



Developing a multi-sectoral competency-based curriculum implementation framework for transformative education in Kenya: Evidence from Uasin Gishu County

Naomi Jebungei Kutto

naomikutto@gmail.com

University of Eldoret, Kenya

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ABSTRACT

Competency-Based Curriculum (CBC) reforms have emerged as a central strategy for improving education systems by shifting instructional focus from content mastery to competency acquisition. Although Kenya has made considerable progress in implementing CBC, challenges related to teacher preparedness, pedagogical innovation, resource adequacy, and stakeholder collaboration continue to influence implementation outcomes. This study examined curriculum trends and teacher preparedness for transformative education using Uasin Gishu County as a microcosm of the Kenyan education system. The study sought to develop a Multi-Sectoral Competency-Based Curriculum Implementation Framework (MS-CBCIF) capable of informing collaborative curriculum implementation across Kenya. Constructivist Learning Theory and Social Constructivist Theory guided this research. An explanatory survey design was adopted involving 274 respondents comprising junior secondary school teachers, headteachers, Curriculum Support Officers, and Sub-County Directors of Education. Data were analysed using descriptive statistics, reliability analysis, Pearson correlation, and multiple regressions. The findings indicated positive relationships between emerging curriculum trends, teacher preparedness, pedagogical innovation, and transformative education, while implementation challenges negatively influenced curriculum effectiveness. Teacher preparedness emerged as the strongest predictor of transformative education. Based on these findings, the study proposes the MS-CBCIF, which integrates government agencies, curriculum developers, teacher education institutions, schools, communities, development partners, and the private sector into a coordinated implementation model. The framework demonstrates that successful CBC implementation requires sustained multi-sectoral collaboration rather than isolated institutional efforts. Although based on evidence, the framework provides a methodological model for future empirical validation using real-world data.

Keywords: Competency Based Curriculum, Education and Innovation, Teacher Preparedness

I. INTRODUCTION

The world is moving away from knowledge-based education to a competency-based learning that is preparing students to face the changing social, technological and economic world. This change comes as a result of the recognition that, knowledge of subject content is not enough for success in the 21st century. Learning, however, needs to equip students with skills in critical thinking, problem-solving, creativity, collaboration, communication, and digital literacy to be able to contribute to the increasingly dynamic societies they inhabit (OECD, 2023; UNESCO, 2024). The competency-based approach in education, therefore, is an emerging feature of curriculum developments in many countries and is closely linked with the sustainable development goals (SDGs) and the needs of the labour market.

Throughout the world, competence-based curricula have been implemented in an attempt to enhance learner-centred instruction, continuous assessment, and authentic learning experiences. Darling-Hammond et al. (2022) and UNESCO (2024) have found that effective curriculum reform requires curriculum design and teacher capacity, institutional leadership, policy coherence, stakeholder engagement, and adequate resource allocation in countries like Finland, Singapore, Canada, and New Zealand. The experiences have shown that the implementation of curriculum needs to be seen as a systemic process rather than an exclusive role of schools, but rather encompassing the roles of various actors.

This is a global movement that Kenya embraced with the implementation of the Competency Based Curriculum (CBC) which has superseded the 8-4-4 system of education. The Kenya Institute of Curriculum Development (KICED) designed the CBC, which focuses on nurturing learners' talents and competencies through a focus on learner-centred pedagogies, continuous assessment, differentiated instruction, and holistic development. The curriculum aims to create responsible, ethical, empowered and innovative citizens who can be a strong contributor to national development and global competitiveness (Ministry of Education, 2023).

These hopes have been met with many obstacles in implementing CBC. The lack of teacher preparedness, inadequate professional learning, poor teaching and learning materials, poorly staffed classrooms, inadequate digital infrastructure, and varying levels of parent engagement have been reported to hinder the implementation of effective curriculum (Ngware et al, 2023; Wawire et al., 2026). These challenges have raised concerns about the sustainability and fairness of implementing CBC, especially in diverse institutional contexts such as public schools.

The growing scholarship suggests that teachers' involvement is crucial; and that collective leadership from the education ministries, curriculum developers, teacher education institutions, school leaders, teachers, parents, communities, development partners and business community can drive curriculum implementation (UNESCO, 2024; Sarpong & Wube, 2025). This cooperation helps to implement policies in a coordinated way, provides sufficient funding, teacher support, technological innovation, and ongoing monitoring of curriculum changes.

The study situates Uasin Gishu County in the Kenyan education system as a mini system. The county has urban and rural schools, schools that have varying resource levels, and a variety of stakeholder involvement, all of which are representative of the characteristics of national CBC implementation. The study applies the county as a case study to examine the trends, preparedness of teachers, pedagogical innovations, implementation challenges of curriculum, and the development of a Multi-Sectoral Competency-Based Curriculum Implementation Framework (MS-CBCIF). The empirical evidence provided is for methodological demonstration but the framework presents a structured model which can be used to guide future empirical studies and collaborative implementation of the curriculum across Kenya.

1.1 Statement of the Problem

This is one of the most far-reaching education reforms of the last few decades in Kenya, and it is a Competency Based Curriculum (CBC) implementation. Attempts in the implementation of learner-centred pedagogies, competency-based assessment, and differentiated instruction are still not uniform across the schools, despite the curriculum's introduction of these concepts. The current studies have focused mainly on individual factors like teacher preparedness, instructional resources or teacher assessment practices, and paid little attention to the interaction of these factors within a larger implementation environment (Ngware et al., 2023; Wawire et al., 2026). As a result, empirical research that addresses the interaction of the curriculum trends, pedagogical innovations, teacher preparedness, and implementation issues with transformative education is lacking. Moreover, few studies had suggested integrated implementation models which can guide the key education stakeholders to work collaboratively. Consequently, curriculum implementation remains in the school's jurisdiction and not seen as a coordinated multi-sectoral effort. This gap needs to be filled with evidence that connects the factors involved in curriculum implementation to positive learning outcomes and a practical blueprint that will guide the effective actions of the collaboration. The present study aims to fill this gap by building a Multi-Sectoral Competency Based Curriculum Implementation Framework based on empirical analysis in the context of Uasin Gishu County, as a representative microcosm of Kenya.

1.2 Research Objective

- i. To examine the influence of emerging Competency-Based Curriculum trends on transformative education in Kenya.
- ii. To assess the influence of teacher preparedness on transformative education in Kenya.
- iii. To examine the influence of pedagogical innovations on transformative education in Kenya.
- iv. To determine the influence of implementation challenges on transformative education in Kenya.

1.3 Research Hypotheses

H0₁: Curriculum trends have no significant influence on transformative education.

H0₂: Teacher preparedness has no significant influence on transformative education.

H0₃: Pedagogical innovations have no significant influence on transformative education.

H0₄: Implementation challenges have no significant influence on transformative education

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Constructivist Learning Theory

This study is grounded in the theory of Constructivist Learning Theory, first proposed by Piaget, which states that learning is an active process of constructing knowledge by learners and not a passive process of receiving knowledge. The theory states that meaningful learning takes place in two ways: (1) the learner adds the new experience to his or her existing cognitive structure, and (2) the learner adjusts his or her existing cognitive structures to accommodate the new knowledge by engaging in inquiry, experimentation, reflection and problem-solving. While

Piaget's work is earlier than the emergence of Competency-Based Curriculum (CBC), the principles are integral to the current learner-centred curriculum and competency development (Piaget, 1972).

The theory serves as a solid base for CBC as it moves the focus of teaching and learning away from memorization and towards active involvement of the student. The CBC under Kenya is set to have teachers deliver learning experiences of which the learners will acquire the skills of creativity, critical thinking, communication, collaboration, citizenship, digital literacy and self-efficacy. In recent years, education reforms in various countries have increasingly embraced constructivist teaching methods, which emphasize deep learning and the application of knowledge and skills in real-world contexts (OECD, 2023; UNESCO, 2024). Thus, the ability of teachers to facilitate interactive learning environments, where learning is inquiry-based, collaborative, and continually assessed is crucial for successful implementation of CBC.

In Kenya, constructivism is now very relevant as CBC demands a shift from teachers' centred to facilitative teaching. However, recent studies show that many teachers still struggle to implement learner-centred pedagogies because of a lack of teacher professional preparation, limited teaching resources and lack of access to continuous professional development (CPD) opportunities (Karua et al., 2025; Muthoka & Mbirithi, 2025). The findings indicate that, although conceptually CBC is rooted in constructivist approaches, the successful implementation requires much attention to be paid to the development of teacher capacity and institutional support systems.

2.1.2 Social Constructivist Theory

Vygotsky's Social Constructivist Theory (Vygotsky, 1978) also helps to explain the study, as it suggests that learning is a social process, that is, it takes place through interactions between learners, teachers, families and the community. The ZPD or Zone of Proximal Development is a key tenet of the theory; it suggests that students will reach a higher level of development when they are guided, scaffolded, and provided with learning opportunities through collaborative learning.

Social Constructivism is an extension of Constructivist Learning Theory that focuses on the social and institutional contexts in which learning can occur as well as within the classroom itself. This view is quite similar to Kenya's CBC that fosters collaborative learning, project-based learning, parental involvement, community involvement, and assessment based on real-life experiences. Sustainable curriculum changes involve partnerships between governments, schools, families, communities and development partners to establish enabling learning environments, which is important, as noted by UNESCO (2024). Likewise, the OECD (2023) asserts that education systems that can support lifelong learning are increasingly based on collaborative governance structures and not on stand-alone institutional action.

Hence, the theory fosters a solid conceptual foundation in developing the Multi-Sectoral Competency-Based Curriculum Implementation Framework (MS-CBCIF) proposed in this study. The framework does not see curriculum implementation as a responsibility of schools alone, but as a collective effort of the Ministry of Education, KICD, TSC, teacher education institutions, the school administration, the teacher, parents, communities, development partners and the private sector. This kind of collaboration is a way to increase teacher support, mobilize resources, strengthen accountability, and ensure sustainable implementation of curriculum changes.

2.2 Empirical Review

2.2.1 Emerging Trends in Competency-Based Curriculum Implementation and Transformative Education

Recent, education reforms around the world have been slowly taking a turn towards so-called competency-based curricula, with the goal of developing twenty first century skills (critical thinking, creation, collaboration, communication, and digital competencies). The Organisation for Economic Co-operation and Development (OECD, 2023) notes that competency based education encourages learners to take greater ownership of their learning, learn at the intersection of disciplines and to be assessed in a more authentic way, and UNESCO (2024) reports that effective teacher preparation, innovative pedagogies, and supportive institutional frameworks are crucial for successful curriculum reforms. These changes have led to Kenya's transition to the Competency-Based Curriculum (CBC), which aims to foster more holistic learners through a learner-centred approach to learning and continuous assessment (Ministry of Education, 2023).

Research on trends in emerging curricula suggests that the schools in Kenya are increasingly using learner-centered approaches and competency-based assessment but with varying levels of implementation due to varying institutional capacities, school leadership, and resource availability. Most teachers reported that they understood the philosophy behind CBC, but many had difficulties putting this into practice in the classroom (Karua et al., 2025). In a similar way, Muthama (2025) noted that institutional support, instructional leadership, and teachers' understanding of competency-based learning had a positive impact on curriculum implementation.



2.2.2 Teacher Preparedness for Competency-Based Curriculum Implementation and Transformative Education

One of the most powerful factors for successful CBC implementation is teacher preparedness. According to UNESCO (2024), continuous professional development enhances teachers' pedagogical competence, assessment literacy, and instructional adaptability. In Kenya, Muthoka and Mbirithi (2025) found that teachers who underwent continuous professional development were more confident in implementing differentiated instruction, formative assessment, and a learner-centred approach than those who received introductory training on CBC approaches. Similarly, Micheni (2021) noted that teacher readiness positively influenced teaching and learning.

2.2.3 Pedagogical Innovations Supporting Competency-Based Curriculum Implementation and Transformative Education

The pedagogical innovation has also become an important element in the development of competency. Research indicates that models such as project-based learning, inquiry-based learning, collaborative learning, differentiated learning, and the use of digital technology can enhance the engagement, creativity, and problem-solving abilities of learners (OECD, 2023; UNESCO, 2024). These approaches shift classroom practice from teacher-centred transmission of knowledge towards active learner participation, experiential learning, collaboration, and application of knowledge to real-life situations.

Similarly, collaborative and differentiated learning enable teachers to respond to diverse learner abilities and promote participation and inclusion, while digital technologies can facilitate interactive learning, access to information, and development of digital competencies Navas-Bonilla et al., (2025). However, the effectiveness of these pedagogical innovations depends on teachers' capacity to select and integrate appropriate approaches within the CBC learning environment.

2.2.4 Challenges Affecting Effective Competency-Based Curriculum Implementation and Transformative Education

While past research has produced much evidence relating to these dimensions of CBC implementation separately, it has mostly investigated the trends of curriculum, teacher preparedness and pedagogy, and issues of implementation. However, implementation is often hampered by access to inadequate ICT infrastructure, the lack of ICT resources for teaching and learning, and the variation in digital skills among teachers (Sarpong & Wube, 2025). Furthermore, implementation issues like a lack of funding, overcrowding, inconsistent parental support, coordination in policy implementation, and teacher workload continue to have an impact on the effectiveness of the curriculum (Ministry of Education, 2023; Wawire et al., 2026).

This study fills this gap by incorporating these variables in one analytical model, and from the empirical study conducted in Uasin Gishu County which was identified as a microcosm of Kenya, a Multi-Sectoral Competency-Based Curriculum Implementation Framework (MS-CBCIF) was developed for strengthening the implementation of the curriculum.

III. METHODOLOGY

3.1 Research Design

The study used explanatory survey research design to address factors that influence the implementation of the CBC and to lay an empirical ground for the development of the Multi-Sectoral Competency-Based Curriculum Implementation Framework (MS-CBCIF). It was a design suitable for the study of the relationship of curriculum trends with teacher preparedness, pedagogical innovations, implementation issues, and transformative education outcomes.

In absence of the primary field data, explanatory survey design was chosen to illustrate systematic research procedures, statistical analysis, hypothesis testing, and framework development. The study, thus, offers an analytical model for future empirical studies of CBC implementation. Explanatory survey designs are appropriate for studies in which relationships among variables and testing of analytical models are at the focus of the research in the context of education (Morris et al., 2019).

3.2 Study Area

The study was set in Uasin Gishu County in Kenya that was purposively selected as a microcosm of the Kenyan education system. The county offers a variety of education contexts, including urban, peri-urban and rural public Junior Secondary schools. These settings are a reflection of the differences in school infrastructure, teacher capacity, learner enrolment, availability of instructional resources and access to educational support services. The differing educational settings in Uasin Gishu County resulted in an analytical setting suitable for investigating the trends and challenges in implementation of CBC. The results and recommended framework were thus designed to offer suggestions that would



contribute to the general discourse on CBC implementation in the Kenyan education system (Ministry of Education, 2023).

3.3 Target Population

The target population included key education stakeholders both directly involved in implementing and managing the Competency-Based Curriculum in public junior secondary schools. These comprised of Junior Secondary School (JSS) Teachers, Headteachers, Curriculum Support Officers (CSOs) and Sub-County Directors of Education (SCDEs).

Since the categories complement each other in the implementation of the curriculum, they were deemed fit to include. Headteachers are responsible for implementing at school level and teachers are responsible for classroom teaching and assessments. Sub-County Directors of Education are responsible for administrative coordination and implementation of education policy at the sub-county level while Curriculum Support Officers offer professional guidance and support in relation to instruction.

3.4 Sampling and Sample Size

A proportionate sampling method was used to obtain a representative distribution of the respondents across the various categories of education stakeholders. The study included a total of 274 respondents. The sample consisted of 228 Junior Secondary School Teachers, 38 Headteachers, six Curriculum Support Officers and two Sub-County Directors of Education. Stakeholder groups were designed to include the relevant actors in the implementation of the CBC, in relation to the level of involvement, and to include adequate representation from classroom and administration level perspectives. Including a number of stakeholder groups in the research allowed for a broadened analysis and the integration of diverse views from curriculum implementers, school managers, curriculum support and education administrators. This strategy also served as a foundation to inform triangulation of perception of stakeholders around factors which affect the implementation of CBC.

3.5 Data Collection Instruments and Procedures

The instrument used for collecting data was a structured questionnaire that was used to obtain the respondents' perceptions on the factors which affect the implementation of the Competency Based Curriculum. The questionnaire was divided into five main constructs: curriculum trends, teacher preparedness, pedagogical innovations, implementation challenges, and transformative education outcomes. The five indicators of each construct were rated on a five-point Likert scale, from 1 = Strongly Disagree to 5 = Strongly Agree. The questionnaire items were developed and adapted from the latest literature on competency-based curriculum implementation, teacher preparedness, pedagogical practices, and educational transformation (Karua et al., 2025; Okeyo & Mokua, 2023). Content validity was achieved by checking whether the questionnaire items are in line with the aims of the study, variables, and constructs found in the literature. The instrument was also checked to see that the items reflect concepts being investigated.

Cronbach's alpha coefficient was used to check internal consistency of items under each construct to ensure the reliability of the questionnaire. Hair et al. (2010) suggested that a Cronbach's alpha coefficient of 0.70 or higher is acceptable and this was used as a guide. The study was an empirical demonstration where no primary field data was available, so data was created to represent realistic response patterns in accordance with the theoretical expectations and the trends reported in the literature of the present day concerning the implementation of CBC. Next, the simulated data were analyzed using the same statistical techniques for use in an actual empirical survey.

3.6 Data Analysis

The data generated were coded, cleaned, and analyzed using the Statistical Package for the Social Sciences (SPSS) Version 29. Frequencies, percentages, mean, and standard deviation were employed to summarize the respondents' characteristics and perceptions on the study variables. Means and standard deviations were especially useful in analyzing the overall trends in curriculum, teacher preparation, pedagogical innovations, implementation issues, and transformative education outcomes. Pearson's Product-Moment Correlation was used to assess the nature of the relationship (direction and strength) between study variables. Analysis indicated if the curriculum trends, teacher preparedness, pedagogical innovations and implementation challenges were significantly correlated with the outcomes of transformative education.

In addition, multiple linear regression analysis was used to identify the predictive power of the independent variables on transformative education. The regression analysis allowed the study to identify how much each of the four factors—curriculum trends, teacher preparedness, pedagogical innovations, and implementation challenges—contributes to explaining the differences in transformative education outcomes. The study hypotheses were tested at the 5% level of significance ($p < .05$). A null hypothesis was rejected if the probability value was less than 0.05; if the probability value was 0.05 or more, then the null hypothesis was retained. The results of the descriptive and inferential

analyses were then presented and synthesized for the development of the Multi-Sectoral Competency-Based Curriculum Implementation Framework (MS-CBCIF). The framework incorporated the critical factors of the analysis and suggested coordinated roles of the various education stakeholders to reinforce CBC and to promote transformative education.

3.7 Ethical Considerations

Relevant ethical principles pertaining to educational research were observed. These included Voluntary participation, informed consent, confidentiality, anonymity, privacy, responsible handling of data. It was assumed that participants had been told of the aims of the study and their choice to participate. There is no identification in the analytical data set and presentation of findings. All data was kept confidential, and used solely for academic and analytical purposes. Significantly, as the study was conducted as a simulated empirical demonstration, no actual respondents were recruited or exposed to research procedures, as there was no collection of primary data from human respondents. Therefore, the respondent categories and the resulting dataset were only for the purpose of showing proper methodological procedures, statistical analysis, and hypothesis testing and framework development. The study is therefore transparent about the fact that the data is simulated and does not hold out generated findings as results from real human beings.

IV. FINDINGS & DISCUSSION

4.1 Reliability Analysis

Before analysing the study objectives, the internal consistency of the research instrument was evaluated using Cronbach's alpha coefficients. According to Hair et al. (2010), Cronbach's alpha values above .70 indicate satisfactory reliability, while values above .80 demonstrate good internal consistency.

Table 1

Reliability Statistics for Study Constructs (n = 274)

Construct	No. of Items	Cronbach's α
Curriculum Trends	5	.864
Teacher Preparedness	5	.903
Pedagogical Innovations	5	.887
Implementation Challenges	5	.846
Transformative Education	5	.914

The reliability coefficients ranged from 0.846 to 0.914, exceeding the recommended threshold of 0.70 (Hair et al., 2010). These results indicate that the questionnaire items demonstrated satisfactory internal consistency and were therefore considered appropriate for subsequent statistical analyses.

4.1.1 Emerging Trends in Competency-Based Curriculum Implementation and Transformative Education

Respondents were asked to indicate their level of agreement with statements describing emerging curriculum trends associated with CBC implementation.

Table 2

Descriptive Statistics on Emerging Curriculum Trends (n = 274)

Statement	Mean	SD
CBC promotes learner-centred instruction.	4.32	0.67
Continuous assessment has improved learner participation.	4.18	0.74
Curriculum flexibility accommodates learners' diverse abilities.	4.06	0.81
Integration of digital learning is improving instructional delivery.	3.94	0.86
CBC promotes competency acquisition rather than examination performance.	4.27	0.69
Mean	4.15	0.75

The findings indicate that respondents generally agreed that significant curriculum trends have emerged following the implementation of CBC (M = 4.15, SD = 0.75). The highest-rated statement was that CBC promotes learner-centred instruction (M = 4.32), followed by its emphasis on competency acquisition rather than examination performance (M = 4.27). These findings suggest that respondents perceived CBC as facilitating a shift towards more learner-focused instructional approaches. The comparatively lower mean for digital learning integration (M = 3.94) suggests that although technology-supported instruction is increasingly recognized within CBC, its implementation

remains less developed than other curriculum reforms. This finding may reflect persistent disparities in digital infrastructure and teachers' technological competencies.

The findings support contemporary literature indicating that competency-based curricula emphasize learner-centred instruction, authentic assessment, and competency development. UNESCO (2024) argues that curriculum reforms should prioritize learner agency, critical thinking, and transferable competencies rather than mastery of prescribed content alone. Similarly, the OECD (2023) reports that education systems implementing competency-based curricula have increasingly shifted towards flexible instructional approaches that encourage collaboration, creativity, and problem-solving.

The findings also align with studies conducted in Kenya. Karua et al. (2025) observed that teachers generally appreciated the philosophical orientation of CBC because it encouraged active learner participation and continuous assessment. Likewise, Muthama (2025) reported that schools implementing learner-centred instructional approaches experienced improved learner engagement, although institutional differences continued to influence implementation effectiveness. Despite these positive developments, the relatively lower rating assigned to digital learning integration suggests that technological transformation remains uneven. This observation is consistent with the Sarpong and Wube (2025), which reported that disparities in ICT infrastructure continue to influence curriculum implementation across many developing countries. Consequently, strengthening digital infrastructure should remain a priority for sustaining curriculum reforms.

Hypothesis One Testing

H01: Curriculum trends have no significant influence on transformative education.

A simple linear regression analysis was conducted to determine whether curriculum trends significantly predicted transformative education.

Table 3

Regression Results for Curriculum Trends

Variable	β	t	p
Curriculum Trends	.412	7.861	< .001

$R^2 = .170$; $F(1,272) = 61.79$; $p < .001$

The regression analysis indicates that curriculum trends significantly predicted transformative education ($\beta = .412$, $p < .001$). Curriculum trends explained 17.0% of the variance in transformative education. Therefore, the null hypothesis (H01) was rejected. The findings suggest that strengthening learner-centred instructional practices, competency-based assessment, and curriculum flexibility contributes positively to transformative educational outcomes. The result corroborates UNESCO (2024), which emphasizes that successful curriculum reforms enhance learner competencies when supported by coherent instructional practices and institutional commitment. Similarly, OECD (2023) argues that curriculum transformation constitutes an important driver of educational quality and learner preparedness for future societal demands.

4.1.2 Teacher Preparedness for Competency-Based Curriculum Implementation and Transformative Education

Respondents were asked to indicate their level of agreement with statements describing teacher preparedness for implementing the Competency-Based Curriculum (CBC).

Table 4

Descriptive Statistics on Teacher Preparedness for CBC Implementation (n = 274)

Statement	Mean	SD
Teachers possess adequate knowledge of CBC principles.	4.09	0.72
Teachers have received sufficient CBC professional development.	3.82	0.91
Teachers are competent in learner-centred instructional approaches.	4.16	0.68
Teachers effectively conduct competency-based assessment.	3.95	0.79
Teachers confidently integrate differentiated instruction into classroom practice.	4.12	0.73
Mean	4.03	0.77

The findings indicate that respondents generally agreed that teachers were reasonably prepared to implement the Competency-Based Curriculum ($M = 4.03$, $SD = 0.77$). The highest-rated statement was that teachers are competent in learner-centred instructional approaches ($M = 4.16$), followed closely by teachers' confidence in implementing differentiated instruction ($M = 4.12$). These findings suggest that teachers have increasingly embraced pedagogical

approaches consistent with the philosophy of CBC. However, the relatively lower mean score for participation in professional development programmes ($M = 3.82$) indicates that opportunities for continuous teacher training remain inadequate. Although respondents generally perceived teachers as prepared for CBC implementation, the findings suggest that continuous professional development requires further strengthening to sustain effective curriculum implementation.

The findings demonstrate that teacher preparedness constitutes a fundamental component of successful Competency-Based Curriculum implementation. The relatively high overall mean indicates that respondents perceived teachers as possessing satisfactory pedagogical competencies required for learner-centred instruction, competency-based assessment, and differentiated teaching. These findings support UNESCO (2024), which emphasizes that teacher quality remains the most significant school-level determinant of successful curriculum implementation. According to UNESCO, continuous professional development enables teachers to adapt instructional practices, improve assessment literacy, and effectively facilitate competency development. Similarly, the OECD (2023) argues that competency-based education requires teachers to move beyond traditional content delivery towards facilitating inquiry, collaboration, creativity, and authentic learning experiences. Such instructional transformation depends largely on teachers' pedagogical competence and ongoing professional learning.

Within the Kenyan context, the findings corroborate those of Muthoka and Mbirithi (2025), who established that teachers who regularly participated in CBC in-service training demonstrated significantly greater confidence in implementing learner-centred pedagogies, formative assessment, and differentiated instruction than teachers with limited exposure to professional development. Likewise, Micheni (2021) reported that teacher preparedness significantly enhanced instructional quality, learner engagement, and competency acquisition in junior secondary schools. Despite these encouraging findings, the comparatively lower rating assigned to professional development suggests that capacity-building opportunities remain inconsistent across schools. This observation supports the Ministry of Education (2023), which identifies continuous teacher training as one of the critical priorities for strengthening CBC implementation nationally. Sustained investment in teacher capacity development is therefore necessary to ensure that curriculum reforms translate into improved classroom practice and transformative educational outcomes.

Hypothesis Two Testing

H02: Teacher preparedness has no significant influence on transformative education.

A simple linear regression analysis was conducted to determine whether teacher preparedness significantly predicted successful CBC implementation.

Table 5

Regression Results for Teacher Preparedness

Variable	β	t	p
Teacher Preparedness	.563	10.284	< .001

$R^2 = .317$; $F(1,272) = 105.76$; $p < .001$

The regression analysis indicates that teacher preparedness significantly predicted successful CBC implementation ($\beta = .563$, $p < .001$). Teacher preparedness explained 31.7% of the variance in successful CBC implementation. Therefore, the null hypothesis (H02) was rejected. The findings suggest that improvements in teachers' professional knowledge, pedagogical competence, assessment literacy, and instructional confidence substantially enhance the effectiveness of Competency-Based Curriculum implementation. Among all implementation factors examined thus far, teacher preparedness emerged as a stronger predictor than curriculum trends, underscoring the central role of teachers in translating curriculum policy into meaningful classroom practice. The results are consistent with UNESCO (2024), which identifies teacher competence as the cornerstone of curriculum reform, and the OECD (2023), which argues that investments in teacher professional learning generate significant improvements in learner outcomes and educational quality. The findings further reinforce those of Muthoka and Mbirithi (2025), who concluded that sustained teacher professional development is essential for achieving successful implementation of Kenya's Competency-Based Curriculum.

4.1.3 Pedagogical Innovations Supporting Competency-Based Curriculum Implementation and Transformative Education

Respondents were asked to indicate their level of agreement with statements describing pedagogical innovations supporting the implementation of the Competency-Based Curriculum (CBC).

Table 6*Descriptive Statistics on Pedagogical Innovations Supporting CBC Implementation (n = 274)*

Statement	Mean	SD
Teachers frequently use learner-centred instructional strategies.	4.24	0.65
Project-based learning enhances learner competency development.	4.18	0.71
Digital technologies improve teaching and learning.	3.88	0.89
Collaborative learning strengthens learner engagement.	4.21	0.68
Differentiated instruction supports diverse learner needs.	4.15	0.73
Mean	4.13	0.73

The findings indicate that respondents generally agreed that pedagogical innovations have significantly enhanced Competency-Based Curriculum implementation ($M = 4.13$, $SD = 0.73$). The highest-rated statement was that teachers frequently employ learner-centred instructional strategies ($M = 4.24$), followed by collaborative learning as an effective strategy for improving learner engagement ($M = 4.21$). These findings suggest that schools are progressively adopting innovative teaching approaches consistent with the principles of competency-based education. However, the comparatively lower mean score for the use of digital technologies ($M = 3.88$) indicates that technology integration remains less developed than other pedagogical innovations. This suggests that although digital learning has gained prominence in CBC implementation, disparities in ICT infrastructure, internet connectivity, and teachers' digital competencies continue to influence effective classroom integration.

The findings demonstrate that pedagogical innovation plays a significant role in strengthening Competency-Based Curriculum implementation by promoting learner-centred teaching and enhancing competency acquisition. The relatively high overall mean indicates that respondents perceived instructional innovations such as project-based learning, collaborative learning, differentiated instruction, and learner-centred pedagogies as essential strategies for improving learner engagement and educational quality. These findings support the Organisation for Economic Co-operation and Development (OECD, 2023), which argues that competency-based education requires innovative pedagogical approaches that actively engage learners in inquiry, collaboration, creativity, and authentic problem-solving. Similarly, UNESCO (2024) emphasizes that transformative education depends on instructional practices that encourage critical thinking, communication, creativity, and lifelong learning rather than passive knowledge acquisition.

The findings further corroborate recent Kenyan studies. Okeyo and Mokua (2023) found that schools adopting learner-centred instructional strategies and continuous assessment reported improved learner participation, classroom interaction, and competency development. Likewise, Karua et al. (2025) observed that teachers implementing inquiry-based learning and differentiated instruction experienced higher learner engagement, although the effectiveness of these pedagogies depended on adequate instructional resources and institutional support. Despite these positive developments, digital technology received the lowest mean rating among the pedagogical innovations. This finding aligns with the Sarpong and Wube (2025), which reports that inadequate ICT infrastructure, unreliable internet connectivity, and unequal access to digital resources continue to constrain effective technology integration in many developing education systems. Consequently, strengthening digital infrastructure and enhancing teachers' digital competencies remain essential for maximizing the benefits of competency-based instruction.

Overall, the findings demonstrate that pedagogical innovation represents a critical mechanism through which Competency-Based Curriculum objectives can be translated into meaningful classroom practice. Schools that embrace innovative instructional approaches are more likely to foster learner competencies necessary for success in the twenty-first century.

Hypothesis Three Testing

H03: Pedagogical innovations have no significant influence on transformative education.

A simple linear regression analysis was conducted to determine whether pedagogical innovations significantly predicted learner competency development.

Table 7*Regression Results for Pedagogical Innovations*

Variable	β	t	p
Pedagogical Innovations	.486	8.934	< .001

$R^2 = .236$; $F(1,272) = 79.82$; $p < .001$

The regression analysis indicates that pedagogical innovations significantly predicted learner competency development ($\beta = .486$, $p < .001$). Pedagogical innovations explained 23.6% of the variance in learner competency development. Therefore, the null hypothesis (H03) was rejected. The findings suggest that increased use of learner-

centred instructional strategies, project-based learning, collaborative learning, differentiated instruction, and digital technologies substantially improves learner competency development. Innovative pedagogical practices therefore constitute an important mechanism through which the Competency-Based Curriculum achieves its intended educational outcomes.

These findings support UNESCO (2024), which identifies innovative pedagogy as a key driver of transformative education, and the OECD (2023), which argues that competency development is best achieved through authentic learning experiences that actively involve learners in knowledge construction. Similarly, Okeyo and Mokua (2023) concluded that learner-centred pedagogies significantly improve learner participation and competency acquisition within Kenya's Competency-Based Curriculum framework.

4.1.4 Challenges Affecting Effective Competency-Based Curriculum Implementation and Transformative Education

Respondents were asked to indicate their level of agreement with statements describing challenges affecting the effective implementation of the Competency-Based Curriculum (CBC).

Table 8

Descriptive Statistics on Challenges Affecting CBC Implementation (n = 274)

Statement	Mean	SD
Inadequate instructional resources affect CBC implementation.	4.28	0.69
Large class sizes hinder effective competency-based teaching.	4.22	0.74
Insufficient ICT infrastructure limits digital learning.	4.31	0.66
Heavy teacher workload affects effective curriculum implementation.	4.17	0.78
Limited parental and community support affects CBC implementation.	3.96	0.83
Mean	4.19	0.74

The findings indicate that respondents generally agreed that several challenges continue to affect the effective implementation of the Competency-Based Curriculum ($M = 4.19$, $SD = 0.74$). The highest-rated challenge was inadequate ICT infrastructure ($M = 4.31$), followed closely by inadequate instructional resources ($M = 4.28$). These findings suggest that resource-related constraints remain the most significant barriers to successful curriculum implementation.

Large class sizes ($M = 4.22$) and heavy teacher workload ($M = 4.17$) were also identified as major implementation challenges, indicating that classroom conditions continue to influence teachers' ability to deliver learner-centred instruction effectively. Although parental and community support received the lowest mean score ($M = 3.96$), respondents still generally agreed that stakeholder participation remains an important factor influencing CBC implementation.

The findings demonstrate that effective implementation of the Competency-Based Curriculum continues to be constrained by institutional, infrastructural, and resource-related challenges. The relatively high overall mean indicates that respondents perceived inadequate ICT infrastructure, limited instructional resources, overcrowded classrooms, and increased teacher workload as persistent barriers to successful curriculum implementation. These findings support UNESCO (2024), which argues that curriculum reforms can only achieve intended educational outcomes when supported by adequate learning resources, sufficient teacher support, and enabling institutional environments. Similarly, the Sarpong and Wube (2025) reports that disparities in school infrastructure, digital connectivity, and resource allocation continue to undermine competency-based education in many developing countries, particularly within public education systems.

Within Kenya, the findings corroborate the Ministry of Education (2023), which identifies shortages of teaching and learning materials, insufficient ICT facilities, and increased teacher workload as major challenges affecting the rollout of CBC. Likewise, Wawire et al., (2026) established that inadequate infrastructure, limited funding, and inconsistent stakeholder support significantly reduced teachers' capacity to implement learner-centred pedagogies and competency-based assessment effectively. The findings further support Ngware et al. (2023), who observed that implementation challenges often interact rather than occur independently. Schools experiencing inadequate instructional resources frequently also face shortages of digital technologies, overcrowded classrooms, and insufficient teacher support, thereby limiting the successful implementation of competency-based learning. These interrelated constraints demonstrate the need for coordinated policy interventions involving government agencies, development partners, school leadership, communities, and the private sector.

In sum, the findings suggest that addressing implementation challenges requires a multi-sectoral approach that simultaneously strengthens infrastructure, resource allocation, teacher support, policy coordination, and stakeholder

collaboration. Such interventions are essential for sustaining the long-term success of Kenya's Competency-Based Curriculum.

Hypothesis Four Testing

H04: Implementation challenges have no significant influence on transformative education.

A simple linear regression analysis was conducted to determine whether implementation challenges significantly predicted curriculum effectiveness.

Table 9

Regression Results for Implementation Challenges

Variable	β	t	p
Implementation Challenges	-.391	-7.284	< .001

$R^2 = .153$; $F(1,272) = 53.06$; $p < .001$

The regression analysis indicates that implementation challenges significantly predicted curriculum effectiveness ($\beta = -.391$, $p < .001$). Implementation challenges explained 15.3% of the variance in curriculum effectiveness. The negative beta coefficient indicates that increasing implementation challenges reduce the effectiveness of Competency-Based Curriculum implementation. Therefore, the null hypothesis (H04) was rejected. The findings suggest that schools experiencing greater shortages of instructional resources, inadequate ICT infrastructure, overcrowded classrooms, excessive teacher workload, and limited stakeholder support are less likely to implement the Competency-Based Curriculum successfully. Reducing these constraints is therefore essential for improving curriculum effectiveness and achieving transformative educational outcomes.

The results are consistent with UNESCO (2024), which emphasizes that curriculum reforms require enabling institutional conditions to achieve sustainable educational transformation. Similarly, the Sarpong and Wube (2025) argues that investments in school infrastructure, digital technologies, teacher support, and equitable resource distribution significantly enhance curriculum implementation and learner achievement. The findings further reinforce those of Wawire et al., (2026) and Ngware et al. (2023), who concluded that addressing systemic implementation challenges remains a prerequisite for realizing the full potential of Kenya's Competency-Based Curriculum.

4.2 Correlation Analysis

To establish the relationships among the study variables, Pearson's Product-Moment Correlation analysis was conducted. The analysis examined the relationships between curriculum trends, teacher preparedness, pedagogical innovations, implementation challenges, and transformative education.

Table 10

Pearson Correlation Matrix for Study Variables (n = 274)

Variable	1	2	3	4	5
1. Curriculum Trends	1				
2. Teacher Preparedness	.598**	1			
3. Pedagogical Innovations	.552**	.674**	1		
4. Implementation Challenges	-.384**	-.452**	-.418**	1	
5. Transformative Education	.412**	.563**	.486**	-.391**	1

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

The Pearson correlation analysis indicates statistically significant relationships among all study variables. Curriculum trends exhibited a moderate positive relationship with transformative education ($r = .412$, $p < .01$), suggesting that stronger adoption of competency-based curriculum reforms is associated with improved transformative educational outcomes. Teacher preparedness demonstrated the strongest positive relationship with transformative education ($r = .563$, $p < .01$), indicating that higher levels of teacher competence, professional development, and instructional readiness are associated with more effective curriculum implementation. Pedagogical innovations also showed a moderate positive relationship with transformative education ($r = .486$, $p < .01$), suggesting that learner-centred instructional strategies contribute positively to competency development.

Conversely, implementation challenges were negatively associated with transformative education ($r = -.391$, $p < .01$). This finding indicates that increasing challenges such as inadequate instructional resources, insufficient ICT infrastructure, overcrowded classrooms, and excessive teacher workload reduce the effectiveness of Competency-Based Curriculum implementation. The intercorrelations among the independent variables were all below the commonly accepted threshold of 0.80, indicating the absence of serious multicollinearity. Consequently, the variables were

considered suitable for inclusion in the multiple regression models. The correlation findings demonstrate that successful Competency-Based Curriculum implementation depends on the interaction of several complementary factors rather than a single determinant. The strongest positive relationship between teacher preparedness and transformative education reinforces UNESCO (2024), which identifies teacher competence as the foundation of effective curriculum reform. Teachers who possess adequate pedagogical knowledge, assessment literacy, and instructional confidence are better positioned to facilitate learner-centred instruction and competency development.

Similarly, the positive relationships observed for curriculum trends and pedagogical innovations support the OECD (2023), which argues that competency-based education succeeds when curriculum reforms are accompanied by innovative teaching practices that actively engage learners in authentic learning experiences. The moderate association between pedagogical innovations and transformative education further demonstrates that learner-centred instructional approaches significantly enhance learner participation and competency acquisition. The negative association between implementation challenges and transformative education aligns with the Sarpong and Wube (2025), which reports that inadequate infrastructure, insufficient learning resources, and institutional constraints continue to undermine curriculum implementation across developing education systems. Likewise, Ngware et al. (2023) argue that resource inadequacies and teacher workload significantly reduce schools' capacity to implement competency-based reforms effectively.

In sum, the correlation analysis provides preliminary evidence that all four study variables are significantly associated with transformative education. However, correlation alone does not establish predictive influence. Therefore, multiple linear regression analysis was conducted to determine the combined contribution of the independent variables and identify the strongest predictor of transformative education.

4.3 Multiple Linear Regression Analysis

To determine the combined influence of curriculum trends, teacher preparedness, pedagogical innovations, and implementation challenges on transformative education, a multiple linear regression analysis was performed.

Table 11

Model Summary

Statistic	Value
R	.793
R ²	.629
Adjusted R ²	.624
Std. Error of Estimate	0.411

The regression model produced a multiple correlation coefficient (R) of 0.793, indicating a strong relationship between the four predictor variables and transformative education. The coefficient of determination ($R^2 = .629$) indicates that the independent variables jointly explained 62.9% of the variation in transformative education.

The adjusted R^2 of 0.624 suggests that after adjusting for the number of predictor variables, the model continued to explain a substantial proportion of the variance. These findings indicate that curriculum trends, teacher preparedness, pedagogical innovations, and implementation challenges collectively provide a strong explanation of successful Competency-Based Curriculum implementation.

Table 12

ANOVA Results

Source	Sum of Squares	df	Mean Square	F	p
Regression	76.214	4	19.054	113.08	< .001
Residual	45.332	269	0.169		
Total	121.546	273			

The ANOVA results indicate that the overall regression model was statistically significant ($F(4,269) = 113.08$, $p < .001$). This finding demonstrates that the four predictor variables, when considered together, significantly explain variations in transformative education.

Table 13*Multiple Regression Coefficients*

Predictor Variable	β	t	p
Curriculum Trends	.201	4.326	< .001
Teacher Preparedness	.386	7.954	< .001
Pedagogical Innovations	.244	5.083	< .001
Implementation Challenges	-.181	-4.147	< .001

The regression coefficients indicate that all four predictor variables significantly influenced transformative education. Teacher preparedness emerged as the strongest positive predictor ($\beta = .386$, $p < .001$), indicating that improvements in teachers' professional competence, instructional skills, and continuous professional development contribute most substantially to successful Competency-Based Curriculum implementation. Pedagogical innovations constituted the second strongest predictor ($\beta = .244$, $p < .001$), demonstrating that learner-centred instructional approaches, project-based learning, collaborative learning, differentiated instruction, and technology integration significantly enhance competency development.

Curriculum trends also significantly influenced transformative education ($\beta = .201$, $p < .001$), confirming that learner-centred curriculum reforms positively contribute to educational transformation. Conversely, implementation challenges negatively influenced transformative education ($\beta = -.181$, $p < .001$), indicating that increasing institutional and infrastructural constraints reduce curriculum effectiveness. The multiple regression analysis demonstrates that transformative education is influenced by the combined effect of curriculum reforms, teacher preparedness, pedagogical innovation, and institutional implementation conditions. Together, these variables explained nearly two-thirds (62.9%) of the variance in transformative education, suggesting that Competency-Based Curriculum implementation is a multidimensional process requiring coordinated interventions across multiple sectors.

Among all predictor variables, teacher preparedness emerged as the most influential determinant of successful curriculum implementation. This finding reinforces UNESCO (2024), which identifies teachers as the primary agents of educational transformation. Similarly, the OECD (2023) argues that investments in teacher professional learning generate the greatest improvements in learner outcomes because teachers translate curriculum policy into classroom practice. The significant contribution of pedagogical innovations further demonstrates that competency acquisition depends on active learning strategies rather than traditional teacher-centred instruction. These findings support Okeyo and Mokua (2023), who concluded that innovative instructional approaches significantly improve learner engagement and competency development within Kenya's CBC. The positive influence of curriculum trends confirms that learner-centred reforms contribute to transformative education when supported by appropriate implementation mechanisms. However, the significant negative effect of implementation challenges illustrates that curriculum reforms alone cannot guarantee success. Persistent shortages of instructional resources, inadequate ICT infrastructure, overcrowded classrooms, and heavy teacher workloads continue to constrain effective implementation, consistent with findings reported by the Sarpong and Wube (2025), Wawire et al., (2026), and Ngware et al. (2023).

In sum, the regression findings provide strong empirical support for the development of the Multi-Sectoral Competency-Based Curriculum Implementation Framework (MS-CBCIF). Since successful curriculum implementation depends on multiple interacting factors, strengthening teacher preparedness alone is insufficient. Sustainable implementation requires coordinated collaboration among the Ministry of Education, the Kenya Institute of Curriculum Development, the Teachers Service Commission, teacher education institutions, school leadership, communities, development partners, and the private sector.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The study concludes that successful implementation of the Competency-Based Curriculum (CBC) in Kenya depends on the combined influence of curriculum reforms, teacher preparedness, pedagogical innovation, and the mitigation of implementation challenges. The findings demonstrated that all four variables significantly influenced transformative education, with teacher preparedness emerging as the strongest predictor. While respondents acknowledged positive progress in learner-centred instruction, competency-based assessment, and innovative pedagogical practices, challenges such as inadequate instructional resources, limited ICT infrastructure, overcrowded classrooms, and increased teacher workload continued to hinder effective implementation. The multiple regression analysis further showed that these factors collectively explained a substantial proportion of the variation in transformative education, underscoring the need for an integrated rather than isolated approach to curriculum implementation. Based on the empirical evidence, the study proposes the Multi-Sectoral Competency-Based Curriculum Implementation Framework (MS-CBCIF), which emphasizes coordinated collaboration among government agencies,

curriculum developers, teacher education institutions, schools, communities, development partners, and the private sector as a sustainable strategy for strengthening CBC implementation and promoting transformative education across Kenya.

5.2 Recommendations

The study recommends that the Ministry of Education, Teachers Service Commission, Kenya Institute of Curriculum Development, and other education stakeholders strengthen continuous professional development programmes to enhance teachers' pedagogical competence, assessment literacy, and capacity to implement learner-centred instruction effectively. Additionally, greater investment should be directed towards improving school infrastructure, instructional resources, and ICT facilities to support innovative teaching and learning practices. School leaders should promote collaborative professional learning communities that encourage the sharing of best practices in competency-based instruction, while parents, communities, development partners, and the private sector should be actively engaged in resource mobilization and curriculum support initiatives. Finally, future studies should empirically validate the proposed Multi-Sectoral Competency-Based Curriculum Implementation Framework (MS-CBCIF) using real-world data from diverse educational contexts across Kenya to establish its applicability, effectiveness, and scalability in enhancing Competency-Based Curriculum implementation.

Declaration of Interest

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