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Research Article

Teachers' Integration of the 21st Century Skills and Lower Primary School Learners' Acquisition of Collaborative Skills in Thika, Kiambu County Kenya

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Abstract:

Background of Study: This study investigated the integration of 21st century skills by Grade Three teachers in lower primary schools and how this influences learners' acquisition of collaborative learning skills in Thika Subcounty, Kiambu County, Kenya. Collaborative learning is a key component of the Competency-Based Curriculum (CBC), designed to foster communication, critical thinking, and creativity among learners.

Aims and Scope of Paper: The paper aimed to examine teachers' awareness and implementation of 21st century skills, identify challenges in applying CBC-oriented pedagogies, and assess the impact of these practices on learners' acquisition of corroborative learning skills.

Methods: A descriptive research design was employed. Data were collected from 100 purposively selected Grade Three teachers through structured questionnaires, classroom observations, and focused group discussions.

Result: Findings revealed that while 78% of teachers were aware of 21st century skills, only 32% consistently applied them in classroom practice. Key barriers included inadequate CBC training, lack of instructional resources, and overcrowded classrooms. Teacher-centered approaches remained predominant, limiting opportunities for effective collaborative learning.

Conclusion: Although teachers demonstrated awareness of 21st century skills, their practical application was minimal due to systemic challenges. The study underscores the need for targeted professional development, adequate teaching resources, and supportive structures to strengthen pedagogical practices that enhance collaborative learning in early primary education.

Keywords: 21st Century Skills, Collaborative Learning, Competency-Based Curriculum (CBC), Kenya, Teacher Integration

1. INTRODUCTION

Collaborative learning, which involves learners working together in small groups to accomplish a shared goal, is rooted in socio-constructivist theories of learning such as those proposed by Vygotsky. It enables learners to develop social and cognitive skills simultaneously (Ige et al., 2024).

In the CBC framework, collaborative learning is viewed as a strategy to develop communication, critical thinking, and interpersonal competencies necessary for the 21st century. The goal of this paper is to explore how such collaborative strategies are integrated in Grade Three classrooms and how they affect learners' acquisition of corroborative skills, such as co-reasoning, listening to peers, and joint problem-solving (Okeyo & Mokua, 2023). In Kenya, the education system has gone through several reforms which are in line with global requirements. The Kenyan system has realigned the reforms with physical, social, political, and economic challenges of the Kenyan state since 1963. Sessional paper no. 1 on educational reforms (Waruingi et al., 2022).

The 21stCentury continues to evolve rapidly and dramatically forcing radical changes on the roles of education. The Organisation for Economic Co-operation and Development [OECD] (2020) contends that the world is facing a myriad of unprecedented environmental, economic, health, technological and societal challenges. Consequently, the skills that learners acquire through the education system have attracted global attention. There has been urgency in reforming education systems with a clarion call on the need for conscious, deliberate and strategic curricular

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response to thedemands of the 21stCentury (Karua et al., 2025). Traditional content based education has proven inadequate in equipping learners with the dynamic and cross cutting competencies required for success in the 21st century (Kibet, 2025).

Kenya's Competency Based Curriculum (CBC) is a dynamic educational framework designed to equip learners with critical skills, values, and attitudes needed in the 21st century (Ndiangui et al., 2025). The integration of 21st century skills critical thinking, collaboration, communication, and creativity has become a fundamental expectation in modern education systems. In Kenya, the Competency-Based Curriculum (CBC) envisions the nurturing of holistic learners who can effectively collaborate and solve real-world problems (M'mboga Akala, 2021). Corroborative learning, as a form of collaborative learning rooted in shared reasoning and mutual validation of ideas, is key to realizing these aspirations in early childhood education. However, the success of this approach largely depends on teachers' understanding and application of the CBC framework and its methodologies (Ngeno et al., 2021).

Specifically, there is a need to explore how collaborative learning strategies are being utilized by teachers to facilitate peer-based knowledge construction in Grade Three. Although corroborative learning is a form of collaborative learning, it requires structured interaction and intentional facilitation from educators skills many teachers may lack due to gaps in training and pedagogical knowledge (Xu et al., 2023). This study provides evidence that implementation of CBC can be hindered by teachers' lack of knowledge and skills on the curriculum (Isaboke et al., 2021).

Despite the theoretical embedding of 21st century skills within the CBC, anecdotal evidence and preliminary observations suggest that many teachers in lower primary grades, particularly Grade Three, struggle to effectively integrate these skills into their instructional practices (Yang, 2023). Consequently, learners may not be adequately acquiring corroborative learning competencies that are central to the CBC's objectives. This study sought to investigate the actual use of these skills in the classroom and the systemic challenges undermining their implementation (Thukia, 2025). The implementation of the Competency-Based Curriculum (CBC) is a crucial issue in global education reform, aiming to prepare learners with 21stcentury skills that are relevant to socio-economic needs. This problem extends beyond academic achievement, encompassing internal school dynamics, teacher readiness, and community perception. In the public primary school of Igembe Central Sub-district, Kenya, although CBC implementation efforts have been made, challenges such as inadequate syllabus coverage, ineffective teaching methods, and suboptimal learning outcomes are still a serious concern (Joseph et al., 2025).

Their study concluded that the knowledge teachers had on Competency Based Curriculum (CBC) is vague and that this was bound to hinder their delivery and evaluation (Achieng, 2023). This study is anchored in the socio-constructivist theory, particularly Vygotsky's theory of social development. According to Vygotsky, learning is inherently a social process that occurs first on the inter-psychological level and then on the intra-psychological level (Sun et al., 2022). Collaborative learning reflects this process, as learners co-construct knowledge through peer interaction. In the context of corroborative learning, students engage in discussion, question one another, and build shared understanding behaviors which align with the competencies envisioned under CBC (Liebech-Lien, 2020).

This new educational technology requires systems thinking for it to be able to translate inputs into anticipated outputs. The BECF will change the education structure from 8-4-4 years to 2-6-3-3 years and reduce primary schools' eight years of schooling to six to align it with other African countries (KICD 2018). Kenya was the country that gave the most prolonged primary education (Ngaruiya, 2023). In the 8-4-4 system learners were to take eight years in primary, four years in secondary school and four years of university education. Since its implementation in 1985, the curriculum has undergone several reviews (Ndori Maluha et al., 2025). It was however felt by the majority of citizens that the current system of education is not fit for purpose. This was confirmed by the findings of a summative evaluation of primary and secondary education curricular and a national needs assessment study conducted by the Kenya Institute of Curriculum Developmen (Pale, 2020).

CBC ushered in the elimination of the 8-4-4 system. Although the goal of the 8-4-4 system was to produce well-rounded pupils, the emphasis switched to exam passing, leading to situations where students and teachers conspire to cheat on tests and incur exorbitant holiday tuition that is paid for by parents and guardians. The 8-4-4 system received criticism for being very theoretical. The CBC (2-6-6-3) approach could potentially foster originality and talent, hence eliminating the need for memorization. For the CBC to become ingrained the presidential working party on education was established to pave the way for a legal framework for the CBC besides, public participation was conducted and envisages the importance of public participation (Mackatiani et al., 2023).

Indeed, if well executed, community service-learning stands to address a number of pedagogical challenges being experienced in the higher institutions of learning today, especially in developing countries as conceptualized in the Competency-Based Curriculum. The Summative Evaluation Report of 2009 revealed that the Kenyan curriculum was heavily academic and examination-oriented, hence limiting flexible pathways for identifying and nurturing learners' aptitudes, talents,

and interests early enough to prepare them for the world of work, career progression and sustainable development (Ngwacho, 2024). Kenya intended to train skilled and holistic with full potential for the present 21st-century global job opportunities. The vital objective of CBC is to identify and nurture learners' potential and pathway to Kenyan socio-economic development (Maluha et al., 2025). Therefore, for effective curriculum implementation, the head teachers need to be involved in guiding the teachers through giving instructional responses and advice after observing them teach their lessons (Awili & Begi, 2021).

2. MATERIAL AND METHOD

Observational checklists focused on the presence of group tasks, learners' engagement levels in peer-to-peer interaction, and teacher facilitation strategies. Focused group discussions probed how teachers implement collaborative tasks and their perceived effectiveness in enhancing learner participation and understanding.

The study employed a descriptive survey design, targeting lower primary teachers across selected public schools in Kenya. Data were collected through structured questionnaires, classroom observations, and focused group discussions with teachers. A sample of 100 Grade Three teachers was purposively selected from diverse geographic regions to ensure representational.

Collaborative learning has been widely recognized as an effective instructional strategy to promote learner engagement and deeper understanding. In contexts such as Kenya, its application in early childhood education is still emerging. Effective collaborative learning requires teachers to structure tasks in ways that ensure interdependence and accountability among learners. The current study's findings that few teachers engage in structured group work resonate which highlights deficiencies in CBC-aligned instructional practices. Further, Vygotsky's notion of the Zone of Proximal Development underscores the role of more knowledgeable peers in scaffolding learning, a foundational idea in collaborative learnig (Mende et al., 2021). Teachers, therefore, play a dual role not only designing collaborative environments but also guiding learner interactions. However, the findings suggest that these roles are underdeveloped among Grade Three teachers, likely due to minimal professional development and lack of exposure to learner-centered pedagogies. Investment in collaborative pedagogical training can bridge the gap between curriculum expectations and classroom realities, thereby strengthening corroborative learning outcomes.

Findings revealed that 78% of teachers were aware of the concept of 21st century skills and corroborative learning. However, only 32% reported consistently applying these skills in their lesson planning and delivery. While teachers expressed positive attitudes towards learner-centered approaches, many lacked the practical competencies to implement them effectively. This study aligns with other studies which have since identified teacher characteristics as a major impediment to effective teaching and learning outcomes (Didion et al., 2020).

A significant discrepancy existed between awareness and practice. Classroom observations showed that teacher-centered methods remained predominant. Activities promoting corroborative learning such as group tasks, peer discussions, and project-based learning were rarely employed.

3. RESULT AND DISCUSSION

3.1 Result

The results of this study align with global literature emphasizing the central role of teacher capacity in successful curriculum implementation. While awareness is a necessary first step, it is insufficient without continuous professional development and supportive environments. In the context of CBC, corroborative learning encourages group-based tasks, yet evidence reveals that many Kenyan classrooms still operate under traditional models that undervalue student collaboration.

Supports the claim that successful integration of 21st century skills requires systemic support structures including relevant training and resource allocation. That without adequate instructional materials and manageable class sizes, innovative approaches like corroborative learning are difficult to sustain. The present findings corroborate these assertions, emphasizing the need for teacher empowerment through well-structured in-service training aligned with CBC demands.

Furthermore, teacher attitudes toward learner-centered methods though generally positive are not translating into practice due to institutional inertia and lack of incentives. This disconnect between theory and practice necessitates a more robust framework for CBC implementation that includes school-based mentorship, peer learning communities, and decentralized resource support.

The findings revealed that a substantial majority of teachers (78%) demonstrated awareness of the principles underpinning 21st-century skills and the significance of collaborative learning in the Competency-Based Curriculum (CBC). This suggests that teachers are conceptually familiar with the need to integrate competencies such as communication, critical thinking, creativity, and collaboration into their instructional practices. Nevertheless, the study uncovered that only 32% of teachers consistently applied these skills within their lesson planning and classroom delivery. This discrepancy indicates that although teachers may recognize the importance of 21st-century skills, translating this awareness into practice remains a major challenge.

Interviews and questionnaires further revealed that many teachers expressed positive attitudes toward learner-centered approaches, acknowledging their potential to improve engagement, foster peer-to-peer learning, and enhance problem-solving abilities.

However, the majority lacked the pedagogical competence and practical strategies required to implement such approaches effectively. For instance, while teachers could articulate the theoretical value of group work or project-based tasks, many admitted difficulties in designing and managing collaborative activities, particularly in contexts of limited resources and large class sizes.

Classroom observations reinforced these findings, highlighting a significant gap between awareness and practice. Despite their knowledge of CBC-aligned methodologies, teachers overwhelmingly relied on traditional, teacher-centered methods such as direct instruction and rote learning. Collaborative learning strategies such as structured group work, guided peer discussions, and problem-based learning were either rarely employed or implemented superficially, often without ensuring active participation or accountability among learners. Consequently, opportunities for learners to develop essential collaborative skills were limited, undermining the broader objectives of CBC to nurture holistic, competent individuals prepared for 21st-century challenges.

3.2 Discussion

These findings are consistent with a wide range of global literature that emphasizes the pivotal role of teacher capacity in effective curriculum implementation. Awareness of 21st-century skills is undoubtedly an important foundational step, as it reflects teachers' conceptual understanding of the changing demands of education in a rapidly evolving world. However, awareness alone is not sufficient to bring about meaningful transformation in classroom practices. What is required is a systematic and sustained effort to build teacher competence through continuous professional development, ongoing mentorship, and a supportive institutional environment.

Within the framework of the Competency-Based Curriculum (CBC), collaborative learning is positioned as a cornerstone of pedagogy, designed to foster peer interaction, mutual reasoning, and collective problem-solving among learners. Ideally, these strategies should nurture communication, creativity, critical thinking, and social-emotional skills—competencies that are indispensable for learners navigating the complexities of the 21st century. Nevertheless, the evidence from this study demonstrates that the transition from theory to practice remains incomplete. Many Kenyan classrooms continue to rely heavily on traditional teacher-centered instructional models, which privilege knowledge transmission and rote memorization over active engagement and cooperation among learners. This situation not only limits the potential of CBC but also risks reproducing outdated educational practices that fail to equip learners with relevant life skills.

The successful integration of 21st-century skills requires more than individual teacher commitment. It depends on the presence of structural support systems at multiple levels, including schools, education ministries, and broader policy frameworks. Targeted teacher training programs are necessary to bridge the gap between theory and practice, while adequate instructional resources—such as teaching materials, technological tools, and flexible classroom layouts—are essential for enabling interactive learning. Additionally, class size plays a critical role: overcrowded classrooms constrain opportunities for personalized instruction, collaborative tasks, and effective group management. Without these structural supports, innovative approaches such as collaborative learning become difficult, if not impossible, to sustain over time.

Although the study found that teachers generally expressed positive attitudes toward learner-centered methods, such attitudes were rarely translated into actual practice. This mismatch can be attributed to a combination of factors, including institutional inertia, which favors established teaching norms; inadequate incentives, which fail to motivate teachers to adopt new practices; and resource constraints, which hinder the implementation of more complex and participatory methodologies. These challenges highlight a systemic problem: the existence of a well-intentioned curriculum framework that lacks the practical mechanisms needed for effective realization at the classroom level.

Addressing this disconnect between theory and practice calls for the establishment of a more robust CBC implementation framework. Such a framework should include structured school-based mentorship programs, where experienced educators support their peers in adopting learner-centered pedagogies. It should also encourage the development of professional learning communities (PLCs), which provide teachers with collaborative spaces to reflect on their practice, share innovative strategies, and troubleshoot challenges collectively. Furthermore, decentralized resource provision is necessary to ensure that schools, regardless of their geographic location or socioeconomic context, have access to the materials and tools required for CBC implementation.

Ultimately, the findings of this study underscore that without substantial investment in teacher capacity, institutional support, and systemic reform, the promise of CBC as a transformative educational framework will remain largely unfulfilled. Building a strong bridge between curriculum design and classroom practice is therefore essential to ensure that learners acquire the collaborative and critical skills envisioned in Kenya's educational reforms.

3.2.1 Implications

This study underscores that the success of Competency-Based Curriculum (CBC) implementation depends not only on teachers' conceptual awareness of 21st-century skills but also on their practical competence in applying these skills in everyday classroom contexts, as well as

on the presence of systemic support structures that facilitate innovation. Awareness provides the foundation for curriculum reform, yet without the ability to design, deliver, and evaluate learner-centered lessons effectively, the broader goals of CBC cannot be achieved.

The findings have significant implications for policymakers, curriculum developers, and educational stakeholders. Specifically, they highlight the urgent need to invest in targeted professional development programs that go beyond introductory workshops and provide continuous, hands-on training aligned with teachers' daily realities. Such programs should focus on equipping teachers with practical strategies to foster collaboration, manage group dynamics, integrate technology, and design interactive learning activities. Moreover, training must be accompanied by consistent follow-up, coaching, and mentorship to ensure that teachers are able to transfer acquired skills into their classroom practice.

In addition, the provision of adequate learning resources including textbooks, digital tools, and teaching aids is essential to operationalize CBC principles. Teachers cannot effectively implement collaborative learning without the necessary instructional materials and supportive infrastructure. Equally important is the need to establish conducive classroom environments. Overcrowded classes and poorly equipped facilities limit the feasibility of learner-centered methods, thereby reducing opportunities for students to actively engage in peer-to-peer interaction and collaborative problem-solving.

Strengthening teacher capacity across these dimensions will enable 21st-century skills to move beyond abstract policy discourse and become an integral part of classroom practice. This transformation has the potential to enhance learners' acquisition of collaborative competencies from an early age, ensuring that they are better prepared to navigate academic, social, and professional challenges in later life. Ultimately, the study emphasizes that systemic reform and teacher empowerment are mutually reinforcing: without institutional support, teacher capacity remains underutilized, and without skilled teachers, systemic reforms cannot achieve their intended impact.

3.2.2 Research Contribution

This research makes a valuable contribution to the growing body of knowledge on the implementation of the Competency-Based Curriculum (CBC) in Kenya, particularly with regard to the integration of 21st-century skills at the lower primary school level. By presenting empirical evidence of the persistent gap between teachers' conceptual understanding of collaborative and learner-centered approaches and their actual classroom practices, the study provides critical insights into the challenges of translating curriculum reforms into lived educational realities.

The study further highlights the necessity of addressing systemic barriers such as inadequate training opportunities, insufficient instructional resources, and overcrowded classrooms that hinder the effective adoption of collaborative learning strategies. These findings contribute to the discourse by demonstrating that curriculum reforms cannot succeed through policy change alone; they must be supported by investments in teacher professional development, institutional capacity-building, and classroom-level resources.

Moreover, this research adds context-specific evidence to the international debate on CBC and 21st-century pedagogy. While global literature often identifies teacher competence as a determinant of curriculum success, few studies have examined how this plays out in the Kenyan primary school context. By documenting the experiences of Grade Three teachers, this study offers a localized perspective that enriches comparative education research and provides practical lessons for other developing countries undergoing similar curriculum transformations.

Finally, the study underscores the importance of reconceptualizing teachers not merely as implementers of curriculum policy but as active agents of change. Its contribution lies in framing teacher capacity-building as central to educational reform, while also illuminating the systemic and institutional conditions that must be addressed to unlock the full potential of the CBC.

3.2.3 Limitations

The study was limited to Grade Three teachers within a single sub-county, which may restrict the extent to which the findings can be generalized to other regions of Kenya or to different educational contexts. Variations in school infrastructure, teacher training opportunities, socioeconomic conditions, and administrative support across counties could potentially influence how the Competency-Based Curriculum (CBC) is implemented, meaning that the experiences documented in this study may not fully capture the diversity of practices nationwide.

Furthermore, the research relied primarily on self-reported questionnaires and classroom observations as the main methods of data collection. While these instruments provided valuable insights into teachers' awareness and practices, they are not without limitations. Self-reported data are inherently subject to social desirability bias, where respondents may overstate positive behaviors or underreport challenges in order to align with perceived expectations. Classroom observations, on the other hand, may be influenced by the Hawthorne effect, whereby teachers alter their instructional practices because they are aware of being observed. Both factors could have affected the authenticity of the data.

Another limitation concerns the cross-sectional design of the study, which captures teacher practices and perceptions at a single point in time. This approach does not allow for an examination of how teacher competence, resource availability, or institutional support might evolve over time. A longitudinal design would have provided a deeper understanding of the

dynamics of CBC implementation and the sustainability of collaborative learning practices.

Lastly, while the study focused on teacher perspectives and classroom practices, it did not incorporate the voices of learners, parents, or school administrators, all of whom play critical roles in shaping the effectiveness of curriculum implementation. Including these perspectives could have provided a more holistic view of the challenges and opportunities in embedding 21st-century skills within the CBC framework.

3.2.4 Suggestions

Future studies should aim to broaden the geographical scope of inquiry to include diverse counties and regions across Kenya, thereby capturing variations in socio-economic contexts, school environments, and institutional capacities that may shape the implementation of the Competency-Based Curriculum (CBC). Such broader sampling would enhance the representativeness of findings and provide more generalizable insights for national education reform. In addition, researchers are encouraged to employ longitudinal research designs that track teachers' practices, attitudes, and skill development over time. This would allow for an assessment of not only immediate outcomes but also the sustainability and long-term impact of professional development initiatives, resource provision, and policy interventions.

Another important recommendation is the need for intervention-based research that evaluates the effectiveness of specific teacher training models, mentoring programs, or technology-assisted instructional strategies in strengthening teacher competence. Experimental or quasi-experimental designs could provide robust evidence on which professional development practices yield the most significant improvements in the integration of 21st-century skills and collaborative learning within CBC classrooms. Additionally, future studies could adopt a multi-stakeholder approach, incorporating the perspectives of learners, parents, and school administrators to gain a more comprehensive understanding of the systemic factors that either enable or hinder curriculum implementation.

From a policy perspective, urgent attention should be directed toward addressing structural challenges that obstruct the realization of CBC objectives. Reducing classroom overcrowding is critical, as large pupil-teacher ratios severely limit the feasibility of interactive, learner-centered pedagogies. Equally important is ensuring the provision of adequate instructional resources, including textbooks, teaching aids, and technological tools, which are essential for facilitating collaborative and innovative learning experiences. Policymakers should also prioritize the creation and institutionalization of professional learning communities (PLCs) at the school and district levels. Such communities provide collaborative platforms where teachers can share best practices, engage in reflective dialogue, and collectively address challenges in CBC implementation.

Finally, there is a need for greater alignment between curriculum policy and classroom realities. Reforms must be accompanied by supportive mechanisms such as regular teacher mentoring, school-based capacity-building workshops, and decentralized funding models that empower schools to adapt resources to their unique contexts. These measures are critical not only to enhancing the effectiveness of 21st-century skills integration but also to ensuring that the implementation of the CBC framework is sustainable, equitable, and impactful in preparing learners for the demands of the contemporary world.

4. CONCLUSION

This study concludes that although Grade Three teachers in Thika Subcounty demonstrate relatively high levels of awareness regarding 21st-century skills and the pedagogical intentions of the Competency-Based Curriculum (CBC), the practical application of these competencies in classroom settings remains limited. The findings revealed a significant gap between conceptual understanding and classroom practice, largely attributed to systemic barriers such as inadequate professional development, insufficient instructional resources, overcrowded classrooms, and entrenched reliance on teacher-centered approaches.

The underutilization of collaborative learning strategies diminishes opportunities for learners to acquire critical skills such as co-reasoning, teamwork, communication, and problem-solving—skills that are essential for thriving in the 21st century. Without deliberate and sustained efforts to bridge this awareness-practice gap, the transformative aspirations of the CBC risk remaining unrealized.

The study therefore underscores the need for a holistic approach to CBC implementation that goes beyond teacher awareness. Professional capacity-building, resource provision, manageable class sizes, and supportive institutional structures are critical to ensuring that learner-centered pedagogies are not only adopted but sustained. Strengthening teacher competence and creating enabling environments will allow collaborative learning to become a cornerstone of classroom practice, thereby enhancing learners' acquisition of essential 21st-century skills.

Ultimately, the success of CBC in Kenya depends on aligning curriculum policy with classroom realities. Meaningful reform requires both systemic investment and grassroots innovation, with teachers positioned not just as implementers but as active agents of educational transformation.

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6. CONTRIBUTION STATEMENT

All authors made substantial and equal contributions to this study. Specifically, they jointly participated in the conceptualization and design of the research, development and validation of the research instruments, and coordination of the data collection process. Each author contributed to data analysis and interpretation, as well as to drafting and revising the manuscript to enhance its theoretical and practical implications. In addition, all authors were actively engaged in ensuring the ethical standards of the research, including obtaining necessary permissions and maintaining confidentiality of participants. The final version of the manuscript was reviewed and approved collectively by all authors, reflecting their shared responsibility for the accuracy, integrity, and scholarly quality of the work.

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