

Physical Facilities Improvement Strategies and CBC Implementation in Private Universities in Nairobi County, Kenya

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Abstract

The purpose of this study was to examine capacity building strategies for faculty members that support CBC implementation in private universities in Nairobi County. A cross-sectional descriptive design that employed. Target population for the study was 26 private universities in Nairobi County. The study population comprised of 26 deans of schools, 26 chairs of departments, and 260 faculty members from the private universities in Nairobi, county, Kenya. The universities were categorized as Faith-based; church-based and private, private universities. Semi-structured questionnaires and an interview guide were used to collect data. The study used descriptive and inferential statistics to analyze data. Qualitative data was analysed thematically and presented in themes. Findings indicated a significant and positive effect of physical facilities improvement strategies and implementation of CBC ($\beta = 0.087$, $t=3.833$, $p = 0.000$). Transitioning to competence-based education necessitates significant investments in infrastructure, such as flexible learning spaces and tech-enhanced classrooms. Universities are seeking external funding to meet these challenges, indicating their commitment to overcoming financial barriers. Adequate resources are important for effective CBC implementation. Maintaining a low teacher-to-student ratio is also essential for individualised attention. The government and stakeholders should enhance financial support for universities to upgrade infrastructure and faculty training. Private universities should focus on continuous professional development, integrating modern teaching methods and technology in CBC. Strong assessment systems are necessary for evaluating CBC effectiveness, guided by feedback from various sectors.

Key terms: Kenya, Nairobi County, private universities, CBC implementation, physical facilities improvement strategies

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1.0 Introduction

Background to the Study

Competency-Based Curriculum (CBC) implementation requires well-equipped learning environments that support practical, learner-centered activities. Consequently, various institutions have to prioritise the improvement of physical facilities. The CBC aims to create flexible, interactive spaces that meet the needs of skills-based education, facilitating new learning and practical application (Errida & Lotfi, 2021; Gouédard et al., 2020). It promotes critical thinking, adaptability, and lifelong learning, keeping education relevant to societal changes (Muchira et al., 2023). Moreover, it shapes educational trajectories and societal standards, and serves as an evaluation tool for instructional effectiveness, allowing educators to assess the impact of their teaching strategies on student learning (Ojong & Maduka, 2017).

Kenya's education system has experienced several reforms to meet emerging needs and align with national development goals. Owiti (2021) highlights changes including the restructuring of the Ministry of Education and the introduction of a nine-year basic education model. The shift from the 7-4-2-3 to the 8-4-4 system aimed to enhance practicality and skill orientation (Akala, 2021), but was criticized for its comprehensiveness and financial burden (Milligan, 2017). Rising unemployment among graduates prompted the introduction of the Competency-Based Curriculum (CBC), though its implementation remains controversial (Amutabi, 2019).

The transition to CBC is a significant shift in Kenya's education system, requiring structural and pedagogical adjustments. Osyangu et al. (2021) indicates that curriculum reforms are complex and demand careful planning, stakeholder involvement and sufficient resources. The Ministry of Education has set 2029 as the target year for full CBC implementation at the university level, necessitating curriculum reviews across higher education institutions (Owiti, 2021). Akala (2021) highlights that for CBC to succeed, there must be adequate teacher training, policy support, and resource allocation. Change within the education sector is often met with resistance; however, institutions must develop adaptive strategies to enhance their ability to implement reforms effectively (Errida & Lotfi, 2021).

Statement of the Problem

CBC is being implemented in Kenya, focusing on competencies and real-world applications while embracing learner-centered teaching and authentic evaluations (Sifuna & Obonyo, 2019). But new problems have surfaced, including insufficient resources, outdated facilities, and an absence of qualified teachers (Wambiya & Ogula, 2023). Educators have received limited training in content and teaching methods, impacting the effective delivery of the curriculum's goals. Moreover, there is a shortage of approved textbooks and resources (Makunja, 2016). The curriculum reform has seen little involvement from the public and stakeholders, such as parents (Sifuna & Obonyo, 2019). Muchira et al. (2023) highlight various hurdles, including insufficient teacher training and misaligned assessments, that hinder the successful adoption of Competence Based Education (CBE) models. As CBC

students approach college enrollment in 2029, there is an urgent need for learner-centered strategies to ensure a smooth transition. The inconsistent application of CBC has left students unprepared for higher education, as early implementations faced significant challenges. There is a research gap on physical facilities improvement strategies established to support CBC implementation, hence the need for this study.

Purpose of the Study

The purpose of this study was to identify physical facilities improvement strategies established to support CBC implementation in private universities in Nairobi County.

Research Hypotheses

H1: physical facilities improvement strategies support CBC implementation in private universities in Nairobi County.

2.0 Materials and Methodology

Research Philosophy

This research embraced pragmatism philosophy. The researcher involved designs that deploy operational conclusions based on what produced better results in the quest of finding answers to the questions under investigation in this study. This enabled this research to be innovative and dynamic in its ways as it found solutions to the research objectives.

Research Design

The research used a cross-sectional descriptive design that incorporated a mixed methods research strategy, using both quantitative and qualitative techniques to enhance the understanding of the research issue and gather extensive data from the sample size.

Location of Study

Research was conducted at 26 private institutions in Nairobi County, Kenya (CUE, 2024) that serve the county and its residents via various educational programs.

Target Population

Participating 26 private universities in Nairobi County constituted the study's target population. Study population comprised of 26 deans of schools, 26 chairs of departments and 260 faculty members from the private universities in Nairobi, county, Kenya. The universities were categorized as Faith-based; church-based and private, private universities.

Sample Size and Sampling Techniques

A representative sample of students from private universities was obtained for this research by using a multi-stage sampling technique. The study adopted the three-stage sampling technique. Stratified sampling was used in categorizing the private universities into three strata namely: faith-based, church-based, and private. Simple random sampling was used in selecting the specific faculty members who participated in the study. Purposive sampling was employed for the dean and the chairs of departments as well as for the department of education. This is because the department deals directly with education curriculum not only in implementation but also it trains the teachers and all other educators, career changers, administrators, paraprofessionals and all other educational agents. Purposeful sampling was reliant on the objective or target of the assessment. Consequently, this study involved sampling of faculty members randomly, deans and chair of the educational department

purposively and the universities were stratified. For the different strata of private universities in the study, 30% of the faculty members were selected to participate in the study (Mugenda & Mugenda, 2003).

Data Collection Instruments

A combination of semi-structured questionnaires and an interview guide were used to gather data. To ensure reliability and validity of this study the researcher used a questionnaire duly completed in a pilot study. Piloting was carried out at a private university in Nairobi County.

Data Collection Procedures

The researcher obtained an introductory letter from the university's Directorate of Postgraduate Studies to apply for a research permit from NACOSTI. Permission from the commission of university education facilitated data collection. Visits to private universities were conducted, and appointments with respondents were arranged. Three research assistants were trained on study objectives, dress codes, and communication skills. Respondents were informed about research objectives, confidentiality, and voluntary participation before questionnaire distribution. Questionnaires were collected immediately or emailed later. Interviews with deans and faculty were conducted while taking notes.

Data Analysis

An analysis of data from participants in Nairobi County's private universities involved compiling and organizing survey results before using SPSS for analysis. Frequencies, percentages, averages, and standard deviations are examples of descriptive statistics that were used to identify fundamental patterns in data. Thematic analysis of qualitative data followed the study's objectives and respondent categories. Quantitative survey data was analysed after primary and secondary data had been gathered via questionnaires, documents and observations. Inferential statistics included standard multiple linear regression, with figures and charts displaying findings. Qualitative data was thematically analysed.

Ethical Considerations

University's postgraduate department facilitated research process by providing an introduction letter to NACOSTI, allowing researcher to obtain necessary research permission. A cover letter was also issued to obtain assistance from respondents who were requested to voluntarily engage in the study. Researcher ensured compliance with voluntary consent of Deans, CoDs and Faculty members, clearly explaining the study's purpose. Participants were not required to provide names and were given coded identification instead. Confidentiality regarding collected data was guaranteed. All participants were made aware that their participation was entirely optional and that they may withdraw at any point without penalty. Data collected was stored electronically, with password protection.

3.0 Results and Discussion

Descriptive Statistics

Question 1 examined whether private universities maintain and service physical facilities like classrooms, laboratories, and libraries. The mean score of 3.58 indicated general agreement among respondents that these facilities are maintained. A standard deviation of 1.064 showed moderate variability, suggesting inconsistency across institutions. This variation may be due to differing resources, priorities, and management practices among the universities.

Question 2 assessed the use of educational tools and platforms to support CBC implementation. A mean score of 3.63 reflected strong agreement that these tools are being leveraged. The standard deviation of 0.995 indicated some variability, meaning not all universities are using these tools equally well. The findings suggest ongoing training and support are needed for effective integration of educational technology.

Question 3 investigated whether universities have reviewed physical facilities to support flexible learning pathways. A mean score of 3.69 showed high agreement that such reviews have taken place. With a standard deviation of 1.004, responses showed moderate variability across institutions. This suggests that while many universities are adapting, some face challenges due to factors like funding and available space.

Question 4 evaluated whether universities have established a CBE framework to support CBC. A mean score of 3.69 showed strong agreement among respondents. The standard deviation of 0.936 indicated relatively low variability, suggesting more uniform efforts across institutions. This uniformity is important, as a well-structured framework ensures effective curriculum development and evaluation.

Question 5 assessed whether private universities have implemented project-based learning to align with CBC requirements. The mean score of 3.74 reflected high agreement that this strategy is being adopted. A standard deviation of 1.022 showed moderate variability in responses. This implies that while many institutions are integrating project-based learning, others may still be in transition. Results are summarised in Table 1:

Table 1: Strategies by private universities for effective CBC implementation

Statements	N	Minimum	Maximum	Mean	Std. Deviation
Private universities have maintained and serviced the physical facilities	107	1	5	3.58	1.064
Private universities have leveraged their educational tools and platforms to support CBC implementation	107	1	5	3.63	0.995
Private universities have reviewed their physical facilities to allow flexible learning pathways	107	1	5	3.69	1.004
Private universities have established a CBE framework	107	2	5	3.69	0.936
Private universities in aid of improving the physical facilities for CBC implementation	107	2	5	3.74	1.022

Source: Survey Data (2024)

The correlation analysis between "Physical Facilities" and "Effective CBC Implementation" reveals a significant positive relationship. With a p-value below 0.001, the Pearson correlation coefficient comes out at 0.554. This moderate and statistically significant correlation indicates that improvements and investments in physical facilities are associated with the successful implementation of the CBC in private universities. We may reject the null hypothesis that CBC adoption is unrelated to physical facility improvement since the p-value is less than 0.01. The null hypothesis that these variables do not have any meaningful link is rejected. Correlation analyses is summarised in Table 2.

Table 2 : Correlation between physical facilities and effective CBC Implementation

		Effective CBC Implementation	Physical Facilities
Effective CBC Implementation	Pearson	1	.554**
	Correlation		
	Sig. (2-tailed)		0.000
	N	107	107
Physical Facilities	Pearson	.554**	1
	Correlation		
	Sig. (2-tailed)	0.000	
	N	107	107

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Survey Data (2024)

The study conducted regression analysis on physical facilities improvement strategies and implementation of CBC in private universities in Nairobi County. Table 3 presents the model summary for physical facilities improvement strategies and implementation of CBC. Results indicate a moderate relationship between physical facilities improvement strategies and implementation of CBC, with an R value of 0.350. According to the model, physical facilities improvement strategies accounts for only 12.3% of the variance in implementation of CBC, denoted by R square of 0.123.

Table 3 : Model summary for physical facilities and effective CBC Implementation

R	R Square	Adjusted R Square	Std. Error of the Estimate
.350 ^a	0.123	0.114	0.46772

a. Predictors: (Constant), physcial_facilities

Source: Field Data 2025

ANOVA assessed whether there was a statistically significant difference between group means and to determine if the independent variable explained a significant portion of the variance in the dependent variable. Table 4 indicates a significance level of 0.000, hence a significant relationship between physical facilities improvement strategies and implementation of CBC in private universities. The calculated F-value ,14.7, is greater than the critical F-value ,3.9, indicating that the regression model was statistically significant.

Table 4: ANOVA for physical facilities and effective CBC Implementation

	Sum of Squares	df	Mean Square	F	Sig.
Regression	3.215	1	3.215	14.696	.000 ^b
Residual	22.970	105	0.219		
Total	26.185	106			

a. Dependent Variable: implementation

b. Predictors: (Constant), physcial_facilities

Source: Field Data 2025

Table 5 illustrates the regression equation as:

$$Y = 2.8 + 0.335 X_4 + \varepsilon$$

Hence, there was a significant and positive effect of physical facilities improvement strategies and implementation of CBC ($\beta = 0.087$, $t=3.833$, $p = 0.000$). Hence, implementation of CBC would vary by 0.087 units for every unit change in physical facilities improvement strategies.

Table 5: Regression coefficients for physical facilities and effective CBC Implementation

	Unstandardized Coefficients	Std. Error	Standardized Coefficients	t	Sig.
(Constant)	2.823	0.374		7.556	0.000
Physcial facilities	0.335	0.087	0.350	3.833	0.000

a. Dependent Variable: implementation

Source: Field Data 2025

These findings support the alternative hypothesis H1: physical facilities improvement strategies support CBC implementation in private universities in Nairobi County. The positive and significant beta coefficient confirms that physical facilities improvement strategies affect implementation of CBC in private universities in Nairobi county. This is complemented by Prasetyono et al. (2021), who highlight the need for physical spaces to be adaptable, well-equipped with digital tools and conducive to collaborative and individualized learning. Kariippanon et al. (2019) also advocate for the establishment of elaborate technological infrastructure—including reliable internet, digital devices and ongoing technical support—to enable the use of innovative instructional resources. This aligns with Eden et al. (2024), who stress that institutional support through teacher training, peer mentoring and regular workshops is essential to keeping educators updated on CBC methodologies. Similarly, Ngeno et al. (2021) found that physical infrastructure moderately influences the implementation of CBC. They argue that facilities such as STEM labs, creative arts spaces, and sports grounds are critical in supporting the holistic development envisioned in CBC.

Results revealed that private universities are adapting their physical facilities to meet the needs of CBC through personalized and technology-enhanced learning environments.

Respondents emphasized that change is inevitable, and universities have no choice but to align with CBC requirements. This shift aligns with global trends in reshaping education to focus on competencies. As noted by Bratianu et al. (2020), competency-based learning demands a transformation of institutional spaces to support active, learner-centered pedagogy.

Respondents indicated that universities are creating inclusive, flexible spaces with movable furniture and technology to support group work, discussions and peer learning. These redesigned environments are intentionally built to promote collaboration, which is central to CBC. Such efforts reflect a strong institutional commitment to learner-centered education. This approach is supported by de Hei et al. (2020), who emphasized the role of collaborative learning spaces in achieving CBC goals.

Smart classrooms equipped with interactive whiteboards, projectors, and sound systems are being developed to support dynamic teaching. Learning Management Systems (LMS) have also been enhanced, allowing access to resources, assignments, and virtual discussions. These tools improve faculty-student engagement and enhance the digital learning experience. According to Al-Nuaimi and Al-Emran (2021), technology-enhanced learning systems are essential in modern educational practices for CBC delivery.

Private universities are upgrading their laboratories to support hands-on, practical learning essential in CBC environments. Respondents noted that these facilities allow students to build competencies through experimentation and applied learning. Laboratories were described as essential components for science and technical-based curricula. This concurs with Thees et al. (2020), who emphasized the critical role of well-equipped labs in supporting meaningful learning outcomes.

Universities have designated areas for both individual and group study equipped with learning resources and technology. These spaces also include advisory and guidance areas to support student growth and personalized learning. Respondents emphasized the value of self-paced and team-based learning within CBC frameworks. Michaelsen et al. (2023) support this by highlighting the importance of both independent and collaborative learning environments. Innovation hubs and project-based learning spaces have been created to enhance creativity and entrepreneurship among students. These areas are designed for hands-on engagement and often support partnerships with industry. Respondents pointed out that such spaces promote problem-solving, a key skill in CBC. Nadira et al. (2020) underscores that project-based learning significantly contributes to competency development and innovation.

Outdoor and informal learning spaces such as cafes and lounges have also been utilized to support experiential and flexible learning. Respondents highlighted that these areas help promote student well-being and informal academic engagement. Universities are intentionally integrating nature and comfort into the learning experience. Berg et al. (2021) support the value of outdoor and informal spaces in promoting holistic learning.

Respondents identified several challenges, including the high financial cost of renovating infrastructure to suit CBC requirements. A key concern was limited funding, which hampers timely implementation. Respondents called for increased support to ease the financial burden of upgrading physical spaces. This aligns with Arends (2023), who noted that successful CBC implementation demands significant investment in learning infrastructure.

Results indicated that universities are seeking external funding from donors, government, and other stakeholders. Respondents emphasized the government's role in supporting private universities in the CBC rollout. They also raised concerns about the

teacher-learner ratio and the need for staff retooling. These concerns echo Akala (2021), who stressed that sufficient resources and well-trained teachers are essential for CBC success. Moreover, according to these respondents, expensive infrastructural expenses and cost of training faculty members were another challenge that could not be ignored. These were thoughts stated by Response 6. This highlighted the need for adequate staffing and physical resources to help proper implementation of CBC (Gulled, 2023).

4.0 Conclusion

Transition to competence-based education requires substantial investments in infrastructure, including the development of flexible learning spaces, laboratories, and technology-enhanced classrooms. Despite these challenges, universities are actively seeking external funding from donors, friends of the university, and the government to address these needs. The pursuit of additional resources highlights the determination of private universities to overcome financial obstacles and create an environment conducive to competence-based learning. Having sufficient physical resources is essential for CBC to be effectively implemented, since it has a direct influence on the quality of education and students' capacity to participate in practical, hands-on learning. In addition, it is crucial to keep the teacher-to-student ratio low so that each student may get the individualised attention and assistance they need. The dedication to modifying physical spaces shows that the significance of the classroom setting has been more widely recognised.

5.0 Recommendations

The government and other stakeholders should provide increased financial support to help universities upgrade physical infrastructure and offer comprehensive faculty training. Private universities should also take the lead in investing in continuous professional development, emphasizing modern teaching methods, technology use, and best practices in CBC. Collaboration among universities, government bodies and educational stakeholders is vital to promote knowledge exchange and improve the quality of CBC delivery.

Private universities should implement strong assessment and monitoring systems to evaluate CBC effectiveness regularly, using feedback from students, faculty, and employers. These mechanisms will help keep the curriculum responsive and relevant to market needs. Universities should also prioritize student-centered learning approaches that promote real-world skills through research, project-based learning, and problem-solving activities. Implementers of these recommendations include private university management, the Ministry of Education, development partners and faculty development units within universities.

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