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Investigating the Influence of Training Resources and Materials in In-Service Teacher Training on the Implementation of the Competence-Based Curriculum in Public Primary Schools in Kilifi County, Kenya

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Competency-Based Curriculum, Teacher Training, Instructional Resources, ICT Integration, Curriculum implementation.

This study investigates the adequacy and effectiveness of training resources and materials in supporting in-service teacher training for implementing the Competency-Based Curriculum (CBC) in Kenya. The findings highlight significant gaps in resource provision, particularly in ICT tools and textbooks, emphasizing the need for enhanced support to ensure effective curriculum delivery and teacher preparedness. Findings revealed that over one-third (32.2%) of respondents reported that textbooks were adequate, while 40.7% indicated that ICT tools were adequate, which influenced teacher preparedness and curriculum delivery. Furthermore, it was noted that materials like teacher manuals and lesson plans were perceived as moderately effective (39.4%). On the other ICT resources and e-learning tools were reported as largely ineffective by 52.3% of respondents. Chi-square analysis highlighted statistically significant associations between the availability of key resources and instructional delivery, assessment, and professional growth. The study underscores the need for comprehensive teacher support, recommending enhanced provision of quality training materials, investment in ICT infrastructure, regular resource evaluation, and strengthened professional development programs. These measures are critical for the successful implementation of CBC and the realization of its objectives in Kenya's education sector.

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INTRODUCTION

The implementation of the Competency-Based Curriculum (CBC) in public primary schools hinges significantly on the quality and adequacy of training resources provided during in-service teacher training. Training materials, which serve as the backbone of professional development, empower educators with the knowledge and pedagogical skills required for effective CBC delivery. In Kilifi County, resource inadequacies have emerged as a critical barrier to teacher readiness. Malang (2021) revealed that inadequate materials during in-service training in Kenyan regions compromise teacher competency, limiting their ability to engage students in competency-based learning effectively. The CBC emphasizes active teacher-student interactions, innovative pedagogy, and authentic assessments. Without well-crafted, context-specific resources, these objectives remain unattainable, further entrenching challenges in curriculum implementation.

Addressing these challenges necessitates a strategic overhaul of training resources to align with CBC's principles and contextual demands. International experiences underscore the importance of comprehensive and accessible materials. In Finland, for instance, training materials include collaborative lesson plans and project-based learning guides, which significantly enhance teacher competence (Sahlberg, 2017). Similarly, Koskei and Chepchumba (2020) emphasize that training resources tailored to local needs can bridge the gap between theory and practice in CBC implementation. For Kilifi County, investing in regionally relevant materials, integrating digital platforms to overcome accessibility challenges, and

promoting teacher feedback in resource design could pave the way for more effective in-service training programs. By prioritizing resource adequacy and relevance, educational stakeholders can ensure that in-service teachers are well-equipped to foster a transformative learning environment under the CBC framework.

Successfully implementing the CBC depends on how well in-service teachers are professionally developed. Training resources, which refer to materials used during in-service sessions, are essential for fostering teachers' understanding of the content and pedagogies being taught (Anas & Musdariah, 2018). These resources play a pivotal role in shaping the learning experiences of educators and influence the adoption of the CBC in classrooms. In Kenya, the emphasis on teacher-student interaction as a key component of CBC underscores the necessity for aligned and adequate training materials. This paper explores the critical relationship between training resources and the effective professional development of in-service teachers for the seamless integration of the CBC.

Problem Statement

The implementation of the Competency-Based Curriculum (CBC) in Kenya represents a significant shift in educational practice, its success heavily depends on the preparedness and competence of in-service teachers. Existing research, including studies by Koskei and Chepchumba (2020) and Abdullahi (2019), highlights a critical challenge: the inadequacy of training resources for in-service teacher development. These studies point to a lack of sufficient and relevant training materials, such as tangible and digital resources, which undermines

the acquisition of practical teaching competencies and leads to a predominantly theoretical approach to CBC training. However, despite this recognition, there remains a notable research gap in understanding how the availability, quality, and contextual relevance of these training resources specifically influence teachers' ability to implement the CBC effectively. Little empirical work has been done to explore the direct relationship between resource adequacy and teacher competency development within the CBC framework. This gap underscores the need for further investigation into the role of training resources in shaping teacher effectiveness and, ultimately, the success of CBC in Kenyan classrooms.

Objectives

- To examine the availability and adequacy of training resources for in-service teacher training in Kenya.
- To assess the impact of training resources on the competencies of in-service teachers.
- To explore strategies for enhancing the alignment of training resources with CBC goals.
- To evaluate international best practices in teacher training resources and their applicability to the Kenyan context.

Hypotheses

- Adequate training resources positively impact the competencies of in-service teachers.
- Inadequate training resources significantly hinder the implementation of the CBC.
- Context-specific and well-aligned training materials improve teacher-student interactions and curriculum delivery.

LITERATURE REVIEW

The successful implementation of the Competency-Based Curriculum (CBC) in Kenya requires well-

trained teachers equipped with the necessary resources to deliver its objectives (TSC, 2020; KICD, 2017). In-service teacher training plays a pivotal role in building teacher competencies for curriculum implementation (Njagi, 2020). Training resources and materials, including instructional guides, lesson plans, and assessment tools, are fundamental to enhancing educators' understanding of CBC principles and pedagogies (Koros & Achieng, 2023). However, resource inadequacies have been identified as a significant challenge, particularly in regions such as Kilifi County, where the availability and quality of training materials directly impact teachers' preparedness (Mrina, Njoroge, & Chui, 2024). This study investigates the influence of training resources and materials on in-service teacher training and how these resources affect the successful implementation of the CBC in public primary schools in Kilifi County.

In-service teacher training is an essential component of education reforms aimed at equipping educators with the skills required for effective curriculum implementation (TSC, 2020). The Competency-Based Curriculum (CBC) in Kenya emphasizes learner-centered approaches, active teacher-student interaction, and competency-based assessments, all of which demand well-crafted and accessible training resources (KICD, 2017). Training materials serve as the foundation for equipping teachers with the pedagogical skills necessary to translate curriculum goals into practice (Koros & Achieng, 2023). However, the adequacy and alignment of these resources with CBC objectives have been areas of concern, particularly in Kilifi County, where resource limitations are reported to directly impact teacher preparedness (Mrina, Njoroge, & Chui, 2024). This study explores the critical role of training resources and materials in shaping in-service teacher competencies and their subsequent influence on CBC implementation in public primary schools.

Training resources play a pivotal role in teacher professional development worldwide. According to

Darling-Hammond (2017), high-quality training materials that include practical examples, lesson plans, and assessment strategies are essential for implementing competency-based instruction. Finland's education system, which emphasizes collaborative learning and continuous assessment, is supported by comprehensive teacher training resources (Sahlberg, 2017). Similarly, Ontario, Canada, developed extensive materials to guide in-service teachers, ensuring consistent curriculum delivery (Ontario College of Teachers, 2006).

In Africa, the implementation of competency-based education often faces challenges related to resource inadequacies. Studies in Nigeria and South Africa reveal that insufficient training materials limit teachers' abilities to transition from traditional to competency-based pedagogies (Adeyemi, 2018). The need for context-specific resources that address unique regional and cultural needs has been emphasized in educational reforms across the continent (Chen, 2013).

In Kenya, the transition to CBC has highlighted significant gaps in training resources. Malang (2021) found that resource inadequacies during in-service training in Malanga sub-county hindered teacher competencies. Koskei and Chepchumba (2020) reported similar findings in Nakuru County, where derisory training resources led to theoretical training approaches. The need for aligned and accessible resources is critical to ensure effective curriculum delivery.

Theoretical Review

This study is anchored in Fullan's Theory of Educational Change, which emphasizes the importance of resources in facilitating successful curriculum reforms. According to Alfiras (2024), high-quality training materials and sustained support are critical for enabling teachers to adopt new pedagogical approaches. The theory highlights the interconnectedness of training resources, teacher competencies, and curriculum outcomes.

METHODOLOGY

Research Design

The study employed a mixed-methods approach, combining quantitative and qualitative data to assess the role of training resources in CBC implementation.

Target Population

The study's target population included 213 schools and different stakeholders involved in the CBC programme in the county, including 7 sub-county education officers, 14 curriculum support officers, 208 trainer of trainers, 213 head teachers, and 1648 teachers in Malindi, Magarini, Kilifi North, Kilifi South, Kaloleni, Rabai, and Ganze in sub-counties

Sampling Techniques

The sample size for the study included public primary schools selected from the total population of public primary schools in Kilifi County. The study triangulated several sampling techniques to select elements from the target population. Each of the sub-counties constitutes a stratum from which a distinct number of public primary schools were selected after calculations based on Gachiku's (2021) proposition that 10-30% of a population is enough to make a statistical generalization. 63 schools were selected by simple random sampling from the study area.

The 63 public primary schools were spread equally across the 7 sub-counties in the study, with 7 schools representing each sub-county. Several respondents were then selected from the 7 strata as participants in the data collection phase. These included one sub-county education officer and curriculum support officer from each sub-county, 9 head teachers from each selected public primary school, 42 teachers from each of the sub-counties, and 8 trainers of trainers (TOTs) from each sub-county to give their insights on the study topic

Data Collection Methods

The study triangulated both quantitative and qualitative techniques in data collection. Surveys were administered to teachers to collect data on the availability and adequacy of training resources. Additionally, focus group discussions and interviews provide insights into teachers' experiences and perceptions of training materials. An interview guide was developed to gather data from the trainers of trainers, curriculum support offices, and sub-county education officers in detail because they allow for two-way conversation and discussion on a focused topic. The semi-structured nature of the instrument guided the researcher on the core concepts to ask about and at the same time gave freedom to move the conversation in a direction of interest whenever an opportunity presented itself. Additionally, focus group discussions were constructed in line with the study objectives using existing literature, the theoretical and conceptual basis of the study.

Data Analysis

Quantitative data was analyzed using descriptive and inferential statistics to identify trends and correlations. First, all the data (open-ended questionnaire and interview documents) was reviewed in a general manner to obtain a sense of the data and emerging themes. The data collected was then be tabulated, scrutinized, and collated for analysis. The Statistical Package for Social Science (SPSS) version 21 was used for coding, processing, and tabulation. Descriptive statistics on socio-demographic characteristics were presented to characterize the study participants. Depending on the type of variable, appropriate summary statistics for the measurement scale will be used to describe the distribution of the variables. These were included proportions for categorical variables such

as gender, age, and experience. These summary statistics were presented in tables, frequencies, and percentages. Analysis was conducted to provide structure to the gathered data and allow for triangulation between the various research instruments used.

A Pearson's Chi-square test analysis was used to analyse quantitative data collected from the questionnaire to give the results a holistic relationship between the variables. The qualitative and quantitative data were then integrated to facilitate the discussion of the main results and analysis of the data by the researcher to interpret, summarize, and draw conclusions and recommendations for the study.

STUDY FINDINGS

The researcher sought to determine the influence of training resources and materials and the in-service training of teachers. Training Resources and Materials in the context of in-service training for teachers implementing the Competency-Based Curriculum (CBC), refers to the provision and utilization of various resources and materials to support educators in their professional development. This aspect of training encompasses the tangible tools, curriculum guides, instructional materials, and technology that aid teachers in understanding and implementing CBC effectively. The study findings are presented below.

Adequacy of Training Materials

The researcher sought to determine the availability and adequacy of training materials during CBC in-service training. The study findings are presented in Table 1 below.

Table 1: Adequacy of training materials

	Adequate	Inadequate
Teacher manuals on CBC	40	60
Textbooks	32.2	67.8
Lesson plans schemes of work	45.6	54.4
ICT resources	40.7	59.3
Basic training manual for beginners related to the use of different computer hardware such as laptops, desktops, whiteboards, graphic tablets	56.3	33.7
Other training materials	40.9	59.1
Microsoft office suite application training manuals in Microsoft excel or spread sheet, outlook, word processing	47.7	52.3

Findings in Table 1 reveals that certain resources, such as teacher manuals on CBC (40% adequate), basic training manuals for beginners in computer hardware usage (56.3% adequate), and Microsoft Office Suite application training manuals (47.7% adequate), the majority of respondents perceive inadequacies in the provision of these resources. Specifically, textbooks (32.2% adequate), ICT resources (40.7% adequate), lesson plans schemes of work (45.6% adequate), and other training materials (40.9% adequate) are reported as insufficient. This suggests a potential gap between the resources available to support CBC implementation and the requirements for adequately preparing educators. Inadequacies in these resources may hinder educators' preparedness to effectively implement the CBC, impacting the quality of instruction and ultimately the success of the curriculum in achieving its goals. The implications of the perceived inadequacies in resources for implementing the Competency-Based Curriculum (CBC) in Kenya are significant. Firstly, without sufficient teacher manuals, textbooks, lesson plans schemes of work, and other training materials, educators may struggle to effectively understand and implement the curriculum's objectives and methodologies. This could lead to inconsistencies in teaching practices and hinder the delivery of quality education aligned with CBC principles. Moreover, the reported inadequacies in ICT resources and basic training manuals for computer hardware suggest potential challenges in integrating technology into instruction, which is

essential for preparing students for the digital age. Insufficient resources may also impact educators' confidence and ability to adapt to the CBC's learner-centered and competency-focused approach. Ultimately, addressing these resource deficiencies is crucial to ensuring that educators are adequately prepared to implement the CBC and provide students with the skills and knowledge needed to thrive in the modern world.

The findings highlight challenges and opportunities in the availability and adequacy of resources for the implementation of the Competency-Based Curriculum (CBC). While a substantial portion of teachers (40%) reported the presence of teacher manuals, the dissatisfaction expressed by 37.9% regarding their adequacy suggests a need for improvements in the comprehensiveness and effectiveness of these resources. A similar pattern emerges with textbooks, where 67.8% of teachers noted their availability but only 18.2% found them sufficient for CBC implementation. This indicates a potential gap in the alignment of available textbooks with the requirements of the CBC curriculum, necessitating a review and enhancement of available materials.

Furthermore, the positive feedback on the availability and articulation of lesson plans and schemes of work (67.8%) reflects a promising aspect, suggesting that these resources are well-prepared and aligned with the CBC requirements. However, the reported inadequacy by 21.6% implies the need for ongoing refinement and

enhancement to ensure that these crucial instructional tools fully support teachers in implementing CBC effectively. The findings related to ICT resources present a mixed picture, with 37.5% reporting their availability, but 32.9% indicating their absence in schools. The limited availability of ICT resources, coupled with only 11% deeming them sufficient, underscores the necessity for increased access and adequacy of technology-related materials to support CBC implementation. Additionally, the reported absence of basic training manuals for computer hardware and inadequacy in Microsoft Office Suite

application training materials (40.9% and 40.5%, respectively) suggests a need for comprehensive professional development resources to ensure that teachers are proficient in utilizing technology for CBC delivery.

Effectiveness of The Training Materials Needed in Implementing the CBC Program

The study also sought to find out from the teachers the effectiveness of the training materials needed in implementing the CBC program. The findings were presented in Table 2 below.

Table 2: Rate of the effectiveness of the training materials

	Very ineffective	moderately ineffective	Neutral	moderately effective	Very effective
Teacher Manuals	11.4	18.6	11.4	47.3	11.4
Textbooks	0	11.4	6.8	36.4	45.5
Lesson plans schemes of work	0	3.8	11.4	39.4	45.5
ICT resources	3.8	48.5	3.4	33	11.4
e-learning training materials	3.8	48.5	0	32.6	15.2

Study findings in Table 2 show that over half (58.7%) of the trainees reported that teachers' manuals were effective in training for the implementation of CBC program, while 30% reported that teachers' manuals were not effective in training for the implementation of CBC program with 11.4% being very ineffective. Over four-fifths (81.9%) of the trainees reported that textbooks were effective material needed for the implementation of CBC while 11.4% reported that textbooks were moderately ineffective for training CBC. Furthermore, 84.9% of the teachers added that lesson plans and schemes of work were effective materials for the implementation of CBC, while 3.8% of the trainees said that they were moderately ineffective. Contrary, over half (52.3%) of the teachers reported that ICT resources were ineffective materials for training on the implementation of CBC while 44.4% reported that ICT resources were effective for training on the implementation CBC program. Finally, 52.3% of the teachers reported that e-learning training

materials were ineffective in the implementation of CBC while 47.8% of the teachers said that e-learning materials were effective in training for the implementation of CBC.

The implications of the study findings in Table 4.8 reveal a nuanced perspective on the effectiveness of various teaching materials in the training for the implementation of the Competency-Based Curriculum (CBC). Notably, a majority of trainees found teacher manuals to be effective (58.7%), emphasizing their utility in guiding educators through the CBC program. However, the existence of a considerable proportion (30%) who reported them as not effective, with 11.4% deeming them very ineffective, underscores the need for potential improvements in the design or delivery of these manuals to ensure they meet the diverse needs of teachers.

The positive response to textbooks, with 81.9% considering them effective, suggests their perceived value in supporting CBC implementation.

Similarly, a high percentage of trainees (84.9%) found lesson plans and schemes of work to be effective materials, highlighting their importance in providing structured guidance for teachers. Conversely, a significant portion of teachers expressed concerns about the effectiveness of ICT resources (52.3%) and e-learning training materials (52.3%). The split views on these technologies suggest the need for a more strategic approach to incorporating digital resources in CBC training, considering the diverse technological readiness and preferences among teachers.

This study results negates those of Malang (2021) inadequacy in resources provided during the in-service training does not limit the competency of teachers. Further they agree with Probowo (2020)

that materials and resources in in-service teacher training is crucial and has implication for the implementation of the CBC in primary schools. Koskei and Chepchumba (2020) and Abdullahi, (2019) revealed derisory training resources and materials as key pediments to the CBC implementation due to the theoretical nature of the training. Thus the provision of materials, tools, and other resources during the training are priemaly part of implementation process in CBC.

Testing the level of adequacy of training resources and materials in in-service teacher training on the implementation of the competence-based curriculum in public primary schools

Table 3: Testing the level of adequacy of training resources and materials in in-service teacher training on the implementation of the competence-based curriculum in public primary schools

	Teachers' preparation and planning			Instructional and delivery			Assessment, supervision and feedback			Professional engagement, growth and development		
	χ^2	DF	P	χ^2	DF	P	χ^2	DF	P	χ^2	DF	P
Teacher Manuals	0.360	4	0.986	15.759	4	0.003	25.768	4	0.000	4.382	4	0.357
Textbooks	0.316	3	0.957	4.428	3	0.219	11.585	3	0.009	1.128	3	0.770
Lesson plans schemes of work	0.127	3	0.988	8.528	3	0.036	17.085	3	0.001	4.926	3	0.177
ICT resources	0.803	4	0.938	28.320	4	0.000	19.730	4	0.001	8.005	4	0.091
e-learning training materials	1.057	3	0.878	19.940	3	0.00	13.681	3	0.003	9.204	3	0.027

Finding in Tables 3 provides insights into the significant associations in various aspects of teacher training for implementing the CBC program, specifically focusing on teachers' preparation and planning, instructional delivery, assessment, supervision, and feedback, as well as professional engagement, growth, and development. Results shows teachers' preparation and planning, there is no statistically significant association observed for

teacher manuals, textbooks, lesson plans, and schemes of work. However, instructional delivery exhibits a highly significant association ($p = 0.003$) with teacher manuals, indicating that teachers' perspectives on instructional delivery significantly vary based on the availability and effectiveness of teacher manuals. Additionally, assessment, supervision, and feedback show a highly significant association ($p = 0.000$) with teacher manuals,

suggesting that the presence and quality of teacher manuals significantly influence teachers' perceptions in these areas. Professional engagement, growth, and development do not exhibit a statistically significant association with teacher manuals.

Further Table 3 shows that instructional delivery significantly impacts teachers' perspectives on textbooks ($p = 0.219$), suggesting that the availability and quality of textbooks influence teachers' views on instructional delivery. Assessment, supervision, and feedback show a significant association ($p = 0.009$) with lesson plans and schemes of work, indicating that teachers' perceptions in these areas vary based on the quality and utilization of lesson plans. The presence and availability of ICT resources are significantly associated with instructional delivery ($p = 0.000$) and professional engagement, growth, and development ($p = 0.091$), suggesting that the integration of ICT resources in training influences teachers' perceptions in these domains. Furthermore, e-learning training materials significantly impact assessment, supervision, and feedback ($p = 0.003$) and professional engagement, growth, and development ($p = 0.027$), indicating that the effectiveness of e-learning materials influences teachers' perspectives in these areas.

Consequently, the chi-square test underscores the significance of teacher manuals in shaping teachers' perceptions of instructional delivery and assessment, supervision, and feedback. Additionally, the availability and quality of textbooks, lesson plans, schemes of work, ICT resources, and e-learning training materials significantly influence teachers' perspectives in various domains. These findings emphasize the importance of providing comprehensive and effective teaching materials, especially teacher manuals and ICT resources, to enhance teacher preparedness and satisfaction in implementing the CBC program, particularly in instructional delivery and assessment-related activities.

CONCLUSION

The findings highlight the critical role of training resources and materials in shaping the effectiveness of in-service teacher training for the Competency-Based Curriculum (CBC) in Kenya. While some resources, such as teacher manuals and basic training materials for computer hardware, were found to be moderately adequate, significant gaps were identified in the provision of essential resources like textbooks, ICT materials, and e-learning tools. These inadequacies hinder educators' ability to effectively plan, deliver, and assess instruction aligned with CBC principles. The study underscores the importance of comprehensive and accessible materials to support teachers in their professional development, particularly in leveraging technology and structured instructional guides. Furthermore, the chi-square analysis reveals statistically significant associations between specific resources (e.g., teacher manuals, ICT resources, and e-learning materials) and critical domains of CBC implementation, including instructional delivery, assessment, and professional growth. Addressing these resource gaps is essential for enhancing teacher preparedness, promoting consistent curriculum implementation, and achieving the desired educational outcomes of the CBC program.

Recommendation

From the findings, the following four recommendations can be deduced:

- The government and educational stakeholders should prioritize the development and distribution of adequate and high-quality training materials, such as teacher manuals, textbooks, and lesson plans. These materials must be aligned with the objectives of the Competency-Based Curriculum (CBC) to ensure educators are well-prepared to deliver effective instruction.
- Given the reported inadequacies in ICT resources and e-learning training materials,

there is a need for increased investment in technology infrastructure in schools. Additionally, comprehensive ICT training programs should be implemented to ensure teachers are equipped to integrate technology effectively into the CBC implementation.

- Continuous evaluation of the effectiveness and adequacy of training materials is essential. Feedback from teachers should be used to revise and improve these resources to ensure they meet the practical needs of educators in implementing the CBC.
- Professional development initiatives should include targeted training on using ICT tools, e-learning materials, and other instructional resources. These programs should also address gaps in teachers' confidence and competence in delivering CBC content, ensuring holistic preparation for their roles.

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