentic assessment, both of which promote deeper engagement and competence acquisition. In the same vein, Mulder (2023) contends that without integrating innovative pedagogies, curriculum reforms risk remaining superficial, as traditional lecture-based methods do not adequately support competency development. Emerging technologies such as augmented reality further enhance this process by providing immersive, interactive learning experiences that bridge theory and practice, thereby fostering both student engagement and instructor readiness to adopt CBE. Collectively, these studies suggest that pedagogical reforms are not merely complementary to competence-based curricula but are central to their successful adoption. They influence educators' readiness by

enhancing instructional effectiveness, improving student engagement, and aligning assessment with competency outcomes. However, despite this recognition, there remains limited empirical evidence specifically examining how distinct pedagogical approaches such as project-based learning, community-based learning, augmented reality, and flipped classrooms individually and collectively impact adoption readiness within public universities in Northern Uganda. This gap underscores the need for context-specific research to better understand the pedagogical drivers of CBET implementation in such settings.

A review of existing literature shows important gaps in studies on CBET adoption. Collins (2024) provides useful insights into institutional transformation through CBE, but the study was conducted in a developed-country context and does not empirically examine the direct relationship between pedagogical reforms and adoption readiness. In addition, the study does not specifically analyse the contribution of innovative teaching approaches. Similarly, Bogere et al. (2024) examined the integration of EQUIP competency-based training at Makerere University and provided findings relevant to Uganda. However, the study focused only on one institution and one discipline, namely clinical education. Furthermore, the study mainly used qualitative and descriptive methods and did not apply strong statistical analysis or compare findings across institutions to determine how pedagogical reforms influence adoption readiness. These gaps create the need for broader and more rigorous empirical research in Ugandan universities.

Supportive resources and competence-based education and training Adoption readiness among public universities in Northern Uganda

Supportive resources are a central determinant of adoption readiness for CBET reforms, as they directly influence institutions' capacity to implement and sustain pedagogical and assessment changes. Reports from the National Council for Higher Education (NCHE) (2024–2025), drawing on reviews of institutions such as Makerere University, Uganda Christian University, International University of East Africa, Kampala International University, and Mountains of the Moon University, indicate that universities have undertaken capacity-building programmes and

curriculum reviews to align with the national CBET framework. These reports identify faculty training, assessment alignment, infrastructure adequacy, and funding sustainability as critical resource-based factors that shape institutional readiness. Similarly, UNESCO (2024) observes that across sub-Saharan Africa, adoption readiness for competency-based reforms is strongly dependent on the availability of digital infrastructure, staff capacity, and sustained financial investment, underscoring the role of resources in enabling effective implementation. In the Ugandan context, Otaala and Wasike (2023) further highlight that disparities in resource distribution across regions significantly affect implementation effectiveness, particularly in emerging public universities where infrastructural and human resource limitations are more pronounced. Recent empirical studies reinforce this relationship between resource availability and CBET adoption readiness. For instance, Kintu and Nalubega (2024) found that access to digital learning technologies, continuous professional development, and institutional funding significantly predicted lecturers' readiness to adopt competency-based approaches in East African universities. Likewise, Nabayego et al. (2023) established that universities with well-developed learning infrastructure and structured staff support systems demonstrated higher levels of preparedness and successful integration of CBET reforms compared to resource-constrained institutions. These findings collectively suggest that adequate and well-distributed resources are not only supportive but essential drivers of CBET adoption readiness. However, despite this growing body of evidence, there remains limited empirical assessment of the level and distribution of supportive resources in public universities in Northern Uganda, where infrastructural deficits and human resource constraints may differ significantly from those in more established institutions in central Uganda.

A review of existing literature shows several gaps in studies on CBET implementation and supportive resources. The NCHE (2024–2025) provides national-level information on CBET progress in Ugandan universities, but the findings are generalised and do not clearly show regional differences, especially in Northern Uganda. In addition, the study does not quantitatively assess the availability of supportive resources. Likewise, UNESCO (2024) discusses CBET reforms across sub-Saharan

Africa from a broad policy perspective, but it lacks institution-specific and regional empirical evidence within Uganda. Therefore, previous studies have not adequately explained how supportive resources influence CBET adoption readiness in the specific context of Northern Uganda, creating the need for localised and data-driven research.

Moderating effect of supportive resources on the relationship between pedagogical reform implementation and competence-based education and training adoption readiness among public universities in Northern Uganda

Although prior research recognises the importance of supportive resources in CBET implementation, there is a notable scarcity of studies employing hierarchical regression analysis to examine their moderating influence on adoption readiness. For instance, Collins (2024) underscores the role of administrative and information technology systems in facilitating CBET adoption but does not utilise hierarchical regression to test how these resources interact with pedagogical innovations. Similarly, Bogere et al. (2024) and Atibuni (2024) highlight faculty development and institutional support as critical enablers; however, their analyses remain largely descriptive and do not apply multivariate techniques such as hierarchical regression to establish interaction effects. While Kintu and Zhu (2023) provide empirical evidence that technological infrastructure enhances the effectiveness of innovative pedagogies in African universities, suggesting a potential moderating role, the study stops short of explicitly modelling this relationship through hierarchical regression procedures. In the same vein, Mulder (2023) emphasises the importance of institutional governance and resource alignment in strengthening curriculum reform outcomes but does not statistically test moderation effects. Consequently, the existing literature reveals a methodological gap, with limited application of hierarchical regression approaches to determine whether supportive resources such as skilled educators, adequate classroom facilities, digital tools, and financial capacity moderate the relationship between pedagogical reforms and CBET adoption readiness, particularly within public universities in Northern Uganda. A review of existing literature reveals important methodological and contextual gaps in studies on CBET adoption. Kintu and Zhu examined technology integration and innovative pedagogy

in African universities and suggested that infrastructural capacity could influence CBET adoption readiness. However, the study did not statistically test moderation or interaction effects. Similarly, Mulder discussed policy alignment and institutional governance in CBET from a theoretical perspective, but did not provide empirical analysis of moderation effects, particularly in Ugandan higher education institutions. Therefore, previous studies have not adequately examined how supportive resources interact with pedagogical reforms to influence CBET adoption readiness, creating the need for more rigorous and context-specific empirical research.

In conclusion, the reviewed literature reveals clear conceptual, contextual, and methodological gaps, particularly the limited use of empirical and advanced statistical approaches to examine how pedagogical reforms interact with supportive resources in shaping adoption readiness for CBET. Existing studies remain largely descriptive, theoretically oriented, or contextually broad, with insufficient focus on region-specific dynamics such as those in Northern Uganda. Consequently, this study is justified in seeking to generate empirically grounded and context-sensitive evidence on the interplay between pedagogical innovations and institutional resource capacity. By doing so, it aims to bridge the gap between theory and practice and provide actionable insights to university leaders and curriculum planners to support more effective, equitable, and evidence-based implementation of CBET within Uganda's higher education system.

Methodology

Research design

This study adopted a cross-sectional research design, which was considered appropriate because it allows the researcher to collect data from a large and diverse sample at a single point in time without the need for repeated contact with respondents (Amin, 2005; Sekaran, 2003). A quantitative research approach was employed to facilitate the collection of data that is measurable and amenable to statistical analysis,

thereby enabling objective evaluation of the research variables (Mugenda & Mugenda, 1999).

Target population, sampling method, and sample size

In this study, the unit of analysis is the three public universities in Northern Uganda, namely Gulu University, Lira University and Muni University. The **unit of inquiry,** however, comprises the individual staff members within these institutions, specifically vice chancellors, heads of departments and academic staff. Accordingly, the target population consists of vice chancellors, heads of departments and academic staff employed at the three aforementioned public universities in Northern Uganda (New Vision, 2022). The study employed census sampling to include all vice chancellors of the universities. These individuals are responsible for providing strategic leadership, approving institutional policies, and allocating resources for the implementation of the CBET. Census sampling was considered appropriate because the target population was relatively small and finite, and including all members ensures comprehensive coverage. Simple random sampling was used for heads of departments because they are homogeneous in all the three universities and perform similar roles – in this case leading faculty-level curriculum design and delivery, coordinating faculty or departmental training, and ensuring teaching staff adopt CBET methods. The stratified sampling method was employed for academic staff to ensure representation across all categories of the staff (Howell et al., 2020). The sample sizes were determined using the table for sample determination by Krejcie and Morgan (1970). Below is a table showing the breakdown of the population, sample size and sampling techniques.

Table 1: *Population and sample breakdown*

Categories	Specific categories	Gulu University	Lira University	Muni University	Target population			Sample size			Sampling technique used
Vice chancellors	Vice chancellor	1	1	1	3			1	1	1	Census
Middle-level management	Heads of department	53	12	14	53	12	14	46	11	13	Simple random sampling
Academic staff	–Professors	31	9	10	31	9	10	29	9	10	Stratified sampling method
	–Senior lecturers	41	14	18	41	14	18	37	13	17	
	–Lecturers	90	10	60	90	10	60	73	10	52	
	–Assistant lecturers	44	10	53	44	10	53	39	10	46	
	–Teaching assistants	3	5	7	3	5	7	3	5	7	

Measurements of the variables

To ensure clarity, transparency, and replicability, the study operationalised and measured each variable using established indicators from prior literature. Pedagogical reform implementation, supportive resources, and CBET adoption readiness were measured using validated constructs to provide empirical grounding for subsequent quantitative analyses (Amin, 2005; Mugenda & Mugenda, 2003; Sekaran & Bougie, 2016). Pedagogical reform implementation was operationalised using indicators such as project-based work, community-based learning, flipped classrooms, and augmented reality, as identified in prior studies (Sánchez-García & Reyes-de-Cózar, 2025; Campos-Mesa et al., 2022). Supportive resources, considered as a moderating variable, were measured through skilled educators, visionary leadership, digital infrastructure, and spacious classrooms (Baloch et al., 2024). CBET adoption readiness was measured using skill-focusedness, learner-centredness, application-based assessment, and knowledge transfer (Kachope, Nyakato, & Mwesigye, 2025).

Data collection instrument

To obtain the required data for this study, a structured self-administered questionnaire was employed. This instrument was considered appropriate because it allows for systematic data collection from a large number of respondents while minimising researcher bias and ensuring respondent anonymity. The questionnaire comprised closed-ended items, anchored in a five-point Likert scale ranging from 1 to 5, where 1 represented "strongly disagree", 2 "disagree", 3 "neutral/not sure", 4 "agree", and 5 "strongly agree". The questionnaire was designed to capture information on all key study variables, including pedagogical reform implementation, supportive resources, and CBET adoption readiness. To ensure clarity, the items were adapted from validated scales used in previous studies and tailored to the context of public universities in Northern Uganda.

Table 2: Validity results

Variable	Total number of items	Number of items valid	Content Validity Index
Pedagogical reform implementation	13	10	.769
Supportive resources	15	12	.800
Competence-based education and training	14	11	.786

Source: Primary data

The results in Table 2 indicate a validity outcome of above 0.7 for each of the variable measures, indicating that the test items are valid and fit for use in the current study.

Table 3: Reliability results

Variable	Number of items	Cronbach's alpha
Pedagogical reforms	10	.7.13
Supportive resources	12	.735
Competence-based education and training	11	.716

Source: Primary data

As indicated in Table 3, the researcher used SPSS to determine Cronbach's alpha, for which all scales' alpha reliabilities (α) exceeded the 0.7 (Nunnally, 1987) threshold point to satisfy acceptable research criteria. This implies that all variable test items are reliable since their Cronbach's alpha statistics for all the variables are above the 0.7 threshold.

Ethical consideration

The study was based on respect, informed consent and assured confidentiality of the participants. A copy of the introductory letter from the Department of Marketing and Management, Makerere University Business School, Regional Campus Arua was obtained for personal identification and data collection, respectively.

Data analysis

First, a **descriptive analysis** of the respondents' demographic characteristics was conducted. Second, Exploratory Factor Analysis **(EFA)** was performed using **SPSS**. Third, Confirmatory Factor Analysis **(CFA)** was undertaken to determine the dimensionality of the constructs and to confirm the underlying factor structures for subsequent structural analyses. Finally, **correlation and regression analyses** were conducted to examine the strength, direction, and predictive power of the variables.

Results

Data from 243 respondents in public universities in Northern Uganda were analysed. Table 4 presents significant positive correlations among the variables. Table 5 shows that supportive resources significantly predict CBET adoption readiness, while pedagogical reform implementation does not. Table 6 confirms that supportive resources significantly moderate the relationship between pedagogical reform implementation and adoption readiness, as seen below:

Table 4: *Pearson correlation results (N = 243)*

Variables	Pedagogical reform implementation	Supportive resources	CBET adoption readiness
CBET adoption readiness	0.236** (p = 0.000)	0.331** (p = 0.000)	1.000
Pedagogical reform implementation	1.000	0.497** (p = 0.000)	0.236** (p = 0.000)
Supportive resources (moderator)	0.497** (p = 0.000)	1.000	0.331** (p = 0.000)

Source: Primary data

Correlation is significant at the 0.01 level (2-tailed). *p-values reported as 0.000 indicate p < 0.001.*

The Pearson correlation analysis reveals statistically significant positive relationships among all study variables. First, there is a positive and significant relationship between pedagogical reform implementation and CBET adoption readiness *($r = 0.236$, $p < 0.001$)*. This indicates that improvements in pedagogical reforms are associated with increased readiness for adopting the CBET among public universities in Northern Uganda. However, the strength of this relationship is weak, suggesting that pedagogical reform implementation alone has a limited direct influence. Second, the findings show a moderate positive and significant relationship between supportive resources and CBET adoption readiness *($r = 0.331$, $p < 0.001$)*. This implies that increased availability of supportive resources, such as infrastructure, training, and funding, is associated with higher levels of adoption readiness. Additionally, there is a moderate positive relationship between pedagogical reform implementation and supportive resources *($r = 0.497$, $p < 0.001$)*, suggesting that institutions implementing pedagogical reforms are also likely to have better supportive resources in place. Overall, the results demonstrate that while both pedagogical reform implementation and supportive resources are important, supportive resources show a relatively stronger association with CBET adoption readiness, highlighting their critical role in facilitating successful curriculum implementation.

Table 5: *Multiple regression results for pedagogical reform implementation, supportive resources and CBET adoption readiness*

Model	Predictor	Unstandardised coefficients (B)	Std. error	Standardised coefficients (beta)	t-value	Sig.
Model 1	(Constant)	2.494	0.114	–	21.830	.000
	Pedagogical reform implementation	0.044	0.032	0.095	1.354	.177
Model 2	(Constant)	2.494	0.114	–	21.830	.000
	Supportive resources	0.181	0.044	0.284	4.0	0.000

Source: Primary data

(Significance is considered at $p < 0.05$.)

The regression results provide insights into the influence of pedagogical reform implementation and supportive resources on CBET adoption readiness among public universities in Northern Uganda.

Hypothesis 1 (H_1): Pedagogical reform implementation significantly influences CBET adoption readiness.

Model 1, pedagogical reform implementation, shows a positive but statistically insignificant effect on adoption readiness ($B = 0.044$, $\beta = 0.095$, $p = 0.177$). Although the positive coefficient suggests that an increase in pedagogical reform implementation is associated with a slight increase in adoption readiness, the relationship is not statistically significant at the 0.05 level. This implies that pedagogical reforms alone do not significantly predict readiness for CBET adoption.

Decision on hypothesis: Rejected, since $p > 0.05$.

Hypothesis 2 (H_2): Supportive resources significantly influence CBET adoption readiness.

Model 2, supportive resources, exhibit a positive and statistically significant effect on adoption readiness ($B = 0.181$, $\beta = 0.284$, $p = 0.000$). This indicates that an increase in supportive resources such as skilled personnel, infrastructure, and funding significantly enhances universities' readiness to adopt CBET.

Decision on hypothesis: Accepted, since $p < 0.05$.

The findings suggest that while pedagogical reform implementation contributes positively, it is not sufficient on its own to significantly influence adoption readiness. In contrast, supportive resources play a critical and statistically significant role. This highlights that institutional readiness for CBET adoption is more strongly driven by the availability of resources than by the implementation of pedagogical innovations alone.

Table 6: *Pedagogical reform implementation and CBET adoption readiness moderated by supportive resources*

Component	Variables / Statistics	β	R^2	ΔR^2	F	P
Independent variable	Pedagogical reform implementation(X)	—				—
Moderator	Supportive resources (W)	—				—
Interaction term	Pedagogical reform implementation× Supportive resources (XW)	—		0.0254	7.0794	0.0083
Model summary	Overall model		0.117		7.0794	0.0083
Additional statistics	R = 0.341; Adjusted R^2 = 0.109; Std. error = 0.17454					

Hypothesis 3 (H_3): Supportive resources significantly moderate the relationship between pedagogical reform implementation and CBET adoption readiness.

The model explains 11.7% (R^2 = 0.117) of the variance in adoption readiness, indicating a modest but meaningful explanatory power of pedagogical reform implementation and supportive resources. The interaction term (X × W) shows a statistically significant effect (p = 0.0083 < 0.05), with an increase in explained variance (ΔR^2 = 0.0254). This implies that supportive resources significantly strengthen the relationship between pedagogical reform implementation and adoption readiness. The F-statistic (F = 7.0794, p = 0.0083) confirms that the moderation model is statistically significant overall. It means that the effectiveness of pedagogical reform implementation depends on the availability of supportive resources, institutions with better resources (e.g., infrastructure, training, funding) are more likely to successfully translate reforms into adoption readiness.

Decision on hypothesis: Accepted, since $p < 0.05$. Supportive resources significantly moderate the relationship between pedagogical reform implementation and CBET adoption readiness. This highlights the critical role of institutional capacity in ensuring successful implementation of educational reforms.

Discussion

This study examined the influence of pedagogical reform implementation and supportive resources on CBET adoption readiness among public universities in Northern Uganda, including the moderating role of supportive resources. The discussion of findings is aligned to the study objectives as follows:

Objective One: To examine the relationship between pedagogical reform implementation and competence-based education and training adoption readiness among public universities in Northern Uganda

The findings revealed that pedagogical reform implementation had a statistically insignificant influence on CBET adoption readiness. Although universities are implementing innovative teaching approaches such as project-based learning, flipped classrooms and augmented reality, these strategies alone do not significantly improve institutional readiness for CBET adoption. This finding challenges assumptions in the existing literature that learner-centred pedagogies directly drive CBET adoption. Instead, the results suggest that in resource-constrained contexts such as Northern Uganda, pedagogical reforms alone may not translate into effective implementation. This finding is consistent with studies by Bogere et al. (2024) and Atibuni (2024), which argue that the effectiveness of pedagogical reforms is limited by inadequate institutional support and insufficient staff capacity. Therefore, the study demonstrates that while pedagogical reforms are important, they are not sufficient on their own to enhance CBET adoption readiness.

Objective Two: To establish the relationship between supportive resources and competence-based education and training adoption readiness among public universities in Northern Uganda

The study established that supportive resources have a statistically significant and positive influence on CBET adoption readiness. Universities with adequate funding, skilled educators, digital infrastructure, effective leadership and appropriate facilities were found to be more prepared for CBET implementation. This finding agrees with previous studies by Bogere et al. (2024), Collins (2024), and Kintu and Nalubega (2024), which emphasise the importance of faculty development, technological systems and institutional support in curriculum reform.

The findings are also consistent with reports from UNESCO (2024) and the National Council for Higher Education (2024–2025), which identify infrastructure, staff capacity and financial investment as key enablers of CBET implementation. The study, therefore, confirms that supportive resources are fundamental determinants of CBET adoption readiness, especially in developing-country contexts.

Objective Three: To determine the moderating effect of supportive resources on the relationship between pedagogical reform implementation and competence-based education and training adoption readiness among public universities in Northern Uganda

The findings further revealed that supportive resources significantly moderate the relationship between pedagogical reform implementation and CBET adoption readiness. This implies that the effectiveness of pedagogical reforms largely depends on the availability of enabling resources such as infrastructure, skilled personnel and financial support. In other words, pedagogical reforms become more effective when universities possess adequate supportive resources. This finding addresses an important methodological gap in previous literature because studies such as those by Kintu and Zhu (2023) and Mulder (2023) suggested possible interaction effects but did not empirically test them. The findings also support Atibuni (2024) and Bogere et al. (2024), who highlighted the importance of institutional support systems and educator preparedness in successful CBET implementation.

Conclusion and Recommendations

This study focused on improving CBET adoption readiness among public universities in Northern Uganda. It was hypothesised that implementing pedagogical reforms would enhance CBET adoption readiness, and that supportive resources such as adequate infrastructure and skilled staff would further strengthen this readiness. It was also hypothesised that supportive resources would significantly moderate the relationship between pedagogical reforms and CBET adoption readiness. Overall, the findings show that while pedagogical reforms alone are not sufficient, CBET adoption readiness is strongly improved when they are supported by adequate institutional resources.

Based on the conclusion, several recommendations are proposed in line with the study objectives.

First, although pedagogical reform implementation was found to have an insignificant direct influence on CBET adoption readiness, universities should continue strengthening innovative teaching approaches such as project-based learning, flipped classrooms, and technology-enhanced learning. Public universities should institutionalise these pedagogical reforms through departmental teaching policies, continuous professional development programmes, and curriculum review mechanisms to ensure consistent implementation across faculties and departments. In addition, the NCHE should organise national symposia, training workshops and benchmarking tours for lecturers and university administrators to promote the sharing of best practices in competence-based teaching and learning.

Second, since supportive resources were found to significantly influence CBET adoption readiness, the Ministry of Education and Sports should increase funding allocations to public universities for CBET implementation. Universities should prioritise investment in digital infrastructure, teaching facilities, instructional materials and staff development programmes to strengthen institutional readiness. Furthermore, teacher education reforms should integrate competence-based pedagogical skills to equip lecturers with the necessary competencies for effective curriculum implementation. The NCHE should also provide competitive grants and technical support to universities piloting innovative CBET practices.

Finally, because supportive resources significantly moderate the relationship between pedagogical reform implementation and CBET adoption readiness, universities should adopt an integrated implementation strategy that combines pedagogical innovation with adequate institutional support systems. This includes strengthening leadership support, improving staffing capacity, enhancing ICT infrastructure, and ensuring sustainable financial investment in CBET reforms. Such combined efforts are likely to improve institutional readiness and successful adoption of CBET in public universities in Northern Uganda.

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