IMPACT OF SELECTED RESOURCE MANAGEMENT CHALLENGES ON IMPLEMENTATION OF COMPETENCY-BASED EDUCATION IN PUBLIC JUNIOR SCHOOLS IN BARINGO COUNTY, KENYA

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A Thesis Submitted to the Institute of Postgraduate Studies of Kabarak University in Partial Fulfilment of the Requirements for the Award of the Doctor of Philosophy in Education (Leadership And Management)

KABARAK UNIVERSITY

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This work could not have come to its present form without the support and assistance of my supervisors. I sincerely appreciate their efforts. However, any mistake in the document remains my own.

DEDICATION

I wish to dedicate this work to my beloved husband, children, and fellow staff members for their patience and support during times of great apprehension and work.

ABSTRACT

This study examined how selected resource management challenges influence the implementation of Competency-Based Education (CBE) in public junior schools in Baringo County, Kenya. Despite national efforts to strengthen CBE, implementation in marginalized regions such as Baringo continues to face persistent weaknesses in the provision of human, physical, ICT, and financial resources, creating disparities in curriculum delivery and learner outcomes. The study was guided by Kotter's Change Management Theory, which underscores the importance of strategic leadership, stakeholder engagement, and resource alignment in driving successful educational reforms. The purpose of the study was to determine the extent to which human, physical, ICT, and financial resource management challenges affect the effective implementation of CBE. In line with this purpose, the study investigated how teacher capacity, infrastructural adequacy, digital readiness, and financial governance relate to CBE enactment in junior schools. A descriptive research design was adopted, and the study was conducted across six sub-counties in Baringo County. The target population comprised 1,739 stakeholders, including head teachers, junior school teachers, and sub-county directors. Using stratified random sampling, a sample of 317 respondents was selected. Data were collected through questionnaires and interview guides. Instrument validity was ensured through expert review, while reliability was confirmed through pilot testing in eight junior schools excluded from the main study. Quantitative data were analysed using descriptive statistics and regression analysis, while qualitative data were subjected to thematic analysis. Findings revealed that, among the four resource management dimensions, only financial resource constraints had a statistically significant effect on CBE implementation ($B = –0.488$, $p = 0.021$). Human resource challenges—such as insufficient teacher training, inadequate continuous professional development, resistance to pedagogical change, and heavy workloads were widespread but not statistically significant. Physical resource limitations, including overcrowded classrooms, inadequate laboratories, and shortages of instructional materials, similarly hindered teaching but did not significantly predict implementation outcomes. ICT-related challenges, such as insufficient devices, limited connectivity, and low digital competence among teachers, also emerged but were not statistically significant in the regression model. The study concludes that although human, physical, and ICT challenges remain substantial, financial resource constraints form the most critical barrier to CBE implementation in Baringo County. Effective curriculum delivery, therefore, depends on strengthened financial planning and timely resource allocation. The study recommends enhanced funding structures, targeted investment in teacher training, expansion of physical and ICT infrastructure, and improved financial governance mechanisms to support the sustainable implementation of CBE in junior schools.

Keywords: *Teacher Training, Infrastructure, Educational Policy, Descriptive Research, Regression Analysis, Educational Challenges*.

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LIST OF ABBREVIATIONS AND ACRONYMS

CBE	Competency-Based Curriculum
CBE	Competency-Based Education
ICT	Information Communication Technology
MUHAS	Muhimbili University of Health and Allied Sciences
SPSS	Statistics Package for the Social Sciences

CONCEPTUAL AND OPERATIONAL DEFINITION OF TERMS

Competency-Based Education: Refers to an educational approach where learners progress upon demonstrating mastery of specific skills, knowledge, and attitudes rather than time spent in class, emphasizing learner-centered instruction and personalized learning (AACN, 2023).

Resource Management: Refers to the systematic planning, allocation, and utilization of human, physical, financial, and technological resources to achieve educational goals efficiently (Teachers Institute, 2023).

Financial Constraints: Refers to limitations in available funding that affect schools' ability to acquire resources, implement programs, and maintain high-quality educational delivery (Amacad, 2023).

Human Resources: Refer to the management, development, and utilization of school personnel, including teachers and administrative staff, to enhance instructional quality and learning outcomes (Edustaff, 2023)

Physical Resources: Refer to the tangible assets in schools, such as classrooms, laboratories, libraries, and teaching aids, which are necessary for effective curriculum implementation (Teachers Institute, 2023).

ICT Resources: Refer to digital tools, software, and infrastructure, including computers, internet access, and multimedia devices, used to support teaching and learning processes (21k School, 2023).

Public Junior Schools: Refer to government-funded institutions that provide primary education to children, typically aged 8–13 years, and are responsible for delivering the national curriculum (Ministry of Education, Kenya, 2022).

Curriculum Implementation: The process of translating curriculum plans into classroom practice through teaching methods, resource utilization, and assessment of learning outcomes (Fiveable, 2023).

CHAPTER ONE

INTRODUCTION

1.1 Background Information

Education plays a constructive role in shaping learners' intellect, character, and physical abilities. According to the United Nations Educational, Scientific, and Cultural Organization (2024), education is the process through which societies deliberately transmit knowledge, skills, and values from one generation to the next. In contemporary education systems worldwide, formal schooling involves structured academic activities that span a learner's developmental stages to nurture well-rounded, holistic individuals who can contribute responsibly to society (UNESCO, 2024). To fulfill this critical purpose, countries around the world continually change their education systems and undertake learner-centered curricula reforms to suit learners' needs, interests, and preferences, and to tap into their talents and competencies at any given moment. This has led many countries around the world to adopt Competency-Based Education as a panacea for educational challenges.

Competence-Based Education (CBE) has gained significant traction in the education sector, emphasizing practical, skills-oriented learning that prepares learners for real-world application. In Kenya, the Competence-Based Curriculum (CBE) was introduced to replace the 8-4-4 education system, which was criticized mainly for its theoretical approach to learning (Omondi & Achieng, 2020). However, the effective implementation of CBE faces several challenges, including teacher competency, availability of resources, quality of supervision and leadership, and the appropriateness of the adopted assessment methods (Sifuna & Obonyo, 2019; Ng'andu, 2022; Nyaboke et al., 2021). Therefore, a comprehensive understanding of these factors is essential to facilitate the successful adoption and sustainability of the CBE within the Kenyan education system.

According to Bondi and Wiles (2023), a Competency-Based Education (CBE) is a form of curriculum that focuses on the complex outcomes of the learning process, specifically, the knowledge, skills, and attitudes that learners are expected to apply, rather than merely emphasizing traditional subject content. The authors further explain that a CBE is typically structured around a set of core learner competencies, which may be cross-curricular or subject-specific. Edinger (2022) adds that, due to the widespread problem of curriculum overload in many educational institutions worldwide, policymakers have advocated developing competency-based objectives to enhance the structure and relevance of education. In this regard, Edinger (2022) contends that proficiency should be the key focus, emphasizing what primary school learners can practically do based on what they have learned over time.

The global adoption of Competency-Based Education (CBE) has taken root due to the realization that education systems that do not foster competencies alongside conventional teaching methods that emphasize memorization and exams often do not prepare learners for the competitive world economy. The European Qualifications Framework defines competency in terms of the ability to apply knowledge and skills effectively in the working environment (Kellie, 2019).

Therefore, competence is an individual's ability to perform a particular task with skills, character, and past experience. In recent years, many countries, including those in Europe, North America, and Asia, have shifted towards competency-based approaches in education and training to enhance the applicability of skills, thinking, and problem-solving among learners (Gulled, 2023). This shift in education, however, comes with some challenges, especially when trying to implement it in environments with scarce resources and a lack of management skills.

In Latin America, Hanushek and Luque (2023) report that only 23.9% of schools have successfully implemented Competency-Based Education, with only 20.8% of learners demonstrating improvement in foundational numeracy, language, science, life, and creativity skills. The researchers attribute the limited implementation of CBE to various factors, among them ineffective school management practices. This observation aligns with the findings of Sturgis and Casey (2023), who emphasize that transitioning from traditional curricula to Competency-Based Education in primary schools requires strong, strategic management practices. School leadership plays a critical role in overseeing implementation, ensuring adherence to curriculum guidelines, and conducting systematic evaluations to achieve the intended educational outcomes.

Research articles on competency-based education (CBE) models in the United States and South Korea reveal a number of issues, for instance, limited professional development for teachers, limited resources, and variations in implementation. To address these concerns, the study proposed enhanced instructor training and greater programme coherence across grade levels to improve implementation (Muchira et al., 2023). Across the world, the use of CBE systems has altered the role that teachers play in classrooms. A teacher, for instance, from Indonesia, is no longer the dispenser of knowledge but rather a trainer who helps students determine learning outcomes and promote reflexivity as well as lifelong learning (Manduku & Sang, 2021). Yet there were issues because many of the teachers, and even policy-makers themselves, were not prepared to grasp and promote CBE sufficiently. This deficiency also holds true for some European countries.

In Finland, where the implementation of CBE has been notably successful, Bennett, Swanson, Schaefer, and Falbe (2024) observe that considerable effort has been made to operationalize the officially prescribed curricula, syllabi, and subjects. They emphasize that Competency-Based Education is implemented as learners acquire the intended

experiences, knowledge, skills, ideas, and attitudes necessary for effective participation in society. In essence, researchers agree that implementing CBE involves translating the officially designed curriculum into practical teaching tools such as syllabi, schemes of work, and classroom lessons. Nevertheless, the process of implementing CBE has encountered several challenges along the way. This reflects the scenario in other countries such as Australia and Germany, where, during the transition to CBE, there was a sharp focus on the proper training of educators and school principals. Essentials for implementing CBE include leadership and communication (Hellwig, 2006; Uljens et al., 2017; Misko, 1999). Cohesive interpersonal communication by school leaders fosters an environment that supports teachers in successfully delivering the curriculum (Klein & Schwanenberg, 2020).

In the African context, the CBE implementation is regarded as a long-awaited reform that will help the Continent meet its educational and socioeconomic demands. Rwanda and Cameroon, among several other African countries, have adopted CBE to develop a more responsive, skills-based education framework. However, African countries seem to face constraints such as leadership approaches, large student-teacher ratios, insufficient teacher training, inadequate infrastructure, resource management problems, and insufficient funds to support this system, which create implementation problems (Cheptoo & Ramadas, 2019). These challenges are magnified in the countryside and other scarcely populated areas to the extent that distribution of resources and quality education is concerned (Rude & Miller, 2018). For example, in the Rwandan context, perceived challenges have included large class sizes, poor resource endowments, and low parental participation, as highlighted by Urunana (2018).

In other African countries, studies also reveal the same issues. When the CBE was implemented in Zambia, it faced challenges due to inadequate teacher training, as

observed by Mulenga and Kabombwe (2019). According to Likisa (2018), the Ethiopian CBE did not align very clearly with occupational standards. Also missing were insights from teachers, Center of Competence specialists, and alumni on what Competency-Based Education (CBE) is, what it is not, its scope, its evaluation, and the design of its curriculum.

In Uganda, Wambiya and Ogula (2023) and Kidega et al. (2024) found that although CBE is appropriate for schools, it has never been well implemented due to limited teacher training, inadequate infrastructure, classroom overcrowding, and a lack of necessary items. Problems also included the teachers' negative attitude towards CBE and the need for judgment to be based on field research into the implementation of the curriculum. Some recommendations the study forwarded were: adequate funding, full implementation of teachers' training, and improved infrastructure.

The implementation of CBE in Kenya, which commenced in 2017, has transitioned Kenya from a content-dense syllabus under the 8-4-4 system to a learner-centered, skills-based system. As per the CBE, the Ministry of Education expects learners to be prepared with crucial attitudes such as communication, collaboration, innovation, and critical thinking in a dynamic world (KICD, 2019). Still, in this regard, the implementation of CBE has been accompanied by specific management difficulties, especially in the context of public school activities. Such challenges are attributed to low teacher training, limited teaching resources, a lack of information and communication technologies, and inadequate funding.

A study conducted in Meru County by Kinoti and Njeru (2020) revealed that greater preparedness among education stakeholders is essential for the successful implementation of the Competency-Based Education. The researchers emphasized the need for extensive consultations, comprehensive teacher and headteacher training, and

adequate resource allocation to schools to minimize stress and reduce the likelihood of implementation failures. Despite these efforts, the CBE rollout continues to face significant challenges. Similarly, an assessment carried out in Nairobi County by Karimi (2020) found that the implementation of CBE has encountered several shortcomings, with many learners in public primary schools exhibiting low competency levels in basic numeracy, creativity, and vital life skills such as problem-solving and leadership.

A study conducted in Machakos County, as noted by Wambua and Waweru (2019), found that teachers were not well prepared for CBE implementation, and the available resources to support it were lacking. Moreover, teachers showed resistance to shifting from a content-based to a competency-based approach, thereby making the curriculum shift more difficult (Wambua & Waweru, 2019). Although the challenges stated are not peculiar to Kenya, the absence of an intensive professional development programme to train teachers and school administrators has hampered the successful implementation of CBE. Research conducted in Kakamega County revealed that parents, who are supposed to work hand in hand with teachers to facilitate learning, have been reluctant to contribute to the provision of learning materials, which has put more pressure on head teachers and teachers during CBE implementation (Amunga et al., 2020). In addition, a lack of teacher training has led to poorly defined knowledge and poor implementation of CBE in Bomet East sub-county (Momanyi & Rop, 2019). Another study conducted in Kisumu Central Sub-County found that classroom overcrowding and teachers' low competency levels negatively affected the implementation of the learner-centered approach (Odero et al., 2021).

Kenya’s education system has undergone continuous transformation since independence, with reforms aimed at enhancing both accessibility and quality of learning. The latest reform focuses on adopting the Competence-Based Curriculum (CBE), structured under

the 2-6-3-3-3 system. Compared to the previous 8-4-4 framework, the CBE is viewed as more intricate and resource-intensive, demanding greater investment in infrastructure, learning materials, and teacher preparation (Milligan, 2017; Mbugua et al., 2021). A primary concern surrounding this transition is schools' readiness to effectively implement the new curriculum, particularly regarding the adequacy of resources and the development of new teacher competencies required to support competence-based learning (Munyasia & Olel, 2020).

The implementation of Competency-Based Education (CBE) is even more challenging in rural regions such as Baringo County in Kenya. Geographic isolation and socio-economic underdevelopment, together with acute shortages of qualified teachers, inadequate physical infrastructure, limited access to Information and Communication technology, and chronic financial constraints, characterize this area (Cheruiyot, 2024). These pervasive challenges are well documented in national documents such as the Basic Education Curriculum Framework (KICD, 2017) and the CBE Implementation Status Report (Kenya Yearbook Editorial Board, 2022), as well as in the media (Koech, 2021).

Consequently, this study sought to examine the effects of these management challenges on CBE implementation in Baringo County junior schools and to propose evidence-based strategies to improve educational outcomes in these settings. From a rigorous synthesis of scholarly research and national data, we see the focus of this study: human resource capacity, physical infrastructure, ICT integration, and financial constraints. Studies by Komba and Mwandaji (2015) and Momanyi and Rop (2019) show that teacher preparedness and infrastructural adequacy are prerequisites to the proper running of curriculum reforms. National reports from KICD (2017) and the Kenya Yearbook Editorial Board (2022) also confirm these findings, which clearly indicate that resource limitations are a significant barrier to CBE success in rural schools.

Kenya has embraced Competence-Based Learning as part of its education reform agenda (Ngwacho, 2019). The Competence-Based Curriculum (CBE) follows the 2-6-3-3-3 structure, which comprises two years of pre-primary education, Pre-Primary 1 (PP1) and Pre-Primary 2 (PP2), followed by six years of primary education divided into lower primary (Grades 1–3) and upper primary (Grades 4–6). This is succeeded by three years of lower secondary education, three years of senior secondary education, and finally, three years at the university level (Akala, 2021).

The skills and competencies needed in the job market are changing and require the adoption of an education system that can meet the skills demand. The aspect has led to the evolution of the education system by the government to identify an ideal education style that can churn out students ready for the job market. Consequently, this led to the adoption of a competence-based education system that is perceived to facilitate exposure of learners to practical and near-real-life situations that make them ready for the market (Mbugua et al., 2021).

Despite progress, the implementation of the Competence-Based Curriculum (CBE) in Kenya continues to face numerous challenges and barriers that hinder its achievement of the intended objectives. Several factors have been identified as influencing the successful implementation of education reforms, including organizational infrastructure and attitudes (Al-Adwan & Smedley, 2012), the decision-making processes of those managing educational change (Rinne et al., 2016), teacher-related aspects such as competency and availability (Sitienei, 2020), teaching and assessment approaches (Nyaboke et al., 2021), and the adequacy of learning resources and technological support (Sifuna & Obonyo, 2019). It is therefore essential to examine institution-specific factors that affect CBE implementation to inform effective improvement strategies. In Kenya, primary education serves as the foundational stage where learners are first introduced to

formal learning. Traditionally, this level spanned eight years, accommodating learners aged between six and thirteen years.

Primary schools in Kenya are categorized into public and private institutions. Public schools are primarily managed and funded by the government and offer free basic education to all learners in line with the country's commitment to universal education access. In contrast, private primary schools are established and operated by individual or corporate investors as business ventures. However, they remain under government oversight, particularly regarding curriculum implementation and the administration of national examinations (Njiri et al., 2021). According to the Ministry of Education, Kenya has approximately 31,200 primary schools nationwide (education.go.ke, 2022).

Primary schools in Kenya currently operate under two parallel education systems: the Competence-Based Curriculum (CBE), which is being progressively implemented for new learners, and the 8-4-4 system, which is gradually being phased out. The government maintains close oversight of the education sector, including the management of resources, teacher training and deployment, and the moderation of national examinations in primary schools (education.go.ke, 2022). The shift from an examination-oriented to a performance-oriented system marks a significant transformation in Kenya's education landscape, introducing new challenges for school administrators, teachers, parents, and policymakers (Mackatiani, 2017). Nonetheless, the implementation of CBE in primary schools has been found to vary across different regions.

In 2016, the Kenya Institute of Curriculum Development (KICD) approved the adoption of the Competence-Based Curriculum (CBE), an inclusive approach designed to cater to the diverse learning needs of all students. The 2-6-3-3-3 education structure, which underpins the CBE, is currently being implemented starting from the primary school level. However, the effectiveness of CBE implementation varies across regions due to

several contextual factors. These include the availability of decisive leadership and adequate supervision (Ng'andu, 2022), the presence of skilled and competent teachers (Sifuna & Obonyo, 2019), active stakeholder engagement, efficient communication, and the adequacy of learning resources and infrastructure (Sitienei, 2020; Mpisili, 2022)

Tables 1-3 summarize the national education landscape,, andthen analysis shows that efforts to improvthe ethe implementation of CBE have failed primarily due topersistent reso Public junior schools in Baringo County are severely lacking in adequate teachers, pace, laboratory CT equipment, and finan, Since these resource limitations directly undermine the quality of teaching and learning, the CBE cannot fulfil its transformative potential. Despite these interventions, there is a significant gap in the research that specifically examines how the management challenges described above influence CBE delivery in Baringo County. The existence of this gap points to the need for further research on how challenges in resource management affect CBE implementation.

Despite the national commitment to strengthen Competency-Based Education (CBE), its implementation across Kenya has been uneven, with rural and marginalized counties such as Baringo experiencing disproportionately greater challenges. While CBE is designed to cultivate practical skills, creativity, and learner-centered instruction, its success heavily depends on adequate human, physical, ICT, and financial resources, as well as effective school-level management. However, emerging evidence shows that many public junior schools in Baringo County continue to struggle with acute teacher shortages, limited training opportunities, inadequate classrooms and laboratories, insufficient digital infrastructure, and persistent financial constraints. These conditions undermine the core principles of CBE, which require well-equipped learning environments and competent teachers who can facilitate experiential learning. Although several national studies have examined CBE implementation broadly, there remains a

limited understanding of how these specific resource management challenges influence implementation outcomes in Baringo County, thereby creating a critical gap that necessitates focused investigation.

Table 1

Statistics on CBE Resources Available in Baringo County Junior Schools in 2024

Sub County & Challenges	Tiaty	Baringo North	Baringo Central	Baringo South	Mogotio	Eldama Ravine	Average
Average Teacher pupil ratio	1:100	1:90	1:80	1:80	1:75	1:75	1:80
Average JSS classrooms per school	1	2	2	1	2	2	2
Average Pupil-textbook ratio per school	1:20	1:15	1:10	1:10	1:10	1:9	1:15
Average no of computers per school	1	1	1	1	1	2	1
Average number of laboratories per school	1	1	1	1	1	1	1
Number of teachers trained on CBE per school	1	1	1	1	1	2	1

Source: Baringo County Education Office, 2024

Table 2

Statistics on the Best Recommendations According to KICD

Requirement	Ratio
Average Teacher pupil ratio	1:40
Average JSS classrooms per school	4
Average Pupil-textbook ratio per school	1:1
Average no of computers per school	20
Average number of laboratories per school	3
Number of teachers trained on CBE per school	12

Source: Kenya Institute of Curriculum Development (2016)

Table 3

Comparison of Tables: CBE Resources in Baringo County Junior Schools vs. KICD Recommendations

Category	Baringo County Average (Table 1)	KICD Recommendations (Table 2)	Gap
Teacher-Pupil Ratio	1:80	1:40	The teacher-pupil ratio in Baringo is twice the recommended ratio, indicating understaffing.
Average JSS Classrooms per School	2	4	Schools in Baringo have only half the required classrooms.
Pupil-Textbook Ratio per School	1:15	1:1	Textbooks are inadequate, with 15 students sharing one book on average.
Number of Computers per School	1	20	There is a severe shortfall, with schools having only 5% of the recommended computers.
Number of Laboratories per School	1	3	Schools have only one-third of the required laboratories.
Teachers Trained on CBE per School	1	12	Schools have only 8% of the trained teachers needed.

Source: (Researcher's Computation from Tables 1 and 2)

1.2 Statement of the Problem

The implementation of Competency-Based Education (CBE) in Kenya continues to face systemic obstacles, particularly in rural and marginalized areas such as Baringo County. Although the national rollout of CBE was intended to promote learner-centred, skills-oriented education, many public junior schools in Baringo operate under severe resource constraints that directly undermine the curriculum's requirements. Schools in the county continue to struggle with persistent shortages of trained teachers, overcrowded classrooms, inadequate instructional materials, insufficient ICT infrastructure, and chronic financial limitations.

These conditions create learning environments that are misaligned with the demands of CBE, which relies heavily on practical activities, digital integration, individualized instruction, and continuous assessment. While existing studies have explored CBE implementation at the national or county level, they have not sufficiently examined how specific resource management challenges particularly in the human, physical, ICT, and financial domains interact to influence curriculum delivery in Baringo County's public junior schools. This gap in localized evidence limits policymakers' and school leaders' ability to develop targeted interventions that address the unique needs of this region. Therefore, there is a need for an in-depth investigation into how these resource management challenges affect the effective implementation of CBE in Baringo County, to inform context-appropriate strategies for strengthening curriculum delivery and improving learning outcomes.

1.3 Objectives of the Study

1.3.1 General Objective

The objective of this study was to examine the impact of selected resource management challenges on the implementation of the Competency-Based Curriculum in public junior schools in Baringo County, Kenya.

1.3.2 Specific Objectives

Specifically, the study sought to;

i. To establish the impact of selected human resource management challenges on the implementation of CBE in public junior schools in Baringo County, Kenya.
ii. To determine the impact of selected physical resource management challenges on the implementation of CBE in public junior schools in Baringo County, Kenya.
iii. To analyse the impact of selected ICT resource management challenges on the implementation of CBE in public junior schools in Baringo County, Kenya.
iv. To investigate the impact of selected financial resource management challenges on the implementation of CBE in public junior schools in Baringo County, Kenya.

1.4 Research Hypothesis

$H0_1$: There is no statistically significant impact of Human Resource Management Challenges on the implementation of CBE in public junior schools in Baringo County

$H0_2$**:** There is no statistically significant impact of Physical Resource Management Challenges on the implementation of CBE in public junior schools in Baringo County.

$H0_3$: There is no statistically significant impact of ICT Resource Management Challenges on the implementation of CBE in public junior schools in Baringo County

$H0_4$: There is no statistically significant impact of Financial Resource Management Challenges on the implementation of CBE in public junior schools in Baringo County

1.5 Justification of the Study

This study is vital for three reasons: it aimed to examine the management challenges that restrict the effective implementation of the CBE in public junior schools in Baringo County, Kenya. The success of the CBE is critical to preparing students for the skills needed in the 21st century. Yet, implementation has faced serious hurdles, with human, physical, ICT, and financial resources chief among them. If the challenges were explored as intended by the study, then insights into the interventions needed to influence policy formulation and resource allocation could trickle down unidirectionally to education stakeholders.

Moreover, although studies on CBE implementation have focused mainly on the national level, research specifically addressing the management challenges of implementation in Baringo County was scarce. The geographic and socio-economic diversity present here illustrates how addressing these management issues would aid in formulating context-specific strategies that will impact learning outcomes. The study thus laid a strong foundation for targeted strategies that would benefit not only Baringo but also other similarly marginalized areas in Kenya.

1.6 Significance of the Study

This study is significant in many ways. Firstly, it may yield important information on the management problems that are hindering the implementation of CBE in Public Junior

Schools in Baringo County. Such identification of pertinent issues involving human resources, infrastructure, ICTs, financial resources, and instructional materials may guide policymakers, school administrators, and other education stakeholders in developing strategies to overcome these hurdles. This is crucial for the successful launch and future sustainability of CBE, enhancing the quality of education and skills development for learners in Baringo County.

Secondly, this research may contribute to the existing body of knowledge on CBE implementation in Kenya, especially in rural and underserved regions. Given that few studies focus on management challenges in Baringo County, this study sought to fill a gap in environmental recommendations that can be applied in similar contexts across the nation. These findings could ultimately be taken into account alongside the need for equitable resource allocation and support to schools facing the most severe implementation challenges, to influence national educational reforms.

1.7 Scope of the Study

This study was delimited to selected management challenges affecting the implementation of CBE in public junior schools in Baringo County, Kenya. The research concentrated on human resources challenges, physical resources challenges, information and communication technology challenges, financial resource challenges, and instructional material challenges. The study localized the issue by involving respondents from different schools in the six sub-counties of Baringo County.

1.8 Assumptions

The study made the following assumptions:

i. The respondents were to be available to answer the questionnaire questions correctly and truthfully.

ii. In addition, the study assumed that the semi-structured interview guide and questionnaire used for data collection would accurately measure the study's constructs.

1.9 Limitations of the Study

One limitation of this study is that it was confined to Baringo County, Kenya, which may reduce the applicability of the findings to areas with different socioeconomic or infrastructural conditions. The corresponding delimitation is that the study intentionally focused on this specific geographic area to allow for a detailed, context-specific examination of resource management challenges in implementing the Competency-Based Education (CBE) framework. Another limitation is the reliance on self-reported data, which may introduce bias since respondents' perceptions may not fully reflect objective realities. The delimitation is that self-reported data were collected to capture the personal experiences and perceptions of school administrators and teachers, which are central to understanding resource management challenges. A further limitation is the sample size of 197 respondents, which might not fully represent all school-level variations in the county.

The delimitation is that the study deliberately targeted this sample size to provide manageable yet sufficient data for meaningful analysis within the study's scope. The cross-sectional design of the study is also a limitation, as it prevents the analysis of changes or trends over time. The delimitation is that a cross-sectional approach was chosen to provide a snapshot of resource management challenges at a specific point in

time, making the study feasible within available resources and time constraints. Finally, focusing primarily on resource management challenges, guided by Kotter's Eight-Step Process, may have overlooked broader political or policy factors, and the framework did not fully address obstacles unique to rural schools. The corresponding delimitation is that the study deliberately narrowed its scope to resource management issues to maintain focus and depth, while acknowledging that other factors may also influence the implementation of CBE.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter provides a comprehensive review of literature relevant to the study by examining theoretical, empirical, and conceptual perspectives on resource management challenges affecting the implementation of Competency-Based Education (CBE). The chapter begins by outlining the guiding theoretical framework that informs the study's focus on change processes within educational institutions. It then synthesizes empirical studies on human, physical, ICT, and financial resource constraints in various academic contexts, highlighting current knowledge, emerging patterns, and documented gaps. Through this review, the chapter establishes the scholarly foundation for the study. It identifies the specific gaps that justify an investigation into resource management challenges in public junior schools in Baringo County. The chapter concludes with a conceptual framework that illustrates the relationships between the study variables and guides the interpretation of the research findings.

2.2 Theoretical Framework

This section reviews the relevant theories that are related and applicable to this study. This study reviewed the change management theory and how it guided the study.

2.2.1 Change Management Theory

Change management theory is a relevant part of the CBE implementation because it provides a systematic framework for managing the complex transition from traditional educational practices to a learner-centered approach. Implementation of CBE requires not only curricular changes but also substantial changes in the education students receive, in the allocation of resources, and in practices and stakeholder engagement. Kotter's theory can effectively address these multifaceted challenges through building a

sense of urgency and creating a guiding coalition; therefore, it is also a suitable framework for this study.

The change management theory used in the present study is Kotter's Eight-Step Process for Leading Change, introduced by John Kotter in 1996. This theory is particular about the phase-by-phase process of managing transitions and consisted of the following steps: raising awareness of the importance of transition and forming a group of change agents, developing and communicating a vision of change, empowering the change process, and searching for and adopting tangible victories, strengthening the gains made, and finally, integrating the new behaviour into organizational culture. Kotter emphasizes leadership and communication as the top strategic responsibilities within organizations for successfully managing change (Salman & Broten, 2017).

However, there has been common critiques that Kotter's theory has been argued to be somewhat linear and prescriptive for change management processes, which are generally non-linear. The critics also note that the theory gives limited consideration to employees' emotional responses and employee rebellion, while it emphasizes only the processes of change (Salman & Broten, 2017). However, none of the above criticisms undermines the application of the theory in the process of implementing the CBE in junior schools in Baringo County.

Although Kotter's (1996) Eight-Step Change Model remains widely used, several scholars argue that it oversimplifies the complexity of organizational change. One major criticism is that Kotter presents change as a linear, sequential process, yet real-world change is often fluid, iterative, and unpredictable. According to Burnes (2017), organizational change rarely unfolds in a step-by-step manner; instead, it is shaped by shifting conditions, power dynamics, and external pressures. This makes Kotter's model

appear overly prescriptive and less adaptable to contexts such as education reform that require flexible and responsive strategies.

Another critique highlights the model's limited attention to the emotional and psychological dimensions of change. While Kotter emphasizes leadership and communication, he pays comparatively little attention to how individuals react to change, including fear, anxiety, or resistance rooted in job insecurity (Appelbaum et al., 2012). These emotional factors are especially important in educational transitions like CBE implementation, where teachers often experience uncertainty regarding new pedagogical expectations. Armenakis and Bedeian (1999) argue that successful change depends strongly on shaping employees' beliefs, readiness, and attitudes elements that Kotter's model touches on only superficially.

Additionally, scholars point out that the model treats leadership as the primary driver of change, potentially underestimating the role of distributed leadership and bottom-up initiatives. Modern organizations, particularly schools, rely heavily on collaborative, shared leadership, yet Kotter's framework still centers authority within a relatively small "guiding coalition" (Todnem By, 2005). This may not fully reflect participatory practices required in curriculum reforms that involve teachers, parents, local communities, and county-level education officers. Furthermore, critics argue that Kotter's model assumes a relatively stable environment in which leaders can implement planned steps. However, implementation of CBE in Kenya including in Baringo County occurs in a context marked by resource limitations, competing political priorities, and deeply entrenched teaching traditions. As Hughes (2011) notes, planned change models often struggle in environments where change is emergent, contested, or influenced by external institutional pressures

By so doing, the implementation of Kotter's theory in the context of the CBE identifies the following strategic areas of concern. First, creating a sense of urgency is essential to ensure that key stakeholders, such as teachers, parents, policymakers, and others, embrace the need to adopt a new curriculum. In developing the guiding coalition, the school leaders, governmental authorities, and community members, with community support, should be enlisted. Making sure that everyone in the CBE system knows what the curriculum aims for is an effective way to utilize resources while ensuring that teachers and the workforce in the system are professionally equipped to carry out the vision. It can be seen that setting short-term goals, which can include improved learning outcomes among pilot schools, can help generate less resistance. Last, reinforcing the concepts of the CBE principles in Baringo's education system is the key to sustainability.

In Baringo County, in particular, where resource constraints and stakeholder resistance are typical, Kotter's framework can be used to systematically address these challenges among school leaders and/or policymakers. This is because, by focusing on leadership, communication, and strategic resource allocation, this proposed study can facilitate improvements in the implementation process of the CBE despite contextual challenges.

2.3 Empirical Review

The empirical review centers on research findings on the management challenges affecting the implementation of Competency-Based Education in junior schools. More specifically, these are challenges in human, physical, ICT, and financial resources. Drawing on existing studies, this review aims to identify gaps and insights that would inform the present investigation, focusing on Baringo County in Kenya. This review provides background on how these management challenges affect the implementation of CBE in junior schools.

2.3.1 Human Resource Management Challenges in the Implementation of CBE Junior in Schools

Ramaditya (2023) analysed strategies employed by private higher education institutions in Indonesia during periods of organizational change and classified them into six categories: efficiency enhancement, quality assurance measures, customer retention initiatives, intensive marketing, development of new academic programs, and mergers and acquisitions. These strategies were found to strengthen institutional resilience amid shifting external conditions. Although the study focused on higher education, its conclusions offer relevant insights for human resource management in basic education. Specifically, the emphasis on strategic capacity building, continuous professional development, and targeted investment in institutional infrastructure aligns with the core requirements for effective CBE implementation in schools. Ensuring that teachers are adequately trained, supported, and equipped reflects a fundamental human resource function that directly influences the quality and sustainability of learner-centred pedagogical reforms such as CBE.

This finding is supported by Mustafa (2023), who highlights the necessity of improving the quality of learning within the education cycle, investing in the provision of appropriate infrastructure, developing curricula that would promote desired assessment systems, and advancing an enhanced teacher education program. These strategies reflect the enormous responsibilities resting on employees across different educational structures and systems, as CBE will need well-skilled personnel to create enticing learning environments. It puts HR managers in schools amongst the many dilemmas of providing the knowledge and skills required for CBE, which remains a significant concern in Kenyan public schools.

Mugabo et al. (2021) examined the implementation of CBE in Rwanda and highlighted the imbalance in professional development, the lack of training, and inadequate remedial resources. The study concluded that continuous teacher training and adequate instructional materials are prerequisites for the successful application of new curricula. Similar challenges are foreseen in Baringo County, particularly among rural schools, where infrastructure constraints and underfunding go a long way in aggravating CBE implementation. Therefore, human resource managers seek to ensure consistency in teacher training programs and in the provision of adequate instructional resources.

Suleiman (2020) explored secondary science teachers' responses to the introduction and implementation of the Competency-Based Education (CBE) in Tanzania using a qualitative research design. Data were collected through interviews, classroom observations, and document analysis from a sample of secondary school science teachers. The study revealed that while most teachers recognized the potential of the CBE to enhance learners' problem-solving, critical thinking, and practical skills, they encountered several implementation challenges.

These included inadequate teacher training, limited teaching and learning materials, overcrowded classrooms, and insufficient time for conducting practical lessons. Moreover, the study noted that many teachers found it difficult to transition from traditional content-based instruction to the learner-centred approach emphasized by the CBE. Suleiman (2020) concluded that although the CBE holds promise for transforming science education in Tanzania, its effectiveness largely depends on the extent of teacher preparedness, availability of resources, and institutional support. The study recommended continuous in-service training, enhanced resource provision, and supportive supervision frameworks to strengthen teachers' capacity and ensure successful curriculum implementation.

Nsengimana (2020) conducted a study on the implementation of the Competency-Based Education (CBE) in Rwanda, focusing on its challenges and opportunities. The study adopted a survey design and noted that Rwanda officially transitioned from a knowledge-based to a skills-based education system in 2015. Data were collected through focus group discussions, surveys, and school visits. The findings revealed that while the CBE was widely recognized as a progressive educational reform, its implementation faced several challenges. These included a shortage of teaching and learning materials, insufficient teaching staff, overcrowded classrooms, inadequate physical and ICT infrastructure, and a lack of science laboratories. Despite these difficulties, the study identified several opportunities to strengthen the system, such as recruiting more teachers, constructing additional classrooms, providing continuous professional development for teachers to align with CBE pedagogical approaches, and increasing the Ministry of Education's provision of curriculum materials to enhance the effective operationalization of the CBE.

Marishane (2020) discussed the role of school leadership in balancing accountability and innovation within the Tanzanian education system. His study revealed the tension between management and leadership, in which school principals grapple with the challenges of implementing CBE while adhering to standardized policies. This is especially true in Baringo County, where principals must balance management expectations with the adoption of innovative approaches to CBE implementation. Human resource managers and supervisors play a significant role in supporting principals undertaking this leadership task by implementing teacher training and encouraging innovative teaching methods.

Tuyishime and Rwibasira (2022) conducted a study on the preparedness of teachers for the Competency-Based Curriculum (CBE) rollout in primary schools in Kigali, Rwanda.

Using a descriptive survey design, the researchers found that although teachers expressed positive attitudes toward CBE, their actual readiness was significantly constrained by inadequate training, limited access to instructional materials, and lack of ongoing professional support. The study revealed that teachers struggled to interpret the curriculum designs, develop performance-based assessments, and integrate ICT tools into competency-focused lessons. These challenges reflect critical human resource issues that directly hinder CBE implementation. The authors recommended continuous professional development, school-based mentorship programs, and increased investment in teaching resources, findings that are directly applicable to junior schools in Baringo County, where similar HR constraints persist.

In Tanzania, Mathias (2023) examined the challenges of CBE in the Magu District, focusing on public secondary school teachers. The study identified problems such as inadequate in-service training, fears about completing the syllabus, certification issues, and rigid timetabling. This study implies that human resource managers must address certification concerns and manage workload. Also, the study suggests that fostering teacher dedication could be enhanced through a consistent program of professional development, underscoring the critical role of human resource management in overcoming the constraints hindering CBE.

Akala (2021) critically analyzed the challenges encountered during the early stages of implementing the Competency-Based Education (CBE) in Kenya. The study highlighted several impediments, including insufficient human and material resources, misalignment between curriculum content and pedagogical approaches, and inadequate public involvement in the reform process. Akala concluded that the CBE rollout had been undertaken hastily, without sufficient preparation or stakeholder engagement. The study emphasized the need for urgent interventions to address these challenges and maximize

the intended benefits of the CBE, ensuring that learners fully benefit from the new educational framework.

In Kenya, Isaboke et al. (2021) identified many challenges to the implementation of CBE in public pre-primary schools; at the top of the list are inadequate facilities, large class sizes, untrained teachers, and a lack of teaching materials. As in Baringo County, the study reveals that improvements in teacher recruitment, infrastructure development, and increased parental involvement are vital for monitoring the successful implementation of CBE. The study notes that government intervention to hire more teachers and build more classrooms could help alleviate the high teacher-pupil ratios that impede the personalised teaching methods CBE requires.

Abdullahi (2020) conducted a study to examine school-related factors influencing the implementation of the Competence-Based Curriculum (CBE) in pre-schools within Garissa Sub-County, Kenya. The study adopted a descriptive research design and collected data through questionnaires and interview schedules. Findings revealed that the majority of public pre-primary teachers were female and professionally trained to teach at that level. However, a significant proportion (68%) of these teachers had not received any formal training on how to implement the new curriculum. The study also identified a shortage of instructional resources, particularly digital learning equipment, which posed a significant challenge to effective CBE implementation. Based on these findings, Abdullahi (2020) recommended that the Ministry of Education should enhance the supply of instructional materials, especially ICT equipment, to public pre-primary schools to facilitate curriculum implementation.

Additionally, the study called for continuous training and capacity-building programs for preschool teachers to strengthen their understanding and application of the CBE. However, the study's reliance on self-reported data collected through questionnaires and

interviews may have introduced bias. To address this limitation, the current study employed a mixed-methods approach, incorporating observational checklists, document analysis guides, questionnaires, and interview schedules. The use of observation and document analysis helped verify self-reported data, thereby improving reliability. Moreover, Abdullahi's study did not explore teachers' perceptions of the CBE or their ability to utilise digital media in curriculum delivery. To address these gaps, the current study investigated how public primary school teachers' perceptions of CBE influence its implementation and examined their capacity to use ICT tools in facilitating competence-based learning.

Moreover, Momanyi and Rop (2019) and Sitenei (2020) provide significant insights into the human resource challenges involved in implementing CBE in Bomet and Kibera, Kenya, respectively. The study conducted by Momanyi and Rop (2019) in Bomet East Sub-County revealed that teachers did not receive adequate training on CBE and had limited knowledge of new pedagogical and assessment methods. The study cited a greater need for in-service training for them. Work by Sitenei (2020) showed that classrooms were overcrowded, and a high teacher-student ratio made it challenging to implement CBE. Teachers in Kibera have turned these difficulties into reality through limited time for practical lessons and insufficient teaching and learning materials, among others, hindering the proper implementation of the curriculum.

Cheboi and Nyongesa (2020) conducted a study to examine the impact of teaching materials on learners' literacy development in government pre-primary schools in Webuye West Sub-County, Kenya. The study found that most schools lacked adequate instructional materials to facilitate language skill acquisition among learners. This shortage of teaching and learning resources was shown to negatively affect the development of language knowledge in pre-school children, thereby hindering the

effective implementation of the Competence-Based Curriculum (CBE). Based on these findings, the researchers recommended that both the National and County Governments should prioritise the provision of adequate learning and instructional materials in pre-primary schools. This support would enhance language development and strengthen the overall implementation of the CBE at the foundational learning level.

Ngeno (2023) observed that a considerable number of teachers in Kericho County lacked adequate training in competence-based instruction. The study emphasised that addressing the shortage of qualified instructors exacerbated by the growing number of learners requires a strategic focus on curriculum delivery, particularly on improving methods of student performance assessment. To bridge this gap, the author recommended continuous teacher training and the recruitment of educators who are already well-versed in the Competence-Based Curriculum (CBE). The findings underscore the critical role of teacher competence in ensuring the successful implementation of the CBE, highlighting that the effectiveness of the curriculum largely depends on the availability of adequately trained, skilled, and proficient teachers who can effectively translate the curriculum's goals into classroom practice.

David (2020) examined the influence of teacher-related factors on the implementation of the Competence-Based Curriculum (CBE) in lower primary schools in Luanda Sub-County, Vihiga County. The study revealed that teachers' qualifications significantly affected the practical implementation of the CBE, underscoring the importance of professional competence in curriculum delivery. Similarly, Gathin (2021) emphasised that the expansion and successful adoption of competency-based education require highly skilled teachers, as teaching is a complex and multidimensional process that demands a deep understanding of both content and pedagogy. Teachers must be able to synthesise, integrate, and apply their knowledge and skills across diverse learning

contexts. To achieve this, Gathin (2021) recommended that teacher training should be rigorous and continuous, incorporating regular in-service seminars and workshops aimed at improving instructional competence. The author further argued that an effective education system must prioritize the continuous retooling and professional development of teachers to ensure sustained and effective implementation of the curriculum.

Munyasia and Maureen (2021) conducted a study on Kenya's Vision 2030 and the efficacy of the Competency-Based Education (CBE) in primary and secondary schools in Siaya County, Kenya. The study emphasised that the successful implementation of CBE relies heavily on the sustainability of key educational resources, particularly the availability of well-trained teachers. Without adequate teacher preparation, the realisation of quality education as envisioned in Sustainable Development Goal (SDG) No. 4 would be at risk. The researchers noted that the shortage of teachers, coupled with rising student enrollment, poses a significant challenge to the effective implementation of the curriculum. Using a projection model to forecast future trends, the study found that teacher recruitment in Siaya County is projected to grow by 9.81% between 2024 and 2030. Additionally, teacher establishment in Junior Secondary Schools (JSS) is expected to rise by 33.44% from 2021 to 2030, while teacher requirements are anticipated to increase by 29.63% between 2026 and 2030.

Khamala and Simiyu (2021) examined teacher capacity and school-level resource readiness for the implementation of the CBE in Bungoma County, Kenya. The study adopted a mixed-methods approach involving interviews with school heads and surveys of teachers. Findings revealed that most teachers lacked mastery of learner-centred teaching techniques and formative assessment approaches integral to CBE. Additionally, the study identified inadequate staffing, heavy workloads, and insufficient government support as major impediments to curriculum delivery. According to the researchers, the

shortage of trained teachers, coupled with limited opportunities for in-service training, contributes to low levels of teacher preparedness. These findings reinforce the argument that human resource management plays a pivotal role in building teacher competence and ensuring functional implementation of CBE, especially in regions with staffing gaps similar to Baringo County.

Kamau (2022) carried out a study on the implementation of the Competency-Based Curriculum (CBE) in public primary schools in Nyeri County. Using a qualitative case study approach, the author found that while school administrators supported the curriculum shift, teachers faced numerous HR-related obstacles, including inadequate orientation on curriculum content, minimal supervision, and limited pedagogical support from Curriculum Support Officers (CSOs). Teachers reported feeling overwhelmed by the demands of continuous assessment, parental engagement, and adaptation to new teaching methods without sufficient training. The study concluded that successful CBE implementation depends heavily on robust HR interventions, including structured teacher induction, targeted professional development, and supportive supervision areas where educational authorities in Baringo County must invest significantly to ensure smooth curriculum implementation.

Even though other studies have provided insight into the role human resources play in enabling solid CBE implementation across different geographical locations, none have specifically focused on how human resource management challenges affect public junior schools in the context of Baringo County, Kenya. Baringo County has unique socio-economic and infrastructural features that, combined with the specific needs of the CBE, necessitate an in-depth analysis of how human resource challenges influence its implementation at the junior school level. The objective of this study was to bridge the gap by examining the effect of human resource management on the success of CBE

implementation in Baringo County. This study addresses a critical gap in the literature by examining this under-researched aspect of Competency-Based Education (CBE) implementation. It provides in-depth insights into CBE practices and offers evidence-based recommendations to enhance educational outcomes in the targeted area.

2.3.2 Physical Resource Management Challenges to Implementation of CBE in Junior Schools

Effective teaching under the Competence-Based Curriculum (CBE) relies heavily on the competence and adequacy of teaching staff. Sitienei (2020) emphasises that having a sufficient number of well-trained teachers is essential for successful CBE implementation. The availability of qualified personnel to oversee and support the process directly influences the quality of learning outcomes. Munyasia and Olel (2020) predict that demand for trained teachers will continue to rise as Kenya moves toward full implementation of CBE. Similarly, Omondi and Achieng (2020) highlight the importance of understanding teachers' competencies and their ability to deliver CBE objectives effectively. However, their study primarily focused on student performance and did not comprehensively examine all the factors influencing CBE's role in enhancing learners' outcomes.

Resource availability is another critical factor in implementing educational strategic plans. Adequate resources must be accessible to the implementation team to ensure that all components of the strategic plan are executed as intended. Mumbua and Mingaine (2015) observe that in many instances, available resources fall short of the strategic plan requirements, thereby reducing implementation efficiency and hindering the achievement of intended objectives. The CBE is particularly resource-intensive due to its emphasis on practice-based and experiential learning (Labani et al., 2019). Implementation requires active learner engagement across various activities, which demands substantial materials

and infrastructural support (Mpisili, 2022). Sitienei (2020) notes that essential resources such as textbooks, teachers' guides, and information and communication technology (ICT) equipment remain inadequate in many schools. Consequently, the lack of sufficient resources adversely affects CBE implementation, limiting the development of learners' skills and knowledge and impeding teachers from achieving the intended curriculum goals (Ng'andu, 2022; Momanyi & Rop, 2020).

Tuyishime and Rwibasira (2022) examined teacher readiness for competency-based instruction in public primary schools in Rwanda. Their study revealed that teacher competence was significantly constrained by inadequate training, limited exposure to CBE methodologies, and insufficient ongoing support from education authorities. Teachers struggled with lesson design, assessment of competencies, and integration of practical activities core components of CBE. The study emphasised that without well-prepared teachers, the curriculum shift cannot achieve its intended learning outcomes, underscoring the importance of both numbers and professional capability of staff.

According to the World Bank (2021), buildings, classrooms, laboratories, and other educational infrastructure form essential components of an effective learning environment. Sossion (2019) emphasises the importance of maintaining small class sizes in Kenya, in line with UNESCO's recommended standards, to promote personalised learning. He further advocates the provision of key infrastructure facilities, such as computer laboratories, workshops, and libraries, and the construction of additional classrooms to accommodate the growing number of learners resulting from the government's 100% transition policy from primary to secondary education. Similarly, Hawa (2018) concurs that classrooms constitute the backbone of school resources, stressing the need for well-designed, spacious, and aesthetically appealing learning spaces that enhance learners' comfort and engagement. The study also underscores the

government's responsibility to provide adequate physical facilities, including classrooms, laboratories, workshops, libraries, and sports fields, to create a conducive environment for the effective implementation of educational programs.

The study conducted by Yaro (2023) examined how school infrastructure affects policy implementation in public secondary educational institutions across Sokoto State, Nigeria. A quantitative research method examined 159 schools across three senatorial zones, using the Krejcie and Morgan (1970) table to determine the sample size. The research data shows that inadequate facilities, along with poor infrastructure, lead to poor educational outcomes. Yaro stresses that both providing the necessary educational resources effectively and their proper management are vital elements for implementing sustainable educational policies while enabling effective teaching and student learning. The present study identifies a critical weakness in the existing educational infrastructure, which requires the Government and educational stakeholders to unite and improve learning conditions to secure academic success for present and future generations.

A study by Majdi et al. (2023) aimed to examine the nature, enactment, and evaluation of CBE models in the United States and South Korea to draw inferences and develop strategies for better CBE implementation in Kenya. The research design used was a scoping review of peer-reviewed articles from various databases, focusing on empirical evidence on CBE implementation and assessment across the three countries. These participants took part in screening, data extraction, and quality assessment done using a tailored rating scale based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension checklist for scoping reviews.

In South Africa, teachers' roles as curriculum leaders were studied (Bessong & Ogina, 2022), focusing on four schools (two semi-urban and two rural) in the Vhembe district. The findings indicated that teachers carried out their curriculum leadership tasks by

participating in instructional activities and organising school- and community-based curriculum activities. Based on these findings, the researchers recommended ensuring adequate supply and support to provide the resources and infrastructure for learner-centred pedagogy, so students can benefit from a better educational experience. However, the research does not represent the physical resource challenges caused by school heads. Hence, this study will investigate the physical resource challenges that hinder CBE in junior secondary schools in Baringo County. The study elucidated additional management physical resource challenges facing schools during the implementation of CBE in the project area in Zanzibar, Tanzania. As it utilized a Design-Based Research approach and a single-group quasi-experimental design, the data for this study were collected from section leaders and teachers working in 15 secondary schools. The results of the research suggest that these physical resources greatly influence school leaders' ability to support teachers in implementing CBE and acquire the competencies needed for leaders and, likewise, for teachers. Recommendations from this study, such as workshops organised by the Ministry of Education, are added to the list of recommendations on the critical role of physical resource constraints in the implementation of CBE in schools.

The qualitative research study aimed at defining the public challenges faced by Physics teachers under CBE using inquiry-based teaching and learning methods was embarked on by Dusabimana and Mugabo et al. (2022). Data was collected through semi-structured interviews. The sample comprised three purposefully selected Physics teachers from a pool of 50 lower secondary school teachers in the Gakenke District of the Northern Province of Rwanda. Thematic analysis was used in data analysis. The findings suggested several challenges encountered during participants’ engagement with the physical competence-based curriculum, including a scarcity of physical resources,

limited time, and students' poor English. Researchers recommended that policymakers implement continuous training at the school level to enhance the planning and implementation of CBE. This study aims to examine the physical resource challenges facing school managers in Baringo County, Kenya.

The limited availability of physical resources hinders teaching, as learners find it challenging to engage in classroom activities (Sidow, 2022) fully. A study conducted by KIE in 1994 revealed that Non-Formal Schools commonly faced challenges related to inadequate physical facilities suitable for effective teaching and learning. Some issues highlighted included insufficient and unsuitable physical resources. There is no denying that inadequate physical facilities affect both teaching and learning processes. Curriculum designers must ensure that they support the recommended program, even by providing some requisite materials, so that its implementation runs smoothly.

Laboratory facilities serve as critical infrastructure for the effective implementation of the Competence-Based Curriculum (CBE), providing learners with practical, hands-on experiences essential for developing skills and competencies. A study conducted by Mokoro (2020) in Tanzania found that the implementation of the CBE has faced significant challenges, resulting in limited effectiveness and the retention of traditional, theory-based instructional practices. The study further noted that rising enrollment in public primary schools has exacerbated these challenges, straining available resources and limiting access to essential laboratory facilities for practical learning.

Mwenda and Kihoro (2021) emphasised that the availability of learning resources, such as textbooks, computers, and other digital tools, is fundamental to the successful implementation of the Competence-Based Curriculum (CBE). They observed that the absence or insufficiency of these resources significantly constrains teachers' ability to deliver the curriculum effectively and limits learners' opportunities to develop the

intended competencies. Similarly, Ouma et al. (2021) highlighted that inadequate sanitation facilities, including insufficient toilets and limited access to clean drinking and washing water, adversely affect CBE implementation. Poor hygiene conditions not only compromise learners' health and attendance but also disrupt the conducive learning environment necessary for effective curriculum delivery.

Nazimana (2021) conducted a study on the challenges teachers face in implementing Competency-Based Education (CBE) in Ugandan secondary schools. The study employed a descriptive survey design and involved 50 teachers, 4 head teachers, and 4 education officers in Gulu City, Uganda. The findings revealed that teachers encountered numerous challenges in their efforts to implement CBE, including severe infrastructural deficiencies such as inadequate classrooms, science laboratories, computer labs, theatre rooms, and ICT infrastructure. Additionally, the study found that the number of teachers was insufficient, and many lacked the pedagogical knowledge, skills, and attitudes necessary for effective implementation of the curriculum. Other challenges identified included limited parental involvement, shortages of curriculum materials, inadequate government funding, and minimal financial support for program effectiveness. The study concluded that these challenges highlight the need for stronger stakeholder engagement, increased investment in teacher training and professional development, and continuous institutional support to ensure the smooth and effective implementation of the CBE in Uganda’s secondary schools.

Ndayambaje (2018) noted the challenges faced in the Rwandan educational institutions during the implementation of the CBE. The report stated that some primary school teachers had difficulty adapting to changes and thus opted to remain with traditional methods, despite having undergone training in CBE implementation. Ndayambaje (2018) further highlighted the lack of sufficient physical resources, alongside teacher resistance,

as one of the main factors impeding the effective rollout in Rwanda. This underlines the need to put in place physical resources and further train teachers, so as to embrace and adapt to the CBE for successful implementation.

In 2012, Muhimbili University of Health and Allied Sciences (MUHAS) introduced organised CBE in its programs, while other health professional training institutions retained conventional teaching, leading to a divergence in graduates' competencies. The study aimed to assess the experiences of various stakeholders regarding the implementation of CBE in Biomedical Sciences at MUHAS, with an eye toward harmonizing competency-based curricula across three health professional training institutions in Tanzania (Sirili et al., 2023). The descriptive case study design was used to explore CBE implementation in the Medicine and Nursing programs, involving graduates of MUHAS, their immediate supervisors, faculty members, and continuing students within MUHAS. In-depth interviews with some purposefully sampled subjects led to the development of focus group discussions, while data analysis continued with qualitative content analysis (Sirili et al., 2023).

Challenges evident from the data gathered include a shortage of faculty, limited physical facilities, and problems with accommodation and library resources. The study reported and reviewed the need for multi-stakeholder engagement, including public and private sector representatives from the health, higher education, and finance sectors, to tackle the identified challenges and deliver a sustainable intervention framework that guarantees effective CBE implementation for medical and nursing schools in Tanzania.

In Kenya, Ngeno, Mweru, and Mwoma (2021) conducted a study to examine the relationship between the availability of physical infrastructure and the implementation of the Competence-Based Curriculum (CBE). The researchers employed a descriptive survey and correlation research design. The target population consisted of 24 County

Support Officers (CSOs), 524 head teachers, and 610 Grade One teachers, from which a sample of six CSOs, 52 head teachers, and 61 Grade One teachers was drawn. Data collection methods included interview schedules, questionnaires, and observation checklists. Quantitative data were analysed using descriptive statistics, including percentages, means, and standard deviations, while inferential statistics were analysed using the Pearson product-moment correlation. Qualitative data were analysed thematically by identifying key themes and sub-themes. The findings revealed that physical infrastructure had a moderately positive effect on CBE implementation. For head teachers, the correlation coefficient was 0.336 (p=0.029), while for Grade One teachers, the correlation was 0.285 (p=0.03).

The study also identified notable shortages in physical infrastructure, particularly in specialized facilities such as nutrition and music rooms, which had mean scores of 2.18 and 1.88 for head teachers and 1.39 and 1.35 for Grade One teachers, respectively. Furthermore, the study found that teacher preparation had a moderately positive influence on CBE implementation, with correlation coefficients of 0.494 (p = 0.00) for head teachers and 0.369 (p = 0.005) for Grade One teachers. These findings underscore the critical role of both physical infrastructure and teacher preparedness in the effective implementation of the CBE in Kenyan primary schools.

Mugabo et al. (2021) did a case study in Rwanda that attempted to establish the relationship between school's characteristics and the extent of CBE implementation success. The study found that immense CBE disparities between teaching staff can be attributed to the inadequate available physical resources as well as inadequate infrastructural capacity in our schools. The study recommended therefore that due to lack of adequate physical resources and CBE itself, teachers should attend extremely regular

quantity and quality of in-service CBE programs, in-order to accomplish the cross-cutting cross-learning focus CBE set by the Ministry of Education.

Nsengimana (2020) conducted a study to explore the opportunities and challenges associated with implementing a Competence-Based Curriculum (CBE) in Rwanda. Data were collected through focus group discussions, surveys, and school visits to gain comprehensive insights from various education stakeholders. The findings revealed that the new curriculum was generally well-received by educators and learners, signalling a positive attitude toward the reform. However, several challenges were identified, the most notable being the shortage of teaching and learning materials, inadequate laboratory equipment, and limited access to essential chemical reagents. To overcome these challenges, teachers recommended stronger collaboration between the government and other education stakeholders to ensure adequate resource provision and support. Additionally, the study emphasized the importance of continuous professional development for in-service teachers, tailored to their subject areas and English language proficiency, given that English serves as the primary medium of instruction in Rwanda's education system.

Otieno and Wambua (2021) investigated teacher preparedness for CBE implementation in Kisumu County using a descriptive survey design. The study found that although most teachers had received some initial CBE training, many lacked deeper pedagogical skills necessary for competency-based instruction, such as facilitation of learner-centred activities, development of performance tasks, and formative assessment techniques. The researchers concluded that inadequate teacher preparation and limited opportunities for professional development significantly hinder effective CBE delivery. They recommended continuous in-service training and mentoring to strengthen teacher competence.

Cheruiyot (2024) used a qualitative study approach to evaluate the obstacles encountered by junior schools in Kenya in implementing the CBE. The researcher visited junior schools to see the implementation of the CBE directly and conducted in-person interviews with 47 head teachers and educators. Thematic content analysis was used to examine the collected data. The findings indicated that insufficient infrastructure in the majority of schools nationwide is a significant obstacle to the successful implementation of CBE in junior schools. This constraint hinders the provision of excellent education and endangers CBE's overarching developmental objectives.

Kuria (2022) achieved similar results by using a descriptive survey approach to investigate the relationship between school readiness and the effective implementation of CBE. Data were collected via questionnaires from a sample of 80 respondents, including teachers, school administrators, and sub-county education directors from Nairobi City County. The collected data was examined using descriptive statistics. The results indicated that the majority of schools in the city were ill-equipped for CBE implementation owing to insufficient infrastructure, which obstructs the effective execution of the new curriculum.

Mucheni (2021) conducted a study on teachers' perspectives regarding the implementation of the Competency-Based Education (CBE) in Kenya, employing a mixed-methods approach to explore educators' views and experiences. A total of 53 teachers were sampled for the study, and data were collected using a five-point Likert-scale questionnaire. The collected data were analysed thematically using both deductive and inductive coding techniques. The findings indicated that while professional development programs had been conducted to prepare teachers for CBE implementation, many teachers still fell short of meeting the minimum quality standards required for effective curriculum delivery. Although adequate curriculum materials had been

published to support teaching and learning, the study revealed concerns about the quality of textbooks provided. Furthermore, the study identified significant inadequacies in physical and ICT infrastructure, including insufficient laboratory facilities, which hindered effective teaching and learning under the CBE framework.

Mwita and Onyango (2022) examined the difficulties that often arise in teaching the theoretical aspects of a given composition content in the curriculum and in transferring it directly to the development of products at a practical level, emphasising, among others, the quality and availability of school physical resources. The focus of its research was to assess the effects of the quality and availability of physical resources on CBE implementation among teachers of grades 1, 2, and 3 in public primary schools in Migori County, Kenya. Using a descriptive survey design, the research respondents include 604 head teachers, 1,812 grade 1-3 teachers, and 8 sub-county quality assurance and standards officers. The study found a strong positive relationship between the availability of physical resources and the achievement of CBE implementation; thus, the quality of these resources is critical for successful curriculum delivery in CBE. It is also recommended to take an urgent step to implement the result-based approach in anticipation of delivery and effective CBE implementation. It also suggested that future research would be needed to determine how schools can radically improve or eliminate the complicated logistical problems of managing physical educational resources.

In conclusion, Kathuni et al. (2023) sought to find out the relationship between the adequacy of physical resources and the practical implementation of CBE in public primary schools in Tharaka Nithi County, Kenya. The research indicated that inadequate physical facilities negatively affect the effective implementation of CBE, finding a statistically significant relationship between the adequacy of physical resources and the success of implementing the competence-based curriculum. Recommendations were

made for state intervention to ensure adequate physical resources are made available to all public primary schools, thereby enabling the implementation of the competence-based curriculum with success.

Ng'eno et al. (2021) conducted a study on the influence of physical infrastructure on the implementation of the Competency-Based Education (CBE) in public primary schools in Kericho County, Kenya. The study employed a descriptive survey design and involved 6 Curriculum Support Officers (CSOs), 52 head teachers, and 61 Grade 1 teachers. Data were collected using interview schedules, questionnaires, and observation checklists. The findings revealed that the availability of physical infrastructure had a positive effect on CBE implementation, with a correlation coefficient of 0.336 ($p = 0.029$) for head teachers and 0.285 ($p = 0.03$) for Grade 1 teachers. However, the study also noted significant shortages of specialised physical facilities, such as nutrition and music rooms, which recorded low mean scores of 2.18 and 1.88, respectively. Grade 1 teachers reported response rates of 1.39 and 1.35 for the availability of nutrition and music laboratories, respectively. Additionally, findings showed that teacher preparation had a moderately positive influence on CBE implementation, with head teachers reporting a correlation of 0.494 ($p = 0.00$) and Grade 1 teachers showing a correlation of 0.369 ($p = 0.005$), both of which were statistically significant.

Cheruiyot (2024) investigated the obstacles hindering the rollout of the Competence-Based Curriculum (CBE) in Kenya's junior schools through thematic content analysis of secondary literature, observations, and stakeholder interviews. The study identified several key challenges affecting the successful implementation of the CBE. These included inadequate teacher training, which left many educators feeling unprepared to deliver the new curriculum; limited physical resources, such as insufficient textbooks, digital tools, and classroom infrastructure, particularly in rural and marginalised areas;

and resistance to change from teachers, parents, and learners unfamiliar with CBE methodologies. Additionally, infrastructural deficiencies and unreliable internet connectivity further widened the implementation gap. Cheruiyot (2024) concluded that addressing these challenges requires a comprehensive, multi-dimensional approach. This includes investing in targeted and continuous teacher training programs, enhancing resource distribution, strengthening stakeholder engagement, and improving school infrastructure. The study emphasised that proactively tackling these issues is crucial to ensuring a successful and equitable CBE implementation that equips Kenyan learners with the essential skills and competencies to compete effectively in a globalised world.

The physical infrastructure of Kenyan schools plays a critical role in the effective implementation of the Competency-Based Education (CBE) (Ngeno et al., 2021). Adequate infrastructure is essential to ensure that learners receive high-quality instruction aligned with the curriculum's requirements and to support the practical delivery of CBE. Ngeno (2021) emphasised that schools must be equipped with facilities that promote experiential, hands-on learning, a central component of CBE. Such facilities include fully furnished laboratories, workshops, and farming plots, enabling students to undertake practical projects that deepen their understanding of the subject matter.

While these studies stand out, a notable gap remains in research on the management challenges posed by physical resources for school managers operating in junior secondary schools in Baringo County, Kenya. To address the aforementioned gap, this paper aims to identify and analyse these challenges to improve CBE implementation in the area.

2.3.3 ICT Resource Management Challenges to the Implementation of CBE Junior in Schools

Fabito et al. (2022) sought to elucidate the challenges that computing students experienced as they adjusted to an online learning environment, particularly during the Enhanced Community Quarantine period due to COVID-19 in the Philippines. The study found that students faced significant problems, including an inability to clarify topics with professors, a lack of dedicated study areas, and poor Internet connectivity. These problems revealed the lack of preparedness of students and faculty alike for what was, in fact, a sudden shift to online learning. The study implied that faculty members' views should be included to validate student feedback and further investigate barriers not detected by the initial survey, tackling ICT resource management problems that might hinder CBE implementation in junior schools in Baringo County, Kenya.

Whitelock, Goshtasbpour, Pitt, Ferguson, and Cross (2024) examined the complexities of building capacity for digital education, also referred to as technology-enhanced learning (TEL), within higher education. Their study explored digital education as a dynamic system comprising interconnected elements, including people, technologies, and resources. The researchers emphasised that the interdependent nature of these components, spanning IT infrastructure, digital content, student feedback mechanisms, and diverse technological and human actors, creates both opportunities and challenges. They advocated for careful management of this intricate system through mapping the interdependencies among its components to clarify processes, improve information flow, and identify systemic gaps that hinder knowledge and data exchange. Drawing on their earlier work on the challenges and opportunities arising during the Covid-19 pandemic, Whitelock et al. (2024) underscored the importance of structured introductions to new technologies and pedagogical models. They concluded that targeted, deliberate capacity-

building efforts are essential for fostering sustainable, effective growth in digital education.

Sweeney (2024) explored students' experiences with educational technology in the United Kingdom (UK) to support university learning. The study found that the UK government had made significant investments in educational technologies across all levels of education. Nevertheless, the author noted that additional ICT resources were still required to adequately meet the needs of learners, teachers, and administrators. While insightful, this study was conducted in UK universities, where school and classroom environments differ considerably in terms of ICT infrastructure compared to other contexts. Furthermore, the focus on technology integration within the UK university curriculum does not directly align with Kenya's Competency-Based Education (CBE).

Adu and Zondo (2024) conducted a study on the integration of ICT in teaching and learning in primary schools in South Africa. Their findings indicated that the availability of ICT tools and content was insufficient to effectively integrate technology in the education of economics for grades 4–12. The researchers concluded that the lack of educational technologies in most schools undermined the intended objectives of ICT use in teaching and learning. However, this study focused solely on one subject area in South Africa.

Lomo, Abonyi, and Ahwireng (2024) conducted a qualitative study to examine the challenges head teachers face in integrating information and communication technology (ICT) into teaching and learning in Ghanaian basic schools. Data were collected through interviews and analysed thematically. The findings revealed that head teachers played a crucial role in promoting ICT integration by organising and facilitating ICT-related training for teachers, supervising their use of ICT in classrooms, procuring and

mobilising ICT resources, and ensuring proper maintenance of the infrastructure. However, the study identified several challenges that hindered adequate ICT support, including limited funding for ICT equipment, inadequate stakeholder involvement in resource provision, insufficient teacher training, insufficient infrastructure (such as electricity and internet connectivity), and high maintenance costs for ICT facilities.

Mapisa and Makena (2024) examined the influence of Information and Communication Technology (ICT) adoption on teaching and learning in primary schools within the Amathole East District of Eastern Cape, South Africa. Their study revealed that government-aided primary schools were critically under-resourced, lacking essential ICT tools, including computers, reliable internet connectivity, digital projectors, institutional websites, email systems, computer laboratories, and interactive whiteboards. This scarcity of digital infrastructure significantly restricted teachers' and learners' access to ICT resources, thereby limiting their ability to integrate technology into classroom instruction.

The researchers attributed this situation primarily to the insufficient financial capacity of both the national government and individual school administrations. Despite growing recognition of the importance of ICT in facilitating modern pedagogical approaches, schools were unable to acquire the necessary educational technologies or develop functional ICT infrastructure. As a result, integrating e-learning and other digital instructional modalities remained largely unfeasible in most public primary schools across the district.

Moreover, the study's scope was limited to public primary schools, leaving out technology integration practices within private primary schools, which may have different funding models and resource availability. This omission restricts the generalizability of the findings to the broader educational context in the region. The

authors also acknowledged that the socio-economic and administrative environment in South Africa differs considerably from that in Kenya, particularly in terms of government funding structures, ICT policies, and community support systems.

These contextual differences highlight a clear gap for further inquiry, particularly regarding how diverse educational systems manage financial barriers to ICT integration. For Kenya, where the Competency-Based Curriculum emphasises digital literacy as a core competency, understanding the relationship between funding, technology access, and instructional quality becomes even more critical. Future research may therefore focus on comparative analysis or localised studies to explore how financial, infrastructural, and policy factors shape ICT adoption in different settings.

The findings by Mapisa and Makena (2024) underscore the central role of sustained financial investment in enabling the successful adoption of ICT in education. Without adequate resources, schools remain unable to harness the potential of digital technologies to enhance teaching and learning, reinforcing educational inequalities and limiting learners' preparedness for a technologically driven world.

The study conducted by Ngeno, Mweru, and Mwoma (2021) in Kenya highlighted the significant influence of physical infrastructure on the practical implementation of the Competence-Based Curriculum (CBE). The authors noted that facilities such as computer laboratories and ICT classrooms designed for practical learning are essential components for achieving the objectives of CBE. However, many public primary schools face an acute shortage of specialised rooms, mainly due to rising student enrollment. The study established a clear correlation between the adequacy of physical infrastructure and the successful implementation of CBE. In addition to ICT facilities, the researchers identified other critical infrastructural elements that affect CBE implementation, including the establishment and construction of laboratories, music and creative arts

rooms, and the expansion of school libraries. They also emphasised the importance of providing sufficient play materials, agricultural tools, ICT resources, and adequate outdoor spaces for physical education and activities. The study underscored the urgent need to enhance school infrastructure to create an environment conducive to competence-based learning. Consequently, these findings are particularly relevant in assessing how infrastructural factors influence the implementation of CBE in public primary schools in Kigumo Sub-County.

Yildirim and Sensoy (2018) assessed the impact of integrating technology into the teaching and learning of science among seventh graders in Turkey. While the study not only encompassed an appropriate view of students' intentions toward technology integration, it also highlighted disparities within it; for instance, the extremes of low-income students without mobile technology and public primary schools in Pakistan with insufficient access to technological support. In spite of such challenges, the majority of teachers perceived technology integration as beneficial to education rather than a challenge, highlighting the need to address access challenges to successful CBE implementation.

Nawzad et al. (2018) compared the effectiveness of technology-integrated science education with that of traditional methods in Iran. The findings revealed an increase in interest levels, reportedly persistent, and improvements in general learning outcomes among students in technology-approach classes. This indicates that it is imperative to ensure schools have sufficient ICT resources to implement CBE effectively. Van Wyk (2021) undertook a qualitative study in Zambia that explored teachers' readiness to integrate digital technologies into distance learning. The study found that teachers' confidence, competence with technology, and access to resources were significant determinants of technology integration. This finding is relevant to public primary school

teachers in Kenya, as it indicates that issues of access to ICT resources, whilst addressing teachers' confidence and competence, are pertinent to the integration of ICT in CBE implementation.

Murithi and Yoo (2021) examined the role of ICT in education, drawing evidence from public primary institutions within the CBE framework in Kenya. The study reported a mismatch between the perceived importance of ICT in promoting the realization of educational goals and the actual number of resources available in schools. According to the findings, the facilities the teachers reported did not suffice for implementing ICT in the curriculum, as they had limited access and could not be meaningfully integrated into pedagogical practices. The study further corroborated this argument, noting that ICT resource management challenges, if left unaddressed, would remain a critical drawback as the CBE is implemented. Supporting the implementation of the CBE requires proper recognition, coordinated access, and support for ICT resources.

Mulenga and Kabombwe (2019) note that the Zambian government needs to invest in ICT infrastructure to support schools' curricula sensitive to CBE. He notes that teachers continue to use local cyber cafes to locate educational information, which could compromise the integrity and confidentiality of some assessment content. ICT resources in schools must be supported to create e-education, which will, in turn, influence real-time online assessments.

Omboto et al. (2022) assessed the status of ICT resources in public primary special schools in Nairobi County, Kenya. The study acknowledged that schools had regular access to ICT resources through the Digital Literacy Programme. Specialised ICT resources, however, were absent in some instances that catered to children with special needs. Moreover, the minimal utilisation of regular ICT resources by the teachers and administration for teaching and learning activities was due to a lack of technical skills

and the difficulty in using the devices. The study recommended greater vigilance. He also affirmed the importance of ICT management challenges if not addressed in their implementation.

Isaboke et al. (2021) explored teachers' readiness to integrate ICT into teaching lower-primary pupils in Borabu Sub-County, Kenya. The author concluded that lower-primary teachers ' self-perceptions on E-education integration are influenced by their attitudes towards the use of ICT, training background, and self-efficacy. Generally, the teachers were underprepared in using ICT in education. Training personnel might be essential to ensuring that teachers become adept and familiar with ICT use in instruction, which is important for effective implementation of CBE.

The integration of technology into teaching and learning allows both teachers and learners to engage in innovative tasks and generate new ideas, promoting a deeper understanding of knowledge. Digital tools and resources play a crucial role in monitoring learners' progress and in adjusting instructional methods to meet individual learning needs. However, Okello (2022) emphasises that current in-service and pre-service teacher training programs are often insufficient in equipping educators with the necessary information and communication technology (ICT) skills. This shortfall limits teachers' capacity to use technological tools effectively in classroom instruction. For the successful implementation of Competency-Based Education (CBE), teaching also requires access to a range of teaching aids, well-equipped laboratories, and practical tools that support experiential learning (Emmanuel et al., 2023).

Njagi et al. (2020) examined the challenges of ICT integration in the management of secondary schools in the South Rift region of Kenya. The study revealed that most public secondary schools lacked adequate educational technologies and ICT infrastructure. Teachers reported that the few available resources were primarily donations or project-

based contributions from private companies or foreign donors. Once these programs ended, the government did not assume responsibility for providing the necessary technologies. Moreover, the study highlighted several challenges associated with the limited ICT resources, including frequent equipment breakdowns, poor maintenance, susceptibility to viruses and cybercrime, insecurity, power outages, and unreliable internet connectivity. Murithi and Yoo (2021), in their study on technology integration in the implementation of Competency-Based Education (CBE) in public primary schools in Kajiado North Sub-County, found that most schools lacked essential ICT resources, such as internet connectivity and projectors, hindering teachers from effectively incorporating technology into their lessons.

Using a mixed-methods descriptive research design that included surveys, interviews, and observations, Chepkilot (2024) conducted a study on the relationship between school preparedness and the implementation of the Competency-Based Education (CBE) in public primary schools in Baringo County, Kenya. The purpose of the study was to evaluate various factors, including infrastructure, teaching resources, readiness for information and communication technology (ICT), teacher training, and staffing levels. According to the findings, which align with additional research published by the same author, poor infrastructure, limited teaching materials, low levels of information and communication technology (ICT) competency among instructors, and a lack of resources are significant obstacles to the adoption of CBE. The results of the statistical research showed a favourable correlation between higher levels of school readiness and a more successful implementation of CBE measures. Based on the study's findings, it is concluded that resolving these shortcomings through improved infrastructure, better resource allocation, enhanced teacher training (especially in information and

communication technology), and adequate staffing will significantly enhance the implementation of child care in Baringo County.

Despite this understanding, as outlined in various articles, there remains a gap for further examination: the ICT resource management challenges experienced by school managers in junior secondary schools in Baringo County, Kenya, have not yet been the focus of any appreciable external research. This study sought to fill this gap by identifying and analysing these challenges to make CBE implementation more feasible in the region.

2.3.4 Financial Resource Management Challenges to Implementation of CBE in Junior Schools

The practical implementation of educational reforms, such as the CBE, is greatly dependent upon adequate financial resources and sound management. Several studies conducted across the globe agree on the importance of financial resources to achieving educational goals. A report by the Global Partnership for Education (GPE, 2021), for instance, reveals that inadequate funding and poor resource allocation are the main obstacles to learning in the majority of countries surveyed. Resource constraints in several instances lead to the unavailability of requisite teaching and learning materials, inadequate opportunities for teacher training, and overall low levels of school performance.

Alameddine and Makarem (2021) conducted a study to examine the influence of Competency-Based Education (CBE) on student achievement in the United States. The researchers employed a systematic review approach, analysing existing literature on the outcomes of CBE on student performance. Their findings revealed that CBE positively impacts student achievement, with particularly notable benefits for low-performing learners. This success was attributed to CBE's individualised, flexible structure, which enables students to progress at their own pace and focus on mastering specific

competencies. The authors further observed that CBE is especially effective for students who are disengaged or disconnected from conventional educational systems, as it promotes active participation and ownership of learning. However, they also identified several challenges to effective CBE implementation, including the need for well-structured instructional resources, robust assessment and feedback systems, and comprehensive teacher training and support. The study concluded that addressing these challenges is crucial to maximising CBE's potential to enhance educational outcomes across diverse learner groups.

Thomas Bossuroy, Clara Delavallade, and Eliana La Ferrara (2021) conducted a study examining the impact of school library resources on educational achievement in rural Ugandan primary schools. Using a randomised controlled trial design involving 80 schools, the study established a strong positive relationship between the availability of library resources and student performance, particularly in reading and mathematics. The researchers found that enhancing school libraries with additional materials such as books, textbooks, and other learning aids led to notable improvements in learners' academic outcomes. Interestingly, the study revealed that the positive effects of library resources were more pronounced among girls than boys, suggesting that libraries play a crucial role in advancing gender equity in education. Overall, the research underscored the vital role of school libraries in improving learning outcomes, especially in resource-limited educational environments.

A study conducted by Adebayo, Ntokozo, and Grace (2020) examined the impact of educational resources on students' academic performance in South African schools, focusing on disparities between wealthy and less wealthy institutions. Despite increased educational expenditures aimed at improving outcomes in under-resourced schools, the expected progress had not been realised, with affluent schools consistently

outperforming their poorer counterparts. Using data from the 2015 Trends in International Mathematics and Science Study (TIMSS), the researchers analysed the relationship between resource availability and academic achievement. The findings indicated that although educational resources contributed to improved student performance, their influence was relatively modest compared to other determinants such as effective school management, accountability systems, and student motivation. The study concluded that simply increasing educational resources is insufficient to address the systemic challenges within South Africa's education sector, emphasising the need for a more holistic approach that integrates resource provision with institutional effectiveness and learner engagement.

In the African context, management of financial resources poses serious challenges to education reforms. From a comparative analysis study across multiple African countries, Amunga et al. (2020) deduced that inadequate government funding results in infrastructure and resource deficits in the majority of countries. In Benin, for instance, schools are unable to deliver quality education due to a lack of infrastructure and teacher training, as only 10% of the education budget is allocated to infrastructure. Chad is also affected by similar problems. Consequently, resource deficits become widespread across the continent, as resource constraints prevent quality education in the long term. Despite the inadequacy of resources, their management and use are often misapplied and misappropriated (Too et al., 2024). These findings suggest that unless financial resources are reengineered to support educational reforms, as in the case of the CBE, the successful implementation of these reforms may be unattainable in many cases.

Marion (2020) conducted a study that identified several key challenges teachers face when implementing Competency-Based Education (CBE) in public schools. A major issue highlighted was the difficulty of managing large class sizes, which limited teachers'

ability to deliver CBE instruction effectively. The study also revealed a shortage of instructional materials, particularly in subjects such as Music and digital literacy, which constrained teachers' capacity to foster practical and creative learning. Furthermore, many teachers faced difficulties integrating digital literacy, problem-solving, and critical thinking skills into their lessons, as they were still developing these competencies themselves and lacked sufficient digital learning resources. While most teachers prepared lesson plans that aligned with CBE requirements, they expressed concerns that the training they had received was inadequate in both depth and duration. Marion (2020) recommended that, to enhance the successful implementation of CBE, efforts should be made to improve classroom infrastructure, increase the availability of teaching and learning materials, and provide continuous, comprehensive teacher training.

An investigation in East Africa by Ntumi et al. (2023) found that severely limited financial resources severely constrained the implementation of the National Pre-Tertiary Education Curriculum Framework in Ghana. The study showed that the lack of financial resources led to ill-prepared, poorly skilled teachers with insufficient instructional materials to implement the curriculum through teaching and learning effectively. However, Ghana was not the only country in the region that lacked financial resources to actualise education reforms. The study presents findings from neighbouring countries, where financial inadequacies impact the learning environment and educational processes. For example, a study in Uganda revealed that insufficient funding could cause teachers to lack the resources for training, which, in turn, affects how they implement the curriculum in their classrooms (Nzarirwehi & Atuhumuze, 2019).

In the Kenyan context, challenges in accessing education-related financial resources have attracted considerable attention. Public spending on education, according to the Kenya National Bureau of Statistics (KNBS, 2021), has not kept pace with the rising costs of

implementing the new curriculum. Momanyi and Rop (2019) found in a separate study that financial readiness profoundly affects the effective implementation of CBE in public primary schools. The findings revealed that many schools lack the financial resources necessary to establish the infrastructure, teaching materials, and teacher training that are vital for successful curriculum implementation. Waruingi et al. (2022) suggested that financial challenges affect principals' efforts to implement CBE, as they later face challenges sourcing funds for educational resources and other professional training matters. Amunga et al. (2020) argued that teachers with prior training in a different curriculum will require continued training to implement CBE successfully. This challenge becomes more intricate when adequate funds are not allocated to in-service teacher training programs. Besides, it is aggravated by the meagre allocation of funds for monitoring and evaluation, which is a prerequisite for accountability and effective curriculum implementation.

In Baringo County, financial resource challenges are particularly pronounced, creating a complex environment that affects the effective delivery of education. The region, characterised by vast geographical expanses and socio-economic disparities, relies heavily on government allocations to sustain school operations. However, many schools continue to experience budgetary shortfalls that limit their ability to meet the increasing demands of contemporary education. These shortages make it difficult to plan adequately for both recurrent and development expenditures, thereby compromising the overall functioning of educational institutions within the county.

A recent study by Obara (2019) highlighted the unique financial constraints faced by schools in Baringo County, underscoring that funding from both the national and county governments remains insufficient. According to the study, schools often receive funds that fall short of their operational needs, making it challenging for administrators to

implement planned programs effectively. The funding discrepancies are further exacerbated by delays in disbursement, which disrupt financial planning and force schools to rely on short-term borrowing or measures that are not sustainable in the long term.

These funding gaps directly hinder schools' capacity to procure essential teaching and learning materials. In many institutions, shortages of textbooks, laboratory equipment, and instructional aids limit the delivery of Curriculum-Based Instruction and impede learner engagement. Teachers, who often try to compensate for these deficiencies through improvisation, still struggle to provide a holistic learning experience because essential instructional resources are lacking. Consequently, learners in Baringo County may not receive the same quality of education as their counterparts in better-resourced counties.

Infrastructure development is another critical area severely affected by limited financial resources. Schools in Baringo County continue to grapple with inadequate classrooms, dilapidated buildings, insufficient sanitation facilities, and lack of electricity in some remote areas. The inability to construct or maintain essential facilities not only compromises students' learning environments but also influences their attendance and retention. In regions with harsh weather conditions, the need for resilient infrastructure becomes even more critical, yet financial constraints make such investments difficult to achieve.

Furthermore, the limited funding impacts career development opportunities for teachers and education personnel. Professional development programs, workshops, and refresher courses require financial investment that many schools cannot afford. As a result, teachers' capacity to implement modern pedagogical practices, integrate Competency-Based Curriculum (CBE) approaches, and keep up with evolving educational standards

is constrained. This skill gap ultimately affects the quality of teaching and learning outcomes across the county.

The financial challenges facing schools in Baringo County create a systemic barrier to the attainment of quality education. The combination of insufficient funding, delayed disbursement, underdeveloped infrastructure, and limited investment in human resource development contributes to a cycle of underperformance. Addressing these challenges requires a coordinated effort from national and county governments, development partners, and community stakeholders to ensure that schools receive adequate and timely resources. Without such interventions, the educational disparities experienced in Baringo County are likely to persist, undermining efforts to achieve equity and quality in Kenya's education system.

Mulangi (2024) conducted a study on financial administration challenges affecting the implementation of the Competency-Based Education (CBE) in public primary schools in Taita Taveta County, Kenya. The study adopted a descriptive survey design and targeted a population of 1,764 participants, including head teachers, deputy head teachers, and Board of Management chairpersons. Primary data were collected using questionnaires, and Nassiuma's formula was applied to derive a sample of 95 respondents from the total population.

The findings revealed a positive relationship between delayed CBE fund disbursement and the implementation of CBE in public schools within the county ($r = 0.741$, $p = 0.027$). Additionally, the study established a strong positive relationship between financial accountability and CBE implementation ($r = 0.619$, $p = 0.023$). Based on these results, the study recommended adequate and relevant training for teachers to enhance their preparedness for CBE implementation, timely disbursement of CBE funds, and

prudent financial management to promote efficiency in the execution of the curriculum in public primary schools in Taita Taveta County.

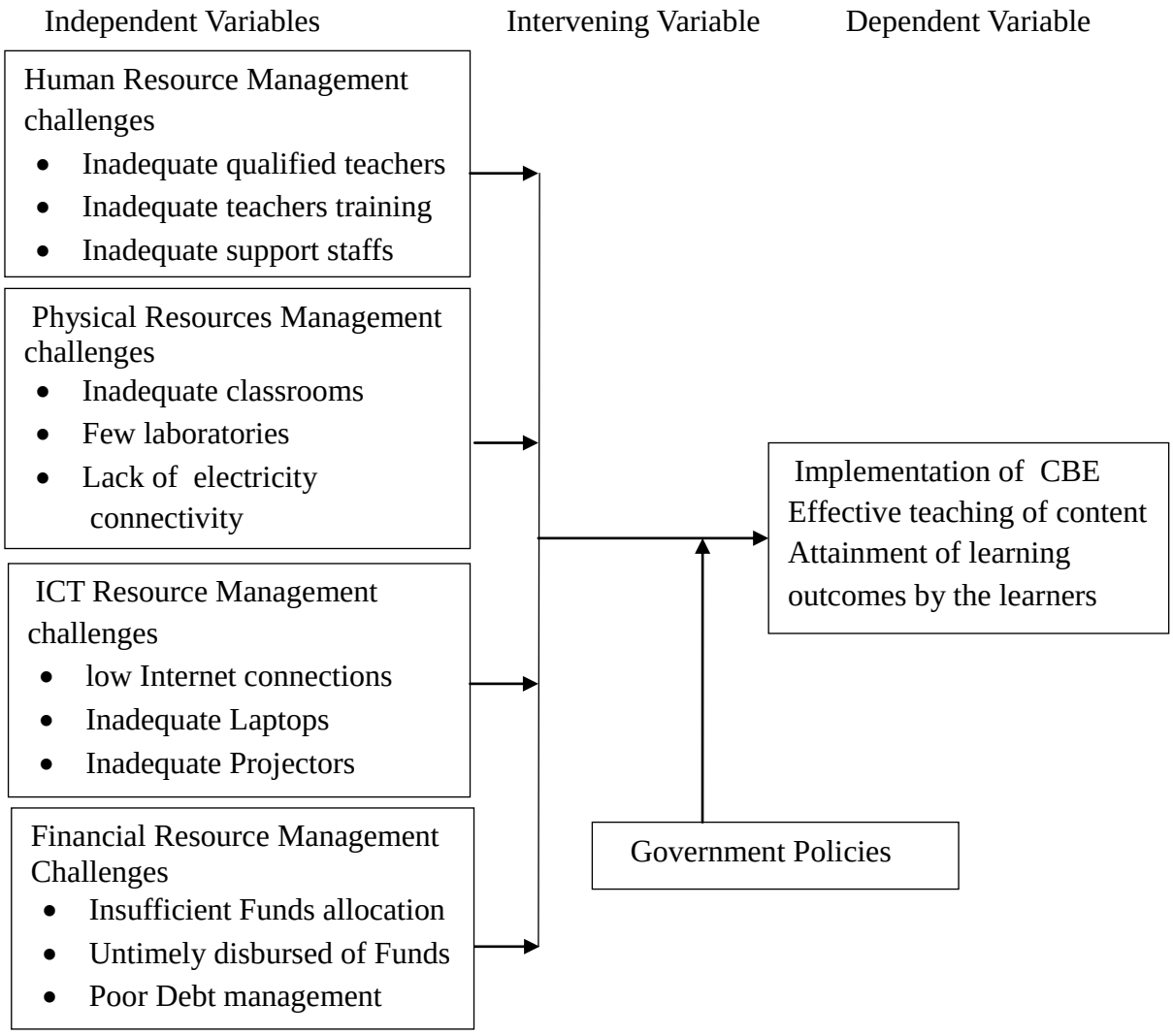
While previous studies have focused on financial resource challenges encountered in implementing educational reforms, a significant gap remains regarding the specific context of junior schools in Baringo County. In view of this, this study sought to fill this gap by examining how financial resource constraints hinder the implementation of the CBE in Baringo County.

2.4 Conceptual Framework Showing the Relationship between the Variables

The independent variables were the impact on the teaching and learning process, which, in turn, influenced the effectiveness of the implementation of the Competency-Based Curriculum.

Figure 1

Conceptual Framework



Source: Author (2025)

The conceptual framework of this study illustrates how various resource management challenges influence the implementation of Competency-Based Education (CBE). Human resource challenges, such as insufficient numbers of qualified teachers, limited teacher training, and inadequate support staff, can directly hinder schools' capacity to deliver CBE effectively. Similarly, physical resource constraints, including inadequate classrooms, limited laboratories, and unreliable electricity and connectivity, create an environment that is not conducive to learner-centred teaching. ICT challenges, such as low internet connectivity, insufficient laptops, and a lack of projectors, further impede

the integration of technology, which is critical for modern CBE practices. Financial resource challenges, including inadequate funding allocation, untimely disbursements, and poor debt management, affect the availability and sustainability of the resources required for effective CBE delivery. Together, these independent variables create barriers that can compromise the quality and effectiveness of teaching and learning under CBE.

The dependent variable, implementation of CBE, is reflected in the effectiveness of content delivery and in learners' attainment of learning outcomes. The framework also recognises the role of intervening variables, particularly government policies, which can either facilitate or constrain the relationship between resource challenges and CBE implementation. By providing guidelines, regulations, and strategic support, policies can moderate the effects of resource limitations, shaping the extent to which schools can achieve intended learning outcomes

2.5 Summary of Reviewed Literature

The reviewed literature demonstrates that the successful implementation of Competency-Based Education (CBE) relies heavily on the adequacy and effective management of human, physical, ICT, and financial resources within schools. Scholars consistently emphasize that teacher preparedness, availability of instructional materials, digital infrastructure, and sustainable funding are foundational to learner-centred pedagogies and skill-based learning. Studies across Africa and beyond reveal that shortages in trained teachers, weak professional development systems, inadequate classrooms and laboratories, poor ICT integration, and chronic underfunding continue to undermine the shift from traditional content-based instruction to CBE. The literature, therefore, establishes that resource management remains a core determinant of curriculum implementation outcomes.

Despite general agreement on the importance of resources, existing research presents several inconsistencies. Some studies argue that teacher competence and training are the strongest predictors of CBE success, while others maintain that physical infrastructure or ICT provision has a greater influence. Several authors find a direct link between resource adequacy and curriculum implementation, whereas others report weak or inconsistent relationships, suggesting that leadership, attitudes, or policy alignment may play a larger role. Another point of debate concerns the relative impact of financial resources: while many studies highlight budget constraints as a major barrier, some argue that strategic management and innovation can overcome resource limitations even in low-resourced environments. These scholarly contradictions suggest that the influence of resource management is highly context-specific and may vary significantly across regions.

The empirical review reveals significant gaps in geographical focus, methodological approaches, and thematic scope. Many studies have been conducted at national or urban levels, leaving rural and marginalized counties underrepresented. Most research also examines single resource dimensions such as teacher capacity or ICT without analysing the combined effect of multiple resource management challenges on CBE implementation. Additionally, many studies rely on descriptive designs and do not employ inferential analyses to establish the strength or significance of relationships between variables. Few studies explore resource management from the perspective of junior schools, despite their central role in the current CBE/CBE transition.

Although several Kenyan studies highlight broad implementation challenges, very few have examined how human, physical, ICT, and financial resource management challenges interact specifically within the marginalised context of Baringo County. This region faces unique constraints, including geographical remoteness, teacher shortages, limited infrastructure, poor connectivity, and persistent funding delays. However,

existing literature does not provide empirical evidence on how these resource challenges collectively influence CBE implementation in junior schools within the county. This lack of localised, multi-variable evidence limits the development of targeted interventions to improve curriculum delivery in Baringo.

This study addressed the identified gap by systematically analysing the combined effects of human, physical, ICT, and financial resource management challenges on the implementation of CBE in public junior schools in Baringo County. Unlike previous studies, it adopted a comprehensive approach integrating quantitative and qualitative data, employed inferential statistics to establish the significance of each resource dimension, and focused specifically on a marginalised rural context where CBE implementation struggles are most pronounced. By generating context-specific evidence, the study fills a critical knowledge gap. It provides actionable insights for policymakers and educational stakeholders seeking to enhance CBE implementation in similar resource-constrained settings.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The chapter discussed the research design, study location, study population, sampling procedure, and sample size. Additionally, it covered data collection instruments, validity and reliability measures, data collection procedures, data analysis techniques, presentation methods, and ethical considerations.

3.2 Research Philosophy

Research philosophy refers to the belief about how new knowledge will be developed through data collection, analysis, and interpretation. It is also a system that generates new, reliable knowledge about a particular research problem (Cazeaux, 2017; Novikov & Novikov, 2019). This study adopted positivism as a research philosophy. This is because it is objective and based on information collected through observation, leaving no room for subjectivity. Its objective nature allows the study to draw logical conclusions about the relationships generated by the hypothesis. Pham (2018) posits that it entails applying natural science methods to study concepts that are more closely aligned with the social sciences. This creates grounds for understanding that social life concepts must be supported by evidence. In addition, Hammersley (2013) explains that its objective nature makes the research reliable and supports the formulation of scientific hypotheses. The philosophy advocates knowledge free from bias and truth that can be proven by accurate observations, which will always inform reality (Ryan, 2018).

3.3 Research Design

The study used a descriptive design that enabled the systematic study of naturally occurring phenomena in educational settings, including the observation of current conditions and the detection of trends, patterns, and relationships without manipulating

variables (Sileyew, 2020; Patel & Patel, 2019; Siedlecki, 2020). Quantitative data were captured using structured questionnaires administered to head teachers and junior school teachers, focusing on indicators such as teacher preparedness and resource availability, while rich qualitative data were gathered through face-to-face interviews with head teachers, teachers, and sub-county directors regarding the challenges encountered during CBE implementation. Statistically analysed quantitative data provided empirical rigour, and thematic analysis of the qualitative data added contextual depth to the study, ensuring that the conclusions were robust and practically relevant.

3.4 Location of the Study

This study was conducted in Baringo County, Kenya, located in the Rift Valley region. Baringo County is predominantly rural and administratively divided into seven sub-counties: Baringo Central, Baringo North, Mogotio, Baringo South, Tiaty East, and Tiaty West. The county's varied geographical features, including widespread, dispersed communities, mountainous terrain, and semi-arid conditions, posed unique challenges for educational delivery. Baringo County was selected for this study due to its pronounced challenges in educational infrastructure, resource allocation, and geographical isolation. As noted by Kerosi and Olando (2021), the county's marginalised status in terms of access to ICT and instructional materials made it a suitable location to examine how resource constraints affect the implementation of the Competency-Based Curriculum (CBE) in rural Kenya.

Established channels with local education authorities and community leaders facilitated access to the study sites. They allowed the research team to manage travel logistics, navigate rugged terrain, and address potential language barriers effectively. During data collection, cultural differences and local norms were respected, and translation support was arranged when necessary. Informed consent was obtained from all participants,

confidentiality was maintained, and safety considerations for fieldwork in remote areas were taken into account. These measures ensured that the study was conducted in a respectful, secure, and ethically sound manner while safeguarding both the research team and the participants.

3.5 Population of the Study

The target population for this study comprised the key stakeholders involved in implementing Competency-Based Education (CBE) in public junior schools in Baringo County. The population totalled 1,739 individuals, comprising 532 head teachers, 1,200 junior school teachers, and seven sub-county education directors. This population was considered appropriate for the study as it encompasses those directly responsible for the management, coordination, and administration of CBE thereby providing critical insights into the human, physical, ICT, and financial resource challenges that influence the effectiveness of curriculum implementation.

The distribution of schools across the seven sub-counties of Baringo County reflects the heterogeneity of both geographical and resource-related challenges confronting the education sector. Engaging this population allowed the study to capture diverse perspectives on administrative and operational barriers to CBE implementation, ensuring that the findings are both representative and contextually relevant. The table below presents the detailed distribution of schools within each sub-county, highlighting the breadth and variability of the study context.

Table 4

Number of Schools in Baringo County

Sub County	Number of Schools
Baringo Central	78
Baringo North	140
Mogotio	71
Baringo South	87
Tiaty East	32
Tiaty West	33
Eldama Ravine	83
Total	532

Source: (Kenya National Bureau of Statistics, 2015)

Due to the far-flung nature and variability in resource distribution, this target population offers a holistic view of the management problems related to CBE implementation across diverse contexts in the county.

3.6 Sampling Procedure and Sample Size

3.6.1 Sampling Procedure

A stratified random sampling technique was employed to ensure an adequate number of respondents from each of the three categories. This method was considered suitable for the study, as it allowed for the systematic representation of each subgroup, ensuring that the diversity within the target population was appropriately captured. Within each stratum, simple random sampling was applied, giving each individual an equal chance of being selected and thereby minimising the risk of selection bias. Proportional allocation across the seven sub-counties of Baringo County was also implemented to enhance the sample's representativeness, based on the number of schools in each sub-county. Sub-counties with more schools contributed proportionally more respondents, while smaller

sub-counties contributed fewer. The table below presents the number of schools per sub-county alongside the corresponding sample sizes.

Table 5

Number of Schools Sampled from Each Sub-County

Sub County	No. of Schools	Proportionate Sample			
		Head Teachers	Teachers	Directors (Censured)	Sub Total
Baringo Central	78	17	29	1	47
Baringo North	140	30	53	1	84
Mogotio	71	15	26	1	42
Baringo South	87	18	33	1	52
Tiaty East	32	7	12	1	20
Tiaty West	33	7	12	1	20
Eldama Ravine	83	18	31	1	50
Total	524	112	196	7	315

3.6.2 Sample size

The sample size for this study was determined using the Krejcie and Morgan (1970) sample size determination table, which provides a formula for calculating a representative sample for a predefined population. The formula is presented below:

$$S = \frac{\chi^2 NP\,(1 - P)}{d^2(N - 1) + \chi^2 P\,(1 - P)}$$

Where:

- S= sample size
- X= Z-score for desired confidence level (e.g., 1.96 for 95%)
- N= population size (1,739 in this case)

- P= estimated proportion of the population with the characteristic (use 0.5 for maximum variability if unknown)
- d= margin of error (e.g., 0.05 for 5%)

Let's calculate step by step using common assumptions:

- $X = 1.96$(95% confidence)
- $P = 0.5$
- $d = 0.05$
- $N = 1739$

1. Compute numerator:

$$X^2 \cdot N \cdot P \cdot (1 - P) = 1.96^2 \cdot 1739 \cdot 0.5 \cdot 0.5$$

$$1.96^2 = 3.8416$$

$$0.5 \cdot 0.5 = 0.25$$

$$3.8416 \cdot 1739 \cdot 0.25 = 3.8416 \cdot 434.75 \approx 1669.46$$

2. Compute denominator:

$$d^2 \cdot (N - 1) + X^2 \cdot P \cdot (1 - P) = 0.05^2 \cdot 1738 + 3.8416 \cdot 0.25$$

$$0.05^2 = 0.0025$$

$$0.0025 \cdot 1738 = 4.345$$

$$3.8416 \cdot 0.25 = 0.9604$$

$$4.345 + 0.9604 \approx 5.3054$$

3. Compute sample size S:

$$S = \frac{1669.46}{5.3054} \approx 314.6$$

The required sample size was approximately 315 respondents.

The table below represents the sample size and the strata:

Table 6

Sample Size of the Study

Respondents' categories	Population	Sample Size	Criteria
Head teachers	532	112	Krejcie and Morgan's (1970) table of sample sizes
Junior school teachers	1200	196	Krejcie and Morgan's (1970) table of sample sizes
Sub-County directors(Censured)	7	7	Census
Total	1739	315	

Source: Researcher, (2025)

3.7 Instrumentation

Two primary data collection instruments were used in this study: structured questionnaires and semi-structured interview schedules. Quantitative data were collected on management challenges related to human, physical, ICT, and financial resources by the head teachers and junior school teachers using structured questionnaires with mainly closed-ended Likert-scale items. Also, qualitative data were collected from the seven sub-county directors through semi-structured interviews. It is a tool tailored for in-depth exploration of problems, providing respondents with an opportunity to add depth to their experiences and attitudes. These tools were selected for their standardised measures, which allow for statistical analysis of trends and patterns in CBE implementation

challenges. Together, these two instruments offer a thorough analysis by blending the breadth of quantitative data with the depth of qualitative insights.

3.7.1 Pilot Study

The data collection tools were tested in a pilot study to determine their clarity, validity, and reliability. According to Mugenda and Mugenda (2003), a pilot is essential for assessing the likelihood that the tools will produce the expected data and the expected methodological challenges. This 32-participant number was based on the recommendation of Julious (2005) and Hertzog (2008), who recommend that the pilot sample should be approximately 10% of the target sample. The finalised instrument was used with a larger group afterwards, and the pilot study was conducted to enable a more comprehensive study with the final group.

The pilot design implied that eight public junior schools were not involved in the main sampling frame and four respondents of each school were recruited. These 32 people provided the information that guided the process of refining the questionnaires and interview protocols hence ensuring the unambiguity, logical arrangement and easy understanding of the items. A reliability test that involved the use of Cronbach alpha was conducted.

3.7.2 Validity of the Instruments

Validity is the extent to which the instrument measures what it is supposed to measure. To ensure content validity, the structured questionnaires and interview schedules were reviewed by experts in educational management and curriculum studies before the research (Cohen et al., 2017). Furthermore, construct validity was examined by verifying that the instrument items accurately depict the constructs under study, i.e., human resources and ICT resources in the context of CBE implementation (Brazier et al., 2018).

3.7.3 Reliability of the Instrument

Cronbach's alpha was first used to assess the instrument's reliability, with a coefficient of 0.7 or higher considered acceptable, according to Dubey and Kothari (2019). The calculated Cronbach's alpha in the pilot study was 0.756, indicating that the instrument was reliable. This degree of internal consistency was accepted because the investigation was exploratory. The following table shows the outcome of the Cronbach's alpha reliability test.

Table 7

Cronbach Alpha Reliability Test

Reliability Statistics	
Cronbach's Alpha	N of Items
.756	26

The instrument was later used in the main study after the pilot administration, but with a larger sample of respondents. HRM7 (corrected item - total correlation = 0.352) and ICT1 (corrected item - total correlation = 0.314) make a positive contribution to the overall scale reliability. Other items, on the other hand, such as HRM9 (corrected item-total correlation = 0.137) and ICT4 (corrected item-total correlation = 0.111), showed weak correlations, implying that they do not represent the underlying construct. Despite these constraints, the instrument was found to be reliable and suitable for the main study. The lessons learned during the pilot stage helped explain the instrument's performance.

3.8 Data Collection Procedure

The data collection process commenced with obtaining an introductory letter from Kabarak Postgraduate Institute, followed by KUREC providing an introductory letter for NACOSTI ethical consideration. I also obtained permits from local authorities, such as the Director of Education in Baringo County. Upon securing permissions, the researcher

informed the daily heads and sub-county directors of the study's purpose, allowing respondents to voluntarily participate and ensuring confidentiality and anonymity. Questionnaires were administered to the junior school teachers in all seven sub-counties. The researcher visited the schools and personally handed out the questionnaires, which facilitated clarification and ensured their timely completion. A field visit was also conducted to collect completed questionnaires.

Semi-structured interviews were carried out with the seven sub-county directors and the head teachers. Each interview lasted between 45 and 60 minutes and was audio-recorded (with permission) to guarantee accuracy, supplemented with field notes. Follow-ups were conducted through phone calls to ensure a high response rate, and the data were checked for completeness before analysis.

3.9 Data Analysis

Quantitative and qualitative forms of analysis were done to the collected data to have an overall answer to the research questions. The structured questionnaires given to the teachers of junior schools were analyzed both descriptively and inferentially to get the quantitative data. Descriptive statistics were used (frequencies and percentages) to examine demographic characteristics of the respondents and determine their level of knowledge on the issues that are highly influential in the implementation of the Competency Based Education (CBE). The data were keyed and analyzed with the Statistical Package of the Social Sciences.

A CBE Implementation index was calculated to determine the relationship between management challenges (human, physical, ICT, financial, and instructional resources) and the implementation of CBE. The dependent variable in the regression analysis was this index based on the responses of the questionnaires of the principals and the interview of the sub-county directors. The effects of all these management challenges on

the implementation of CBE were analysed through regression analysis. This discussion has shown how each of these challenges influenced CBE implementation in junior public schools. Also, Chi-square tests were used to investigate significant relationships between nominal variables, including school location and resource availability. After running the regression, additional model assumption tests (normality, linearity, multicollinearity, and homoscedasticity) were also conducted to understand whether the findings can be trusted. If any violations were identified, the data were corrected by making the necessary adjustments or transformations.

Thematic analysis was used to analyse the qualitative data supplied by the semi-structured interviews with seven sub-county directors. The audio-taped interviews were transcribed verbatim and reviewed several times to identify recurring patterns and themes associated with management challenges encountered during CBE implementation. The main themes were assigned codes, which allowed learning more about the directors' views. The qualitative results have brought further insight into the pictures that depict in Baringo. The integration of these two methodologies in this analysis facilitated an in-depth examination of the factors that contribute to the adoption of Competency-Based Education in junior public schools.

Table 8

Summary of Statistical Tests and Analysis of Objectives for Qualitative Data

Objective	Independent Variable	Dependent Variable	Method of Analysis	Presentation of Results
1. To determine the impact of human resource management challenges on the implementation of CBE in junior schools	Human resource management challenges	Implementation of CBE in junior schools	Quantitative: Regression analysis and Chi-square tests; Qualitative: Thematic analysis of interviews	Quantitative: Tables, charts, and descriptive statistics; Qualitative: Verbatim quotes and thematic summaries
2. To assess the impact of physical resource management challenges on the implementation of CBE in junior schools	Physical resource management challenges	Implementation of CBE in junior schools	Quantitative: Regression analysis and Chi-square tests; Qualitative: Thematic analysis of interviews	Quantitative: Tables, charts, and descriptive statistics; Qualitative: Verbatim quotes and thematic summaries
3. To evaluate the impact of ICT resource management challenges on the implementation of CBE in junior schools	ICT resource management challenges	Implementation of CBE in junior schools	Quantitative: Regression analysis and Chi-square tests; Qualitative: Thematic analysis of interviews	Quantitative: Tables, charts, and descriptive statistics; Qualitative: Verbatim quotes and thematic summaries
4. To examine the impact of financial resource management challenges on the implementation of CBE in junior schools	Financial resource management challenges	Implementation of CBE in junior schools	Quantitative: Regression analysis and Chi-square tests; Qualitative: Thematic analysis of interviews	Quantitative: Tables, charts, and descriptive statistics; Qualitative: Verbatim quotes and thematic summaries
5. To propose solutions to management challenges affecting the implementation of CBE in junior schools	Proposed solutions to management challenges	Implementation of CBE in junior schools	Qualitative: Thematic analysis of interviews	Verbatim quotes and thematic summaries

3.10 Ethical Considerations

The study was considered low risk as educational personnel were non-invasive data collectors who were not expected to be harmed by the study. Ethical standards were maintained by adhering to strict guidelines to protect participants' rights and avoid any interference with research integrity. All participants were informed about the study's aims and procedures, and that participation was voluntary with the right to withdraw at any time without detriment. Informed consent was obtained from the participants through a written consent form (Appendix VIII). For purposes of confidentiality and anonymity, participants' identities were coded, and the data were stored in locked files on password-protected devices accessible only to research personnel. Every effort was made to minimise discomfort or harm, and the process was conducted sensitively and respectfully, particularly about potentially 'triggering' sensitive subjects. The study's results were communicated in aggregate to participants and other interested parties, while individual responses were kept confidential. The entire research process was carried out in line with ethical standards and approval requirements of NACOSTI and other relevant authorities.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION, AND DISCUSSION

4.1 Introduction

This chapter presents the findings and interpretations of the results based on the study's objective, which was to determine the impact of selected resource management challenges on the implementation of Competency-Based Education in public junior schools in Baringo County, Kenya.

4.1.1 Response Rate

Table 9

Response Rate of the questionnaires

No. of questionnaires Issued	No. Of Questionnaires Returned	Response Rate (%)
200	197	99

Of the 200 questionnaires issued to respondents, 197 were completed and returned, yielding a response rate of 99%. The respondents returned the remaining three questionnaires (1%). According to Mugenda and Mugenda (2003), a 50% response rate is adequate, 60% is good, and 70% or more is outstanding. This response was therefore rated as very good for the study.

4.2 General and Demographic Information

4.2.1 Demographic Information

The following tables give the distribution of the demographics in the study:

Table 10

Sub-County

Sub County					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Baringo Central	29	14.7	14.7	14.7
	Baringo North	53	26.9	26.9	41.6
	Baringo South	33	16.8	16.8	58.4
	Eldama Ravine	31	15.7	15.7	74.1
	Mogotio	27	13.7	13.7	87.8
	Tiaty East	12	6.1	6.1	93.9
	Tiaty West	12	6.1	6.1	100.0
	Total	197	100.0	100.0	

The table shows the distribution of the 197 respondents across the seven sub-counties in Baringo County. Baringo North contributed the largest proportion of respondents with 53 (26.9%), followed by Baringo South with 33 (16.8%) and Eldama Ravine with 31 (15.7%). Baringo Central and Mogotio accounted for 29 (14.7%) and 27 (13.7%) respondents, respectively. Tiaty East and Tiaty West had the smallest representation, each contributing 12 respondents (6.1%). The cumulative percentages indicate that over 50% of the respondents came from Baringo North, Baringo South, and Eldama Ravine sub-counties. This distribution reflects a relatively balanced representation of respondents across the county, although Tiaty East and West were less represented.

Table 11

Gender

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	82	41.6	41.6	41.6
	Male	115	58.4	58.4	100.0
	Total	197	100.0	100.0	

The table shows that of the 197 respondents, 115 (58.4%) were male and 82 (41.6%) were female. The cumulative percentage confirms that males constituted the majority of the respondents. This indicates slightly higher participation among male respondents than among female respondents in the study, which may reflect the gender composition of teachers and educational administrators in the sampled junior public schools. The gender distribution is reasonably balanced, allowing for inclusive representation of perspectives from both male and female respondents.

Table 12

Age Group

Age Group					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	21–25	10	5.1	5.1	5.1
	26–30	26	13.2	13.2	18.3
	31–35	35	17.8	17.8	36.0
	36–40	48	24.4	24.4	60.4
	41–45	31	15.7	15.7	76.1
	46–50	22	11.2	11.2	87.3
	51–55	18	9.1	9.1	96.4
	56+	7	3.6	3.6	100.0
	Total	197	100.0	100.0	

The table presents the age distribution of the 197 respondents. The largest group of respondents was aged 36–40 years, comprising 48 individuals (24.4%). This was followed by those aged 31–35 years (35 respondents, 17.8%) and 41–45 years (31 respondents, 15.7%). Respondents aged 26–30 years accounted for 26 (13.2%), while those aged 46–50 years and 51–55 years comprised 22 (11.2%) and 18 (9.1%), respectively. The smallest groups were 21–25 years (10 respondents, 5.1%) and 56 years and above (7 respondents, 3.6%). The cumulative percentage shows that over 60% of

respondents were aged 31-40, indicating that the majority were in their mid-career stage. This age distribution suggests that the study captured views from relatively experienced teachers and administrators, which could enhance the reliability of insights regarding the implementation of Competency-Based Education (CBE).

Table 13

Highest Qualification

Highest Qualification					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bachelors	82	41.6	41.6	41.6
	Diploma	78	39.6	39.6	81.2
	Masters	29	14.7	14.7	95.9
	Others	8	4.1	4.1	100.0
	Total	197	100.0	100.0	

The table shows that among the 197 respondents, the majority held a Bachelor's degree (82 respondents, 41.6%), followed closely by those with a Diploma (78 respondents, 39.6%). A smaller proportion of respondents held a Master's degree (29 respondents, 14.7%), while only 8 respondents (4.1%) had other qualifications. The cumulative percentage indicates that over 80% of respondents held at least a diploma, suggesting that the sample consisted mainly of well-educated teachers and administrators. This level of academic qualification indicates that respondents likely had the necessary knowledge and professional capacity to provide informed insights into the implementation of Competency-Based Education (CBE).

Table 14

Experience in Years

Experience Years					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<5	58	29.4	29.4	29.4
	11–15	43	21.8	21.8	51.3
	16–20	21	10.7	10.7	61.9
	20+	23	11.7	11.7	73.6
	6–10	52	26.4	26.4	100.0
	Total	197	100.0	100.0	

The table presents the teaching or professional experience of the 197 respondents. The largest group of respondents had less than 5 years of experience (58 respondents, 29.4%), followed by those with 6–10 years of experience (52 respondents, 26.4%). Respondents with 11–15 years of experience comprised 43 (21.8%), those with 20+ years were 23 (11.7%), and those with 16–20 years were 21 (10.7%).

The cumulative percentage indicates that over half of the respondents (51.3%) had between 5 and 15 years of experience, suggesting that a significant proportion were relatively early- to mid-career professionals. This mix of experience levels is beneficial for the study, as it allows insights from both newer and more seasoned teachers regarding the implementation of Competency-Based Education (CBE).

4.2 Descriptive Statistics

4.2.1 Selected Human Resource Management Challenges

The respondents were asked to indicate their level of agreement on selected human resource management challenges facing junior school teachers in the implementation of CBE. The findings are shown in Table 15.

Table 15

Selected Human Resource Management Challenges

Statement	SD	D	N	A	SA	Mean
Frequency	F %	F %	F %	F %	F %	
There are inadequate, qualified teachers trained in the CBE curriculum.	15(8%)	10 (5%)	22(11%)	76 (39%)	74(38%)	4.944
There is resistance to change among junior school teachers regarding the CBE curriculum.	18 (9%)	10 (5%)	25(13%)	76(39%)	68(35%)	4.959
Continuous professional development programs are not provided for junior school teachers.	25 13%)	14 (7%)	13 (7%)	75 (38%)	70(36%)	4.934
Support staff is inadequate for effective CBE implementation.	13 (7%)	21(11%)	30(15%)	80(41%)	53(27%)	4.944
Effective recruitment strategies are not in place for junior school teachers.	25 13%)	20(10%)	24(12%)	58(29%)	70(36%)	4.984
Junior school teachers are not properly inducted for CBE.	20(10%)	22(11%)	30(15%)	68(35%)	57(29%)	4.923
Teachers are not adequately trained in CBE pedagogies.	9 (5%)	24(12%)	26(13%)	79(40%)	59(30%)	4.934
Regular feedback to teachers is not provided for improving the CBE curriculum.	21(11%)	17 (9%)	22(11%)	72(37%)	65(33%)	4.949
There is little communication between teachers and policymakers.	21 11%)	10 (5%)	30(15%)	77(39%)	59(30%)	4.944
Teacher workload is not manageable under CBE.	7 (4%)	25 13%)	21(11%)	55 28%)	89 45%)	4.939

The study examined the human resource management challenges facing junior school teachers in implementing Competency-Based Education (CBE). The findings revealed that 8% of respondents strongly disagreed, 5% disagreed, 11% were neutral, 39% agreed, and 38% strongly agreed that there are inadequately qualified teachers trained in the CBE curriculum. The corresponding mean score was 4.944, indicating a high level of

agreement. This suggests that the majority of teachers believe the number of teachers who have received sufficient CBE training remains low, posing a significant challenge to the effective delivery of the curriculum. The high cumulative percentage of 77% (39% agreed and 38% strongly agreed) demonstrates that the shortage of qualified teachers is a widespread constraint in junior schools. This finding corroborates earlier studies such as those by Ngeno et al. (2021) and Marion (2020), which reported that insufficiently trained teachers are a key bottleneck in implementing the new curriculum. The results imply that without adequate human resource capacity, the CBE reform may struggle to realise its intended learner-centred and skills-oriented outcomes.

Regarding resistance to change among junior school teachers, 9% strongly disagreed, 5% disagreed, 13% were neutral, 39% agreed, and 35% strongly agreed. The mean score of 4.959 indicates strong agreement, suggesting that a considerable proportion of teachers have not fully embraced the new curriculum reforms. The cumulative agreement level of 74% (39% agreed and 35% strongly agreed) demonstrates that teacher resistance is a significant human factor impeding implementation. This resistance could stem from inadequate sensitisation, insufficient training, or fear of the new instructional demands under CBE. These findings are consistent with Koech's (2020) work, which found that attitudinal resistance among teachers is often linked to limited professional preparation and uncertainty about curriculum expectations. Such reluctance to embrace reform creates implementation inconsistencies, slows pedagogical innovation, and reduces teacher morale, ultimately undermining reform effectiveness.

The study also found that 13% strongly disagreed, 7% disagreed, 7% were neutral, 38% agreed, and 36% strongly agreed that continuous professional development programs are not provided for junior school teachers. The mean score of 4.934 indicates strong agreement, suggesting that opportunities for regular skill development are inadequate.

The 74% agreement rate (38% agreed and 36% strongly agreed) underscores the lack of systematic capacity-building initiatives tailored to CBE. This finding aligns with the argument of Waweru and Chepkemboi (2021), who emphasised that ongoing professional development is indispensable for sustaining curricular reforms. The implication here is that without regular professional support, teachers are unable to update their instructional techniques or align assessment strategies with competency-based principles. Consequently, this gap perpetuates reliance on outdated instructional models that do not foster creativity, problem-solving, and collaboration, key competencies envisioned by CBE.

Furthermore, 7% strongly disagreed, 11% disagreed, 15% were neutral, 41% agreed, and 27% strongly agreed that support staffs are inadequate for effective CBE implementation. The mean score of 4.944 also indicates strong agreement, highlighting that many schools face challenges in recruiting and retaining adequate non-teaching personnel, such as laboratory assistants, clerks, and instructional aides, who are vital in supporting CBE-related activities. The 68% cumulative agreement (41% agreed and 27% strongly agreed) implies that teachers are often overburdened with administrative and technical responsibilities that should otherwise be handled by support staff. This finding is consistent with Okello and Bett (2020), who observed that limited non-teaching support undermines the implementation of the curriculum by diverting teachers' attention from instructional to managerial tasks. As a result, teachers experience higher fatigue and reduced instructional efficiency, particularly in practical learning areas central to competency-based approaches.

Regarding recruitment, 13% strongly disagreed, 10% disagreed, 12% were neutral, 29% agreed, and 36% strongly agreed that effective recruitment strategies are not in place for junior school teachers. The mean score of 4.984, the highest among all items, indicates

strong consensus that recruitment policies do not adequately consider CBE-specific competencies. With 65% of respondents (29% agreed and 36% strongly agreed) expressing agreement, the results demonstrate that the recruitment framework does not align with the pedagogical and competency demands of the new curriculum. This finding corroborates studies by Omondi (2022) and Makori (2021), which found that teacher recruitment in Kenya remains largely quantity-oriented rather than competency-driven. The implication is that the recruitment process often prioritises filling vacancies over ensuring that teachers possess the requisite skills to facilitate experiential and inquiry-based learning. This misalignment weakens the instructional foundation necessary for effective CBE delivery.

The findings also revealed that 10% of respondents strongly disagreed, 11% disagreed, 15% were neutral, 35% agreed, and 29% strongly agreed that junior school teachers are not inducted adequately for CBE. The mean score of 4.923 shows strong agreement, suggesting that many teachers begin implementing CBE without adequate orientation or mentorship. The total agreement level of 64% (35% agreed and 29% strongly agreed) indicates a systemic gap in the transition process for teachers moving into the CBE framework. This finding echoes Ngunjiri's (2020) observation that the absence of structured induction programs hinders teachers' internalisation of curriculum goals and assessment standards. Without proper induction, teachers lack confidence and clarity about implementation expectations, leading to uneven application of pedagogical approaches across schools. Consequently, learners may experience disparities in curriculum exposure and competency attainment.

In addition, 5% of respondents strongly disagreed, 12% disagreed, 13% were neutral, 40% agreed, and 30% strongly agreed that teachers are not adequately trained in CBE pedagogies. The mean score of 4.934 indicates strong agreement, suggesting that

teachers lack sufficient mastery of learner-centred and competency-based instructional approaches. The total agreement rate of 70% (40% agreed and 30% strongly agreed) reveals that the pedagogical gap remains one of the most persistent barriers to successful CBE implementation. This finding aligns with Mwangi (2021), who found that limited pedagogical preparedness among teachers directly affects the development of core competencies, such as critical thinking and creativity, among learners. The results imply that while curriculum reforms may be well-intentioned, their success depends heavily on teachers' pedagogical proficiency, which remains inadequate in most junior schools.

Findings further indicated that 11% strongly disagreed, 9% disagreed, 11% were neutral, 37% agreed, and 33% strongly agreed that regular feedback is not provided to teachers to improve the CBE curriculum. The mean score of 4.949 indicates strong agreement, suggesting a lack of systematic evaluation and feedback mechanisms. The cumulative 70% agreement (37% agreed and 33% strongly agreed) reveals that many teachers operate without structured support or performance appraisal linked to CBE implementation. This finding corresponds with Wambugu (2022), who observed that feedback mechanisms are essential for improving teaching practice and ensuring curriculum fidelity. The absence of consistent feedback limits teachers' ability to identify weaknesses, refine instructional methods, and enhance learner performance. This creates a gap between curriculum design and classroom reality, impeding continuous improvement.

The results also showed that 11% of respondents strongly disagreed, 5% disagreed, 15% were neutral, 39% agreed, and 30% strongly agreed that there is little communication between teachers and policymakers. The mean score of 4.944 demonstrates strong agreement, revealing that communication barriers exist between frontline educators and policymakers. The total agreement rate of 69% (39% agreed and 30% strongly agreed)

indicates a disconnect between curriculum developers and implementers. This finding mirrors Ochieng's (2021) conclusion that policy communication in Kenya's education sector is often top-down and fails to integrate teacher perspectives. The implication is that such weak communication may lead to policy misinterpretation, poor coordination, and low ownership of reform initiatives. For CBE to succeed, dialogue between teachers and policymakers must be strengthened through feedback loops and participatory forums.

Finally, regarding workload, 4% strongly disagreed, 13% disagreed, 11% were neutral, 28% agreed, and 45% strongly agreed that teacher workload is not manageable under CBE. The computed mean score of 4.939 indicates strong agreement. The total agreement level of 73% (28% agreed and 45% strongly agreed) suggests that teachers experience increased workloads due to the continuous assessment and individualised instruction required by CBE. This finding supports the work of Cheruiyot (2021), who established that teacher burnout under CBE results from excessive documentation, frequent assessments, and expanded lesson preparation. The results imply that while CBE emphasises holistic learner evaluation, the associated workload threatens teacher productivity and motivation. Over time, this may lead to fatigue and burnout, undermining both instructional quality and the sustainability of curriculum reform.

Overall, the mean scores for all ten statements ranged from 4.923 to 4.984, indicating that respondents strongly agreed that human resource management challenges significantly affect the implementation of CBE in junior schools. The most pronounced issues include ineffective recruitment strategies, lack of continuous professional development, inadequate induction, limited communication between teachers and policymakers, and unmanageable workloads. These findings collectively suggest that successful CBE implementation depends heavily on a robust human resource

management system that supports teacher preparation, motivation, and continuous learning. Addressing these challenges through strategic recruitment, sustained professional development, and improved institutional support would enhance teacher competence, morale, and instructional effectiveness, thereby improving the overall success of Competency-Based Education in Kenya's junior schools.

The findings align with those of Mugabo et al. (2021) and Nsengimana (2020)**,** who reported that continuous teacher training and adequate instructional resources are prerequisites for the successful implementation of Competency-Based Education (CBE). In the current study, a majority of teachers agreed that there are inadequate numbers of qualified teachers trained in CBE (mean = 4.944), that continuous professional development programs are not provided (mean = 4.934), and that induction is inadequate (mean = 4.923). These findings also align with Momanyi and Rop (2019) and Sitenei (2020)**,** who found that teachers lacked sufficient in-service training and understanding of new pedagogies required under CBE, leading to low preparedness levels in teaching and assessment. Similarly, Mustafa (2023**)** emphasised the importance of investing in teacher education programs and appropriate assessment systems, supporting the current observation that teachers are not adequately equipped with CBE pedagogical skills (mean 4.934).

Furthermore, Akala (2021) argued that Kenya's Competency-Based Education was rolled out hastily, without sufficient teacher preparation or stakeholder engagement, findings that align with this study's finding that most teachers began implementing CBE without proper induction or orientation. These consistencies across studies suggest that inadequate training, poor induction, and limited professional development remain significant human resource management challenges in CBE implementation,

underscoring the need for structured, continuous capacity-building initiatives to enhance teacher competence and curriculum fidelity.

The study established a high level of convergence between the quantitative and qualitative findings regarding the human resource management challenges facing junior school teachers in implementing the Competency-Based Education. The quantitative data revealed strong agreement among respondents across all items, indicating that the constraints identified are not isolated but systemically entrenched within the educational structure. The qualitative data from principals and sub-county directors provided contextual depth, illustrating how these challenges manifest in everyday school operations and affect the fidelity of CBE implementation.

Teachers consistently expressed that the number of qualified personnel trained in CBE remains insufficient. This concern was echoed by principals, who reported that the scarcity of teachers with adequate CBE pedagogical training compels schools to rely on staff who often revert to traditional content delivery. This undermines the core intent of CBE, which emphasizes the development of competencies such as critical thinking, collaboration, and creativity. Sub-county directors reinforced this observation, noting that the lack of adequately trained teachers has produced inconsistencies in lesson delivery and learner outcomes. The combined findings indicate that the challenge is not merely numerical but reflects a deeper skills mismatch between the curriculum's pedagogical demands and the professional capacity of existing teachers.

The shortage of support staff also emerged as a significant impediment to effective CBE delivery. Principals described that in the absence of adequate clerical, technical, and laboratory support, teachers are forced to take on non-instructional responsibilities such as record management, inventory control, and classroom maintenance. This encroaches upon time meant for lesson planning, individualised learning, and formative assessment.

Sub-county directors confirmed that the overstretching of support services undermines operational efficiency and the quality of instruction. These findings demonstrate that successful curriculum reform depends on holistic staffing policies that recognise the integral role of non-teaching personnel in supporting the teaching-learning process.

Both teachers and administrators agreed that weak communication between classroom practitioners and policymakers creates a persistent disconnect in CBE implementation. Principals described this gap as a major source of policy distortion, where teachers receive directives without adequate contextualization or feedback mechanisms. Similarly, sub-county directors observed that teachers often feel alienated from decision-making processes, which diminishes their sense of ownership and accountability. The convergence of perspectives points to the absence of a structured feedback loop that would enable continuous learning between schools and education authorities. Effective reform, therefore, requires reciprocal communication systems that translate policy into actionable classroom strategies and channel field experiences back to policymakers.

The issue of inadequate pedagogical training further complicates implementation. Principals reported that many teachers lack mastery of learner-centred and inquiry-based instructional approaches, leading to superficial curriculum coverage rather than deep competency acquisition. Lesson delivery remains largely teacher-directed, and assessment practices continue to prioritise memorisation over authentic demonstrations of understanding. Sub-county directors added that this pedagogical gap weakens learners' creativity and critical thinking. These findings collectively reveal a systemic disconnect between the CBE’s constructivist orientation and prevailing instructional practices, underscoring the need for sustained professional retraining anchored in classroom-based coaching and peer learning models.

A recurrent theme across both data strands was the lack of regular, constructive feedback to teachers. Principals explained that feedback mechanisms are often irregular, punitive, or administrative, rather than developmental. This deprives teachers of opportunities for reflective practice and professional growth. Sub-county directors emphasised that the absence of structured feedback impedes early correction of instructional errors, leading to persistent delivery gaps. Analytically, this suggests that current evaluation systems are insufficiently formative, weakening both teacher learning and curriculum responsiveness. Establishing supportive, evidence-based feedback structures would therefore be essential for continuous improvement in CBE implementation.

The absence of continuous professional development opportunities emerged as another major barrier. Principals highlighted that most professional development initiatives are sporadic workshops lacking follow-up or mentoring components. At the same time, sub-county directors noted that teachers often rely on outdated teaching methods incompatible with CBE expectations. The combined data suggest that sustainable curriculum reform requires continuous professional learning embedded within school systems, linked to teacher appraisal, accreditation, and career progression. Such structures would promote pedagogical renewal and institutionalise innovation within the teaching profession.

Teachers also reported excessive workloads associated with CBE. Principals observed that continuous assessment, individualised instruction, and extensive parental engagement have significantly increased administrative and pedagogical burdens, contributing to fatigue and reduced motivation. Sub-county directors similarly pointed out that the pressure of workload limits time for creative lesson design and reflective practice. The findings collectively reveal that the current implementation framework underestimates the labour intensity of competency-based instruction, necessitating a

review of class sizes, administrative delegation, and workload redistribution to sustain teacher wellbeing and performance.

Resistance to change was another recurrent challenge. Principals attributed this resistance to fear of new demands, lack of confidence in CBE-related skills, and skepticism about the reform's practicality. Some teachers reportedly adopt CBE vocabulary without transforming their instructional practices, resulting in superficial compliance. Sub-county directors supported this view, explaining that reluctance to embrace change stems from inadequate preparation and minimal participation in policy design. The combined interpretation indicates that resistance is not purely psychological but structural, reflecting a broader failure to manage change through trust-building, participatory engagement, and demonstrable evidence of CBE's effectiveness.

Recruitment practices were also found to be misaligned with CBE requirements. Principals and sub-county directors agreed that current recruitment processes fail to assess candidates' competencies in relation to CBE pedagogies, leading to inappropriate placements and persistent subject shortages. These weaknesses disrupt instructional continuity and reduce the system's capacity to deliver on CBE objectives. The synthesis of findings points to a need for competency-based recruitment frameworks that emphasise subject expertise, digital literacy, and learner-centred instructional skills.

Finally, poor induction processes for newly appointed teachers were highlighted as a continuing gap. Principals observed that new teachers often enter classrooms without adequate orientation to CBE philosophy, assessment methods, or record-keeping standards, leading to confusion and inconsistent practice. Sub-county directors confirmed that this lack of systematic induction prolongs the adaptation period and undermines curriculum consistency. Analytically, induction emerges as a critical but underdeveloped

process that should be institutionalised to support new teachers' integration into CBE pedagogy and culture.

Overall, the integration of quantitative and qualitative findings demonstrates strong convergence in identifying human resource management challenges as core determinants of CBE implementation success. The quantitative results established the prevalence of these challenges, while the qualitative data provided interpretive depth by revealing how they interact and manifest at the operational level. Together, the findings portray a systemic human resource capacity gap that transcends individual teacher deficits and points instead to institutional weaknesses in recruitment, training, communication, and professional support. The analysis, therefore, underscores that achieving fidelity in CBE implementation requires not only pedagogical reform but also structural transformation in human resource management practices, policy coherence, and leadership accountability across the education sector.

4.4.2 Selected Physical Resource Management Challenges

The respondents were asked to indicate their level of agreement with selected physical resource management challenges in junior schools regarding CBE implementation. The findings are shown in Table 16.

Table 16

Selected Physical Resource Management Challenges

Statement	SD	D	N	A	SA	Mean
Frequency	F %	F %	F %	F %	F %	
There are inadequate classrooms for CBE in junior schools.	24(12%)	30(15%)	17 (9%)	51(26%)	75(38%)	4.949
There are a few laboratories to support CBE activities.	20(10%)	12 (6%)	23(12%)	59(30%)	83(42%)	4.908
There are no libraries available for CBE in junior schools.	17 (9%)	21(11%)	19(10%)	78 (40%)	62(31%)	4.898
Textbooks for CBE are insufficient.	23 (12%)	10 (5%)	28(14%)	59 (30%)	77(39%)	4.939
Teaching aids for CBE are inadequate.	8 (4%)	15 (8%)	17 (9%)	75(38%)	82(42%)	4.959
Desks for CBE are inadequate.	15 (8%)	26(13%)	22(11%)	70 (36%)	64(32%)	4.939
There is insufficient playground space for CBE's practical learning activities.	7 (4%)	14 (7%)	13 (7%)	64 (32%)	99(50%)	4.934
Chairs for CBE are inadequate.	15 (8%)	19(10%)	10 (5%)	78 (40%)	75(38%)	4.934
Electricity connectivity for CBE is lacking.	9 (5%)	12 (6%)	24 12%)	59 (30%)	93(47%)	4.949

The study also examined physical resource management challenges in junior schools with respect to the implementation of Competency-Based Education (CBE). The findings revealed that 12% of respondents strongly disagreed, 15% disagreed, 9% were neutral, 26% agreed, and 38% strongly agreed that there are inadequate classrooms for CBE in junior schools. The corresponding mean score was 4.949, indicating a high level of agreement. This suggests that the majority of respondents believed classroom shortages significantly hinder the smooth implementation of CBE, forcing schools to operate in

congested, resource-limited environments. The cumulative agreement of 64% (26% agreed and 38% strongly agreed) indicates that infrastructural inadequacy remains a foremost challenge in ensuring effective learning under CBE. This finding corroborates the observations of Ngeno et al. (2021) and Chepkemboi (2020), who emphasised that inadequate classrooms constrain the learner-centred methodologies central to CBE by limiting space for group work, differentiated instruction, and project-based learning. The implication is that overcrowded classrooms reduce teacher-student interaction and impede the implementation of formative assessment practices essential to the curriculum.

Regarding laboratory facilities, 10% of respondents strongly disagreed, 6% disagreed, 12% were neutral, 30% agreed, and 42% strongly agreed that there are few laboratories to support CBE activities. The mean score of 4.908 indicates strong agreement, suggesting that limited access to well-equipped laboratories restricts learners' opportunities for hands-on experience, a central component of CBE's competency-based approach. With a total agreement of 72% (30% agreed and 42% strongly agreed), these findings highlight a critical gap in the provision of practical learning facilities. This finding is consistent with Marion (2020), who reported that inadequate science laboratories undermine the practical orientation of CBE, especially in the teaching of science and technology subjects. The results imply that without well-equipped laboratories, learners are denied authentic opportunities to demonstrate and apply skills, contrary to the experiential learning principles embedded in CBE.

The study also found that 9% of respondents strongly disagreed, 11% disagreed, 10% were neutral, 40% agreed, and 31% strongly agreed that there are no libraries available for CBE in junior schools. The mean score of 4.898 signifies a high level of agreement, suggesting that the absence of libraries deprives learners and teachers of access to essential reference materials needed to support research and independent learning under

the CBE system. The total agreement rate of 71% (40% agreed and 31% strongly agreed) indicates that the lack of library facilities remains a systemic issue in many junior schools. This finding echoes Mwangi's (2021) argument that libraries are crucial for nurturing inquiry-based learning, reading culture, and independent study, core elements of CBE. The results, therefore, suggest that, without access to library resources, both teachers and learners rely heavily on limited textbooks, thereby reducing opportunities for creativity, self-directed learning, and exploration.

Furthermore, 12% strongly disagreed, 5% disagreed, 14% were neutral, 30% agreed, and 39% strongly agreed that textbooks for CBE are insufficient. The computed mean score of 4.939 indicates strong agreement. This finding implies that the shortage of CBE textbooks remains a major instructional challenge, limiting both teachers' and learners' ability to implement curriculum objectives effectively. The 69% agreement rate (30% agreed and 39% strongly agreed) indicates the persistence of material scarcity despite government efforts to provide learning resources. Similar findings were reported by Odhiambo and Waweru (2020), who noted that shortages in subject-specific CBE materials hinder lesson delivery and assessment. The implication is that inadequate textbooks not only constrain instructional coverage but also force teachers to improvise or rely on outdated materials, undermining curriculum fidelity.

Regarding teaching aids, 4% strongly disagreed, 8% disagreed, 9% were neutral, 38% agreed, and 42% strongly agreed that teaching aids for CBE are inadequate. The mean score of 4.959, the highest among all items, indicates robust agreement. This suggests that most schools lack sufficient instructional materials and learning aids, such as charts, models, and digital tools, essential for interactive, practical learning under CBE. The total agreement level of 80% (38% agreed and 42% strongly agreed) is particularly striking, revealing that the unavailability of teaching aids remains a pervasive challenge.

These results are consistent with Cheruiyot (2021), who argued that effective implementation of CBE relies heavily on learner engagement through visual and tactile teaching materials. The findings, therefore, imply that the inadequacy of teaching aids diminishes learner participation, limits experiential learning, and reduces instructional effectiveness.

The results also revealed that 8% of respondents strongly disagreed, 13% disagreed, 11% were neutral, 36% agreed, and 32% strongly agreed that desks for CBE are inadequate. The mean score of 4.939 indicates strong agreement, suggesting that insufficient classroom furniture contributes to congestion and discomfort, thereby negatively affecting learners' participation and concentration. The 68% cumulative agreement (36% agreed and 32% strongly agreed) highlights those physical learning environments remain largely unconducive to participatory instruction. This finding aligns with Gichure's (2022) conclusion that inadequate furniture adversely affects posture, attention, and learner collaboration in CBE classrooms. The results suggest that physical discomfort and overcrowding not only lower motivation but also impede the continuous formative assessment required under CBE.

In terms of learning spaces, 4% of respondents strongly disagreed, 7% disagreed, 7% were neutral, 32% agreed, and 50% strongly agreed that there are no insufficient playgrounds for CBE's practical learning activities. The mean score of 4.934 indicates a high level of agreement, suggesting that the lack of playgrounds limits opportunities for physical education, co-curricular engagements, and experiential learning—key components of the CBE framework. The 82% agreement rate (32% agreed and 50% strongly agreed) underscores the magnitude of this challenge. This finding aligns with Ouma (2020), who asserted that experiential learning spaces, including playgrounds and open activity areas, are indispensable for holistic learner development under CBE. The

results imply that inadequate outdoor facilities restrict the implementation of integrated learning areas such as sports, environmental studies, and creative arts.

The findings further revealed that 8% of respondents strongly disagreed, 10% disagreed, 5% were neutral, 40% agreed, and 38% strongly agreed that chairs for CBE are inadequate. The mean score of 4.934 demonstrates strong agreement, highlighting that inadequate classroom furniture remains a persistent issue that undermines learners' comfort and the creation of conducive learning environments. The combined agreement of 78% (40% agreed and 38% strongly agreed) reinforces the conclusion that infrastructure deficits continue to compromise the quality of the learning environment. This observation supports the findings of Kimeu (2021), who noted that ergonomic, well-arranged classrooms are crucial for enabling the interactive and collaborative learning demanded by CBE. The implication is that insufficient chairs limit mobility, group work, and flexible learning arrangements, which are critical to competency-based pedagogy.

Finally, regarding power supply, 5% strongly disagreed, 6% disagreed, 12% were neutral, 30% agreed, and 47% strongly agreed that electricity connectivity for CBE is lacking. The mean score of 4.949 indicates strong agreement, suggesting that inadequate electricity access is a significant obstacle to the integration of ICT tools and digital learning resources envisioned under CBE. The cumulative 77% agreement (30% agreed and 47% strongly agreed) demonstrates that unreliable power supply restricts the use of digital content, multimedia resources, and e-learning platforms. This finding is consistent with Muthiani (2022), who observed that the digital component of CBE has been constrained by limited electricity and internet connectivity, especially in rural schools. The results imply that the digital divide continues to impede the equitable

implementation of CBE across schools, particularly in schools with weak technological infrastructure.

Overall, the mean scores for all nine statements ranged between 4.898 and 4.959, reflecting a consensus that physical resource shortages, particularly in classrooms, laboratories, libraries, textbooks, teaching aids, furniture, playgrounds, and electricity, pose serious challenges to CBE implementation. The consistently high mean values across all items indicate widespread agreement among respondents that inadequate physical infrastructure undermines the learner-centered, practical orientation of CBE. These findings underscore the need for increased investment in school infrastructure and learning facilities to ensure that CBE's transformative educational goals are effectively realised in Kenya's junior schools. In particular, strengthening resource allocation, expanding school infrastructure, and ensuring equitable distribution of materials would enhance both the quality and inclusivity of CBE implementation across the country.

The findings agree with World Bank (2021) and Sossion (2019), who emphasised that adequate school infrastructure, including classrooms, laboratories, and libraries, is essential for effective learning and the successful implementation of competency-based education. In the present study, a majority of respondents agreed that classrooms in junior schools are inadequate (mean = 4.949), leading to congestion and limited learning space. This aligns with Sossion's argument that large class sizes undermine individualised and participatory learning as envisioned under CBE. The shortage of laboratories (mean = 4.908) and libraries (mean = 4.898) observed in this study also supports Hawa's (2018) claim that well-equipped physical environments enhance learner engagement and motivation. The consistent findings suggest that infrastructure gaps remain a key impediment to the realisation of the hands-on, research-oriented learning outcomes central to CBE.

The findings also align with Nazimana (2021), who identified severe infrastructural deficiencies including inadequate classrooms, science laboratories, and ICT facilitiesas major challenges to the implementation of Competency-Based Education in Ugandan secondary schools. Similarly, the strong agreement in this study that CBE textbooks are insufficient (mean = 4.939) and that teaching aids are inadequate (mean = 4.959) corroborates the observations of Mucheni (2021), who reported that despite curriculum materials being published in Kenya, the quality and quantity were not sufficient to support effective CBE teaching. Likewise, Dusabimana and Mugabo et al. (2022) found that inadequate physical resources hindered teachers' ability to conduct inquiry-based, competency-oriented instruction in Rwanda. The present study's findings therefore reinforce the conclusion that resource inadequacy, especially in laboratories, libraries, and instructional materials, limits teachers' capacity to facilitate experiential learning, the hallmark of CBE.

The findings further agree with Mwita and Onyango (2022) and Kathuni et al. (2023), who established a strong positive relationship between the availability of physical resources and the success of CBE implementation in Kenyan schools. In the current study, respondents strongly agreed that desks (mean = 4.939), chairs (mean = 4.934), and playgrounds (mean = 4.934) are inadequate. These results echo the conclusion by Kathuni et al. (2023) that inadequacies in physical facilities directly and negatively influence the achievement of curriculum outcomes. Similarly, Ng'eno et al. (2021) found that physical infrastructure had a significant positive effect on CBE implementation. However, specialised rooms such as laboratories and music studios remained limited, findings that mirror the shortages highlighted in this study. Collectively, these studies confirm that the adequacy and quality of physical facilities directly determine the

effectiveness of CBE delivery, particularly in supporting collaborative, practical, and performance-based learning.

The findings revealed a strong consensus among respondents that inadequate physical resources significantly constrain the implementation of Competency-Based Education (CBE) in junior schools. The quantitative results demonstrated high mean scores across all indicators, showing that shortages in classrooms, laboratories, libraries, textbooks, teaching aids, furniture, playgrounds, and electricity are pervasive. The qualitative insights from principals and sub-county directors reinforced these statistical patterns by illuminating the lived realities of resource scarcity in schools and its direct consequences on teaching, learning, and curriculum fidelity.

Inadequate classrooms emerged as one of the most critical physical constraints. Both principals and sub-county directors described overcrowding as a systemic issue that undermines learner-centred pedagogy, which is the cornerstone of CBE. With too many learners per class, teachers often revert to traditional lecture methods rather than inquiry-based learning. The resultant congestion impedes movement, group work, and differentiated instruction, limiting opportunities for personalised learning and formative assessment. Principals reported that some schools have resorted to shift systems or multi-grade teaching to manage congestion, which compromises instructional continuity and time-on-task. Sub-county directors added that overcrowded classrooms also pose health and safety risks and diminish learner engagement. Collectively, these findings suggest that classroom shortages are not merely infrastructural but pedagogical impediments that distort the very philosophy of competency-based education.

The absence of functional libraries was also identified as a significant bottleneck. Principals emphasised that without access to libraries, learners are deprived of opportunities for independent reading, research, and exposure to diverse texts, key

elements for nurturing creativity, critical thinking, and problem-solving skills under CBE. Teachers, too, lack access to supplementary instructional materials that could enrich lessons and encourage resource-based learning. Sub-county directors echoed these sentiments, noting that in most schools, the absence of libraries confines learning to teacher notes and textbooks, leading to a narrow interpretation of curriculum content. The combined evidence underscores that libraries are not peripheral amenities but central learning environments that operationalise CBE's constructivist approach.

Similarly, the scarcity of CBE-aligned textbooks emerged as a recurring challenge. The quantitative data showed widespread agreement that textbook insufficiency limits the quality of instruction. Principals explained that the few available copies are shared among many learners, restricting individual reading and comprehension. This has forced teachers to rely heavily on oral instruction and note-taking, undermining learner autonomy and the development of study habits. Sub-county directors observed that textbook scarcity exacerbates inequalities, as only students from well-off families can afford supplementary materials. The implication is that resource inequality translates directly into learning inequality, contradicting CBE's goal of inclusive education.

The inadequacy of teaching aids was highlighted as another critical obstacle. Principals lamented that the absence of charts, models, manipulatives, and ICT materials has reduced learning to abstract theoretical discussions rather than experiential engagement. Since CBE emphasises demonstration, simulation, and practical application, the lack of teaching aids undermines learners' ability to translate knowledge into skills. Sub-county directors confirmed that most teachers are constrained to chalk-and-talk approaches because of insufficient instructional materials, leading to diminished learner curiosity and creativity. These findings underscore that resource inadequacy not only limits access to materials but also suppresses pedagogical innovation.

Furniture shortages, especially desks and chairs, were consistently cited as impediments to effective CBE implementation. The quantitative data reflected strong agreement that the scarcity of desks and chairs compromises learner comfort and classroom organisation. Principals reported that in some schools, learners share desks in threes or sit on the floor, creating discomfort and fatigue that lowers concentration and participation. Sub-county directors added that such conditions also breed indiscipline and health risks, particularly in overcrowded settings. The analytical interpretation suggests that adequate seating is not a trivial matter but an enabling condition for collaborative learning, group work, and assessment activities that define CBE pedagogy.

Equally important was the finding on inadequate playgrounds. Both principals and sub-county directors linked this deficiency to the marginalisation of physical education and co-curricular activities, which are integral to CBE's holistic approach. Without adequate playgrounds, learners are denied opportunities to develop social, psychomotor, and teamwork skills. Principals highlighted that where playgrounds exist, they are often overcrowded or unsafe, limiting experiential learning. Sub-county directors noted that this results in an overly academic implementation of CBE, neglecting non-academic competencies such as physical fitness, cooperation, and creativity. These insights reveal that CBE's vision of holistic education cannot be realised without proportional investment in outdoor learning infrastructure.

The lack of laboratory facilities was another pressing issue affecting practical learning in science and technology. Principals reported that without equipped laboratories, learners cannot conduct experiments or engage in problem-solving tasks that build applied knowledge. Teachers, therefore, deliver theory-heavy lessons that contradict CBE's focus on hands-on skills. Sub-county directors supported this observation, emphasising that the deficiency of laboratories limits learners' preparedness for higher-level STEM

studies and careers. The analytical implication is that inadequate laboratories perpetuate theoretical learning at the expense of competence-based mastery, particularly in science subjects.

Electricity connectivity emerged as a foundational challenge for digital integration in CBE. The quantitative data showed strong agreement that many schools lack reliable electricity, while qualitative accounts from principals and sub-county directors confirmed its broad implications. Principals described that without electricity, schools cannot operate ICT labs, run projectors, or access digital learning materials. Sub-county directors emphasised that the absence of power not only excludes learners from digital literacy but also disrupts administrative functions such as electronic record-keeping and assessment. Even in schools connected to the grid, frequent power outages without backup systems render ICT integration inconsistent and unreliable. These findings reveal that electricity access is both an infrastructural and pedagogical requirement for 21st-century learning envisioned under CBE.

The integration of quantitative and qualitative findings, therefore, points to a pervasive structural deficit in physical resource provision that undermines CBE implementation at multiple levels: pedagogical, administrative, and experiential. While the quantitative data establish the prevalence and severity of resource shortages, the qualitative evidence from principals and sub-county directors explains their more profound implications for learning processes and outcomes. The overall analysis reveals that resource inadequacy not only constrains curriculum delivery but also erodes teacher motivation, learner engagement, and the authenticity of competency development.

Ultimately, the findings show that effective CBE implementation is inseparable from investment in physical infrastructure. Classrooms, libraries, laboratories, teaching aids, furniture, and electricity constitute the enabling ecosystem for learner-centred pedagogy.

Without addressing these resource gaps, the CBE risks being reduced to a policy ideal rather than a lived educational reality. The analysis thus underscores the need for a comprehensive resource mobilisation framework that integrates state funding, community participation, and public-private partnerships to ensure equitable access to adequate physical learning environments across all junior schools.

4.4.3 Selected ICT Resource Management Challenges

The respondents were asked to indicate their level of agreement with selected ICT resource management challenges in junior schools regarding CBE implementation. The findings are shown in Table 17.

Table 17

Selected ICT Resource Management Challenges

Statement	SD	D	N	A	SA	Mean
Frequency	F %	F %	F %	F %	F %	
Internet connectivity for CBE is inadequate.	10 (5%)	24(12%)	25(13%)	72 (37%)	66 (34%)	4.857
Laptops for CBE lessons are lacking.	11 (6%)	25(13%)	23(12%)	50 (25%)	88 (45%)	4.949
Projectors for CBE lessons are lacking.	15 (8%)	26(13%)	30(15%)	76 (39%)	50 (25%)	4.954
Cameras for CBE students are inadequate.	8 (4%)	29(15%)	23(12%)	66 (34%)	71 (36%)	4.979
Technical support for maintaining school devices is lacking.	25(13%)	11 (6%)	21(11%)	57 (29%)	83 (42%)	4.944
Teachers are not provided with adequate training on integrating ICT in CBE teaching.	11 (6%)	29(15%)	22(11%)	61 (31%)	74 (38%)	4.954
There is no reliable system in place for repairing and maintaining ICT resources.	5 (3%)	24(12%)	11 (6%)	78 (40%)	79 (40%)	4.918
Desktops for CBE students are inadequate.	13 (7%)	27(14%)	28(14%)	72 (37%)	57 (29%)	4.974
Smartphones for CBE students are lacking.	9 (5%)	26(13%)	23(12%)	63 (32%)	76 (39%)	4.944
Tablets for CBE students are inadequate.	9 (5%)	12 (6%)	28(14%)	68 (35%)	80 (41%)	4.969
iPads for CBE students are lacking.	8 (4%)	22(11%)	13 (7%)	74 (38%)	80 (41%)	4.949

The analysis of ICT resource management challenges in the implementation of Competency-Based Education (CBE) in junior schools revealed a range of deficiencies that significantly undermine the curriculum's technology-oriented goals. The findings showed that 5% strongly disagreed, 12% disagreed, 13% were neutral, 37% agreed, and 34% strongly agreed that internet connectivity for CBE is inadequate, yielding a mean score of 4.857. This high mean indicates substantial agreement among respondents that

poor internet connectivity remains a critical obstacle to the realisation of CBE objectives. Limited internet access restricts learners' and teachers' ability to conduct online research, participate in digital collaboration, and access e-learning platforms that support self-paced and inquiry-driven learning. This finding corroborates previous studies such as those by Mugo (2021) and Nyamai (2022), which established that inadequate internet infrastructure in public schools, constrains digital learning and impedes the integration of technology into the Kenyan education system. These results imply that achieving CBE's vision of interactive, learner-centred education depends heavily on improved digital infrastructure and affordable internet access in schools.

Regarding the availability of laptops, the findings indicated that 6% of respondents strongly disagreed, 13% disagreed, 12% were neutral, 25% agreed, and 45% strongly agreed that laptops for CBE lessons are lacking, yielding a mean score of 4.949. The high level of agreement underscores a serious shortfall in the availability of essential digital devices needed for instruction. The scarcity of laptops curtails the development of digital literacy, limits access to digital instructional resources, and hinders teachers and learners from effectively engaging with technology-driven pedagogies. These findings align with Waweru (2020), who observed that most Kenyan junior schools still rely on shared or outdated devices, thereby undermining technology integration in the classroom. Consequently, this deficiency limits CBE's potential to foster digital competence and innovation among learners, a key pillar of the curriculum reform.

Similarly, 8% strongly disagreed, 13% disagreed, 15% were neutral, 39% agreed, and 25% strongly agreed that projectors for CBE lessons are lacking, yielding a mean score of 4.954. This high level of agreement suggests that the absence of projectors diminishes teachers' ability to employ multimedia instructional techniques, such as visual simulations, videos, and interactive presentations, that enhance learner engagement.

These findings imply that the effective implementation of CBE requires not only digital literacy among teachers but also access to visual and technological teaching aids that make learning more experiential and participatory. Comparable conclusions were drawn by Omondi (2021), who emphasised that inadequate multimedia resources constrain creative lesson delivery and reduce learners' motivation to participate in classroom activities.

The findings also revealed that 4% strongly disagreed, 15% disagreed, 12% were neutral, 34% agreed, and 36% strongly agreed that cameras for CBE students are inadequate, with a mean score of 4.979—the highest among ICT indicators. This reflects a strong consensus that the absence of cameras limits students' opportunities for practical and creative learning, such as documentation of fieldwork, science projects, and art activities. Since CBE emphasizes innovation and the demonstration of skills through practical evidence, the lack of such visual recording tools compromises its experiential learning component. This finding is consistent with studies by Mugo and Wanjiru (2022), who noted that a deficiency in audiovisual tools limits learners' capacity for self-expression and reflective learning—two key competencies targeted under the CBE framework.

Furthermore, the study found that 13% of respondents strongly disagreed, 6% disagreed, 11% were neutral, 29% agreed, and 42% strongly agreed that technical support for maintaining school devices is lacking, giving a mean score of 4.944. This finding points to a systemic problem in sustaining ICT infrastructure in schools. The absence of qualified technical personnel means that broken or malfunctioning devices remain unrepaired, leading to frequent disruptions in ICT-based lessons. This situation mirrors the findings of Mwangi (2021), who reported that the lack of school-based ICT technicians reduces the lifespan of digital equipment and increases maintenance costs.

These results imply that sustainable integration of ICT in CBE must go beyond hardware acquisition to include institutional capacity for technical support and maintenance.

Regarding teacher training in ICT integration, 6% of respondents strongly disagreed, 15% disagreed, 11% were neutral, 31% agreed, and 38% strongly agreed that teachers are not provided with adequate training on integrating ICT into CBE teaching, yielding a mean score of 4.954. This reflects a widespread inadequacy in teacher preparedness to apply digital tools in lesson planning, instruction, and assessment. Without proper training, teachers are less likely to use ICT effectively to facilitate competency-based learning. This finding corroborates earlier studies by Ouma (2020) and UNESCO (2021), which revealed that teacher digital skills remain low in many African education systems despite significant investments in ICT infrastructure. These results imply that teacher capacity-building in ICT integration must be institutionalized within continuous professional development programs to enhance CBE's technological orientation.

The study further found that 3% of respondents strongly disagreed, 12% disagreed, 6% were neutral, 40% agreed, and 40% strongly agreed that there is no reliable system for repairing and maintaining ICT resources, with a mean score of 4.918. This indicates that the absence of a structured maintenance policy contributes to the deterioration of existing ICT equipment. When resources break down without repair, schools are forced to revert to traditional teaching methods, negating progress toward digital transformation. This finding supports Mutua (2021), who noted that the lack of sustainable ICT management frameworks in Kenyan schools results in resource waste and inefficient technology utilization.

Regarding digital learning devices, 7% strongly disagreed, 14% disagreed, 14% were neutral, 37% agreed, and 29% strongly agreed that desktops for CBE students are inadequate, yielding a mean score of 4.974. The high level of agreement highlights that

insufficient access to desktop computers constrains students' ability to develop practical ICT skills. Similarly, 5% of respondents strongly disagreed, 13% disagreed, 12% were neutral, 32% agreed, and 39% strongly agreed that smartphones for CBE students are lacking, resulting in a mean of 4.944. This indicates that the absence of mobile learning tools limits students' exposure to educational applications and online platforms that promote continuous learning. These results reinforce the notion that CBE's technology-driven objectives cannot be realized without ensuring equitable access to digital tools at the learner level.

Finally, 5% of respondents strongly disagreed, 6% disagreed, 14% were neutral, 35% agreed, and 41% strongly agreed that tablets for CBE students are inadequate, with a mean score of 4.969. Additionally, 4% strongly disagreed, 11% disagreed, 7% were neutral, 38% agreed, and 41% strongly agreed that iPads for CBE students are lacking, resulting in a mean of 4.949. These findings further emphasize the pervasive shortage of essential ICT devices across schools. Without tablets and iPads, teachers cannot deliver interactive e-learning content, and learners cannot access digital materials necessary for individualized and competency-based instruction.

Overall, the mean scores across all ICT-related indicators ranged between 4.857 and 4.979, reflecting overwhelming consensus among respondents that ICT resource inadequacies severely constrain the effective implementation of CBE in junior schools. The most critical challenges identified include limited internet connectivity, a shortage of digital devices, a lack of technical maintenance systems, and inadequate teacher training in ICT integration. These results align with national reports such as the Ministry of Education's ICT in Education Policy (2020), which noted persistent infrastructure gaps in public schools. The findings imply that addressing these challenges through increased

investment in digital infrastructure, teacher training, and maintenance support will be essential for realizing the transformative potential of CBE in Kenya's education system.

The findings align with Murithi and Yoo (2021), who reported a mismatch between the perceived importance of ICT in promoting educational goals and the actual availability of ICT resources in schools. In the present study, respondents strongly agreed that laptops (mean = 4.949), desktops (mean = 4.974), tablets (mean = 4.969), and iPads (mean = 4.949) are largely inadequate for effective CBE delivery. These findings imply that most junior schools lack the essential digital devices needed to integrate technology into instruction. This situation reflects Murithi and Yoo's observation that teachers' limited access to digital tools constrains pedagogical innovation and technology-supported learning. Similarly, Omboto et al. (2022) reported that, despite Kenya's Digital Literacy Programme, ICT resources were either underutilized or unavailable in some schools, particularly those serving students with special needs. The alignment of these results suggests that the scarcity of ICT devices remains a systemic challenge across Kenyan schools, impeding the attainment of digital literacy and technology-enhanced teaching envisioned under CBE.

The findings also agree with Fabito et al. (2022)**,** who highlighted that inadequate internet connectivity and poor preparedness of both students and teachers were significant barriers to online and technology-driven learning in the Philippines during the COVID-19 pandemic. In this study, 71% of respondents agreed or strongly agreed that internet connectivity for CBE is inadequate, with a mean of 4.857. This finding also aligns with Mulenga and Kabombwe (2019), who noted that in Zambia, teachers relied on cybercafés for internet access due to insufficient school connectivity, thereby compromising the confidentiality and timeliness of assessment materials. Similarly, Yildirim and Sensoy (2018) found disparities in technological access among low-income

schools, resulting in unequal opportunities for technology-based learning. These parallels indicate that inadequate connectivity is not unique to Baringo County but represents a regional constraint across Sub-Saharan Africa. The implications are significant: limited internet access prevents teachers and students from using online learning platforms, accessing educational materials, and participating in collaborative digital projects, which are central to CBE pedagogy.

The findings further agree with Van Wyk (2021**)**, who observed that teachers' confidence, competence, and access to resources are vital determinants for integrating digital technology into learning environments. The current study established that a majority of respondents agreed that teachers are not provided with adequate training on ICT integration in CBE teaching (mean = 4.954). This finding confirms Van Wyk's conclusion that teacher readiness, including technical competence and self-efficacy, is a prerequisite for effective ICT integration. Similarly, Isaboke et al. (2021**)** found those lower-primary teachers' attitudes, training background, and self-efficacy significantly influenced their readiness to use ICT in instruction. The consistent findings underscore that limited ICT training undermines teachers' ability to incorporate technology into their lessons, resulting in reduced learner engagement and ineffective implementation of technology-based competencies within CBE. These outcomes highlight the importance of continuous digital literacy training and mentorship for teachers to build their confidence and skills in ICT integration.

The qualitative analysis of interviews with principals and sub-county directors provides deeper insights into the practical implications of ICT resource management challenges affecting the implementation of the Competency-Based Education (CBE) in junior schools. From the principals' perspectives, inadequate internet connectivity was identified as one of the most significant barriers to effective CBE delivery. Poor or

absent connectivity severely limited access to online teaching resources, digital curriculum support documents, and e-learning platforms. Teachers were unable to download instructional materials or engage in virtual professional development, while learners were deprived of opportunities for online research, collaboration, and digital exploration. This digital isolation undermines one of CBE's core objectives, cultivating inquiry-based learning and technological competence among students.

Similarly, the shortage of laptops was consistently cited as a critical impediment to the preparation and delivery of digital lessons. Principals explained that teachers were forced to share outdated or malfunctioning laptops, which limited their ability to prepare multimedia lessons or assess learners through digital platforms. The result is a restricted environment for digital literacy, with learners having minimal opportunities for hands-on engagement with technology. In the same vein, the lack of projectors was seen as detrimental to the visualization and interactivity that CBE seeks to promote. Without projectors, teachers revert to traditional chalk-and-talk methods that limit creativity and comprehension, especially when teaching abstract concepts that would benefit from visual simulations or video-based demonstrations.

The absence of reliable systems for the repair and maintenance of ICT resources emerged as another recurring concern. Principals observed that once ICT devices malfunctioned, they often remained unusable for long periods due to a lack of structured maintenance systems or technical personnel. This situation led to the accumulation of broken devices, creating a sense of futility and frustration among teachers. Ad hoc repairs, often funded through scarce school resources, were unsustainable. Principals proposed establishing county-level ICT maintenance hubs or centralized service contracts to ensure the continued use of digital tools. In a related concern, the lack of technical support staff meant that teachers had to troubleshoot ICT problems themselves,

taking away valuable teaching time and diminishing their confidence in using digital tools. As a result, available devices remained idle, contributing to teachers' resistance to ICT integration.

Inadequate cameras were also highlighted as a key barrier to practical CBE assessment, which heavily relies on documentation and portfolio-based evidence. Principals explained that without cameras, schools could not capture or archive learner projects, practical activities, or performance-based assessments. The reliance on written descriptions, they argued, compromises the validity and richness of learner evaluation. Additionally, teachers' inadequate training in ICT integration was identified as a fundamental challenge undermining CBE's transformative intent. Teachers who lacked digital skills tended to default to traditional teaching methods, even in the presence of technology. This skill gap widened the divide between CBE policy aspirations and classroom realities, depriving learners of the experiential, technology-supported learning envisioned under the new curriculum.

The principals further noted that the absence of smartphones curtailed opportunities for mobile learning, communication with parents, and access to educational applications that could enhance continuous assessment and feedback. The shortage of desktops and tablets was also said to reduce the functionality of ICT laboratories and hinder equitable access to digital learning resources. In many schools, overcrowding in computer labs meant that only a fraction of learners could participate meaningfully in practical ICT lessons, compromising the principle of inclusivity that underpins CBE.

The views of sub-county directors echoed many of these concerns but placed them within a broader systemic context. They emphasized that inadequate internet connectivity remains a foundational constraint across schools in the county, undermining digital learning, innovation, and collaboration. Teachers were described as being cut off

from online communities of practice and unable to share or adapt digital content for their classes. The directors further stated that the shortage of laptops has widened technological disparities between urban and rural schools, thereby impeding equitable CBE implementation. Without access to such tools, both teachers and learners struggle to meaningfully participate in ICT-based instruction.

The absence of projectors, according to sub-county directors, has reinforced outdated pedagogical practices. Teachers have been forced to rely on chalkboards, which limit learner engagement and diminish the experiential nature of CBE. Likewise, the directors underscored the absence of ICT repair and maintenance structures as a systemic failure that leads to long-term device disuse once they break down. Teachers lose motivation to plan ICT-based lessons when they know the equipment may be unavailable or unreliable. The lack of technical support staff exacerbates this issue, as teachers, many of whom lack technical competence, must divert time to troubleshooting equipment rather than instruction.

Sub-county directors also pointed to the shortage of desktops as a significant bottleneck to establishing functional computer laboratories, leading to overcrowding and reduced learner participation. This shortage was seen as directly contradicting the CBE principle of learner-centered instruction. Furthermore, inadequate teacher training on ICT integration was identified as a significant pedagogical weakness. Teachers who had not undergone structured ICT capacity building tended to use available technology superficially or not at all, thereby neutralizing CBE's innovative and creative learning dimensions.

Finally, the directors expressed concern that the limited availability of tablets, smartphones, and iPads for learners has severely constrained personalized and interactive learning. These digital tools were initially intended to facilitate engagement, enhance

learner autonomy, and promote digital inclusivity. However, the scarcity of such devices has meant that learners in most schools cannot participate in modern, technology-enhanced learning processes. The cumulative effect, as emphasized by both principals and sub-county directors, is a significant misalignment between CBE's digital learning vision and the resource realities in public junior schools. Taken together, these qualitative findings reveal that ICT resource challenges in junior schools are both infrastructural and institutional. They reflect not merely shortages of devices or connectivity, but deeper systemic issues related to maintenance, capacity building, and sustainability. The analytical synthesis of responses underscores that without a coherent strategy addressing these interconnected challenges, the promise of CBE as a transformative, technology-driven curriculum will remain only partially realized.

4.4.4 Selected Financial Resource Management Challenges

The respondents were asked to indicate their level of agreement with selected financial resource management challenges in junior schools regarding CBE implementation. The findings were as shown in the Table below.

Table 18

Selected Financial Resource Management Challenges

Statement	SD	D	N	A	SA	Mean
Frequency	F %	F %	F %	F %	F %	
The procurement rules in our school are not followed.	21 (11%)	12 (6%)	25(13%)	64(32%)	75(38%)	4.9492
Auditing practices are not conducted regularly.	25 (13%)	13 (7%)	27(14%)	69(35%)	63(32%)	4.9442
Budgeting practices are not well done.	25 (13%)	25 13%)	16 (8%)	51(26%)	80 41%)	4.9442
School inventory is not well managed.	13 (7%)	14 (7%)	27(14%)	58(29%)	85 43%)	4.9746
Funds allocated for CBE implementation are insufficient.	17 (9%)	24 12%)	19(10%)	73 37%)	64(32%)	4.9797
Funds for CBE resources are not disbursed on time.	24 (12%)	24(12%)	17 (9%)	72(37%)	60(30%)	4.9442
Financial resources are not well-managed to address emerging needs in CBE.	25 (13%)	23(12%)	14 (7%)	62(31%)	73 37%)	4.9746
Cash flow in our school is not adequate.	8 (4%)	23(12%)	30(15%)	78(40%)	58 29%)	4.9898
Cost control in our school is not well managed.	25 (13%)	16 (8%)	24(12%)	56(28%)	76(39%)	4.9797
Asset management in our school is not well done.	8 (4%)	23(12%)	17 (9%)	57(29%)	92(47%)	4.9492
Expenses management in our school is not well controlled.	12 (6%)	20 10%)	26 13%)	56(28%)	83 42%)	4.9848
Debt management in our school is not well done.	11 (6%)	30(15%)	27(14%)	64(32%)	65(33%)	5.0000

The study further examined the financial resource management challenges influencing the implementation of Competency-Based Education (CBE) in junior schools. The results revealed that 11% of respondents strongly disagreed, 6% disagreed, 13% were neutral, 32% agreed, and 38% strongly agreed that procurement procedures are often flouted, yielding a mean score of 4.9492. This means that a majority of respondents (70%) believed that procurement rules in schools are not properly followed. The high

level of agreement suggests systemic weaknesses in adherence to procurement guidelines and accountability structures. Such irregularities may result in financial mismanagement, inflated costs, or the acquisition of substandard teaching and learning materials, which, in turn, undermine the quality of CBE implementation. This finding is consistent with earlier studies by Koech (2020) and Ndirangu (2022), who found that weak procurement oversight in Kenyan public schools often leads to inefficiencies and misuse of educational funds. These results imply that strengthening procurement transparency and accountability mechanisms is critical for ensuring value for money and the effective use of financial resources in the education sector.

The findings further indicated that 13% strongly disagreed, 7% disagreed, 14% were neutral, 35% agreed, and 32% strongly agreed that auditing practices are not conducted regularly, yielding a mean score of 4.9442. This means that about two-thirds (67%) of respondents recognized that school audits are irregular. Such irregularities in auditing create gaps in oversight and may expose schools to financial errors, embezzlement, and weak internal controls. This finding aligns with Mwangi's (2021) conclusion that the absence of consistent auditing practices leads to poor financial accountability and delayed detection of fiscal irregularities. These results imply that regular, independent audits are essential to promoting transparency and maintaining fiscal discipline in the management of CBE funds.

Regarding budgeting practices, 13% of respondents strongly disagreed, 13% disagreed, 8% were neutral, 26% agreed, and 41% strongly agreed that budgeting practices are not well done, resulting in a mean score of 4.9442. This demonstrates that approximately 67% of respondents perceived weaknesses in the preparation and management of school budgets. Inadequate budgeting may lead to poor prioritization of essential CBE needs, such as instructional materials, teacher training, and infrastructure development. This

finding supports earlier studies by Omolo (2020) and Gitau (2021), who argued that weak budgeting capacity among school administrators contributes to inefficient resource allocation and delays in the implementation of key education programs. The results imply that improving budgeting and financial planning skills is essential to ensuring that CBE resources are allocated appropriately to meet learning objectives.

Regarding inventory management, 7% strongly disagreed, 7% disagreed, 14% were neutral, 29% agreed, and 43% strongly agreed that school inventory is not well managed, yielding a mean score of 4.9746. This means that 72% of respondents viewed inventory control systems as weak or ineffective. Poor inventory management may lead to misplacement, underutilization, or theft of critical CBE materials such as laboratory equipment, ICT devices, and textbooks. This finding corroborates Wanjiru's (2022) finding that most public schools lack automated inventory systems, making it difficult to track and maintain resources effectively. These results imply that strengthening inventory management systems through digitization and accountability frameworks could reduce resource wastage and enhance the sustainability of CBE implementation.

Regarding funding adequacy, 9% strongly disagreed, 12% disagreed, 10% were neutral, 37% agreed, and 32% strongly agreed that funds allocated for CBE implementation are insufficient, yielding a mean score of 4.9797. This suggests that nearly 69% of respondents felt that CBE funding is inadequate. Inadequate funding limits schools' ability to provide adequate learning infrastructure, instructional materials, and teacher capacity development programs. This result is consistent with findings by UNESCO (2021) and Ng’ang’a (2022), who reported that low capitation and inconsistent funding constrain education reforms in many developing countries. These findings imply that sustainable implementation of CBE depends on increased government investment and timely allocation of adequate financial resources.

The results also showed that 12% strongly disagreed, 12% disagreed, 9% were neutral, 37% agreed, and 30% strongly agreed that funds for CBE resources are not disbursed on time, yielding a mean score of 4.9442. This indicates that about 67% of respondents affirmed that delayed disbursement of funds affects school operations. Such delays hinder the timely acquisition of instructional materials and affect the scheduling of CBE activities. This finding echoes Odhiambo's (2020) conclusion that delayed fund transfers from the Ministry of Education disrupt planning and lead to inefficiencies in curriculum delivery. These results imply that timely fund disbursement is essential to support the operational and instructional demands of CBE.

The study further revealed that 13% of respondents strongly disagreed, 12% disagreed, 7% were neutral, 31% agreed, and 37% strongly agreed that financial resources are not well managed to address emerging needs in CBE, giving a mean score of 4.9746. This suggests that 68% of respondents perceived inadequacies in financial management practices. Poor management of financial resources prevents schools from responding effectively to emerging CBE priorities such as continuous assessments, digital learning, and student-centered projects. This finding supports Kilonzo's (2021) observations that financial mismanagement and the lack of strategic allocation reduce adaptability to education reforms. These results imply that school administrators must enhance their financial management competencies to allocate resources flexibly and efficiently in response to evolving educational needs.

Additionally, 4% strongly disagreed, 12% disagreed, 15% were neutral, 40% agreed, and 29% strongly agreed that school cash flow is inadequate, with a mean score of 4.9898. This means that about 69% of teachers reported cash flow challenges in their institutions. Inconsistent cash flow disrupts procurement, service payments, and daily school operations, negatively impacting CBE implementation. This finding corroborates earlier

research by Mugambi (2020), who found that liquidity challenges in schools often lead to delayed project execution and inefficiencies in resource utilization. The implication is that maintaining a stable cash flow system is vital for the smooth and continuous functioning of school activities aligned with CBE requirements.

The results further indicated that 13% of respondents strongly disagreed, 8% disagreed, 12% were neutral, 28% agreed, and 39% strongly agreed that cost control in schools is not well managed, producing a mean score of 4.9797. This means that 67% of teachers acknowledged weak cost control measures. Ineffective cost control may lead to overspending, waste, and misallocation of limited educational funds. This finding aligns with Otieno's (2021) conclusion that weak financial monitoring mechanisms contribute to resource waste in school operations. These results imply that effective cost control strategies, including internal audits and expenditure reviews, are essential for prudent financial management under CBE.

It was also found that 4% of respondents strongly disagreed, 12% disagreed, 9% were neutral, 29% agreed, and 47% strongly agreed that asset management in schools is not well done, yielding a mean score of 4.9492. This indicates that 76% of respondents believed that asset management practices are poor. Ineffective asset management leads to the deterioration, loss, or underutilization of key assets, such as ICT tools and laboratory facilities, necessary for CBE delivery. This finding supports Kamau's (2020) work, which emphasized that the lack of structured asset management frameworks in Kenyan schools contributes to frequent equipment breakdowns and high replacement costs. These results imply that instituting asset registers and maintenance schedules is essential to preserving critical school resources for effective CBE implementation.

In addition, 6% strongly disagreed, 10% disagreed, 13% were neutral, 28% agreed, and 42% strongly agreed that school expense management is poorly controlled, yielding a

mean score of 4.9848. This suggests that 70% of respondents viewed expenditure management as weak. Poor control of school expenses can result in unnecessary costs, fund diversion, or the accumulation of unpaid liabilities, thereby undermining financial sustainability. This finding concurs with those of Chege (2022), who highlighted that poor expenditure oversight in public institutions often leads to budget deficits and inefficiencies. These results imply that stronger financial oversight mechanisms are necessary to ensure efficient and accountable use of CBE funds.

Finally, 6% strongly disagreed, 15% disagreed, 14% were neutral, 32% agreed, and 33% strongly agreed that debt management in schools is not well done, yielding a mean of 5.0000. This implies that 65% of respondents recognized debt management as a significant financial challenge. Poor debt management results in liquidity constraints, delays in project completion, and challenges in paying suppliers or staff on time. This finding supports Ndungu's (2021) observation that weak debt control mechanisms in schools often lead to long-term financial instability. These results imply that effective debt management practices, including debt monitoring, repayment planning, and economic forecasting, are crucial for maintaining fiscal stability and ensuring smooth implementation of CBE.

Overall, the mean scores across all financial management indicators ranged between 4.9442 and 5.0000, reflecting widespread agreement that financial management challenges, particularly inadequate funding, poor budgeting, delayed disbursement, weak procurement, and debt mismanagement, significantly impede the implementation of CBE in junior schools. These findings underscore the need for strengthened financial governance structures, timely fund allocation, and enhanced accountability mechanisms to promote efficiency, transparency, and sustainability in CBE implementation.

Overall, the mean scores ranging from 4.9442 to 5.0000 indicate strong agreement across all items, confirming that financial management challenges, including weak procurement, delayed disbursements, poor budgeting, insufficient funds, and ineffective debt management, significantly affect CBE implementation. The researcher concludes that strengthening financial governance, ensuring timely disbursement, and enhancing fiscal accountability are crucial for improving CBE sustainability in Kenya's junior schools.

The findings align with those of Too et al. (2024), who observed that weak adherence to procurement procedures and mismanagement of school resources undermine educational reforms. In this study, 70% of respondents agreed or strongly agreed that procurement rules are not followed (mean = 4.9492). This indicates that weak procurement processes in junior schools may lead to inefficiencies in acquiring CBE resources, misallocation of funds, and reduced accountability, thereby compromising the quality and timely implementation of CBE programs.

The results further support Amunga et al. (2020), who noted that inadequate financial oversight, including irregular audits, contributes to the mismanagement of school resources. In the present study, 67% of respondents agreed that auditing practices are not conducted regularly (mean = 4.9442). This finding implies that irregular audits can leave schools vulnerable to financial errors, misappropriation of funds, and a lack of transparency, thereby negatively affecting the procurement and management of CBE teaching and learning materials.

In terms of budgeting, the findings align with Momanyi and Rop (2019), who emphasized that poor financial planning hinders effective curriculum implementation. In this study, 67% of respondents agreed that budgeting practices are inadequately conducted (mean = 4.9442). Weak budgeting practices delay or limit the allocation of

funds for essential CBE activities, such as acquiring teaching aids, digital devices, and experiential learning resources, which are critical to learner-centered approaches. Inventory management challenges were also identified as a significant barrier, with 72% of respondents indicating inadequate control over school assets (mean = 4.9746). This finding corroborates Mulangi (2024), who reported that ineffective management of school assets, including educational materials and ICT devices, constrains schools' capacity to implement curriculum reforms. Poor inventory systems increase the likelihood of loss, misplacement, and underutilization of critical resources, affecting CBE's practical and technology-based learning activities.

The findings on funding adequacy mirror those of Obara (2019) and Ntumi et al. (2023), who found that insufficient financial allocation limits schools' ability to provide teaching infrastructure, instructional materials, and teacher training. In the current study, 69% of respondents agreed that funds allocated for CBE are insufficient (mean = 4.9797). Similarly, 67% of respondents reported delays in fund disbursement (mean = 4.9442). These financial constraints hinder the timely acquisition of learning resources and impede the effective planning and execution of CBE initiatives. Cash flow and expenditure management challenges were also highlighted. A majority of respondents agreed that cash flow is inadequate (69%, mean = 4.9898), cost control is weak (67%, mean = 4.9797), and expenses are poorly managed (70%, mean = 4.9848). These findings indicate that daily operations, staff payments, and timely procurement of resources are negatively affected, echoing Waruingi et al. (2022), who emphasized that inefficient financial management disrupts curriculum implementation.

Finally, debt and asset management were identified as critical concerns, with 65% of respondents highlighting poor debt management (mean = 5.0000) and 76% indicating ineffective asset management (mean = 4.9492). These findings reinforce Mulangi's

(2024) observations, which emphasized that prudent financial governance, accountability, and timely disbursement of funds are essential for sustaining CBE implementation. Weak financial management, including poor control over assets and liabilities, constrains schools' ability to adapt to emerging CBE demands, such as the integration of ICT tools and the provision of learner-centered resources.

The analysis of financial resource management challenges reveals that junior schools in Baringo County face substantial fiscal and administrative constraints that directly impede the effective implementation of the Competency-Based Education(CBE). The data indicate that a majority of respondents strongly agreed across most items, confirming the persistence of weak procurement systems, poor budgeting practices, delayed disbursements, and inadequate financial oversight. Such systemic weaknesses undermine planning, disrupt learning programs, and limit schools' ability to acquire the materials and infrastructure essential for CBE execution. These findings align with broader concerns in the educational management literature about fiscal accountability and the efficiency of resource allocation as critical determinants of curriculum success.

From the qualitative insights obtained through interviews with principals, it was evident that financial challenges manifest in various interconnected ways. Principals consistently noted that poor cost control results in inefficient use of limited resources, leading to duplication, wastage, and the inability to meet pressing CBE needs. Delayed disbursement of government funds was identified as a recurring bottleneck, with schools reporting frequent procurement interruptions, delayed teacher support activities, and stalled infrastructure projects. These delays, according to the principals, create a cycle of disrupted implementation that erodes both teacher morale and learner progress. The inadequacy of capital allocation further exacerbates this situation by limiting the capacity

to develop ICT infrastructure, laboratories, and other learning spaces essential for the experiential learning envisioned under CBE.

The principals also highlighted that insufficient overall funding compels schools to prioritize only core academic areas at the expense of the holistic learning experiences that CBE seeks to nurture, such as creativity, innovation, and co-curricular engagement. Poor expenditure control and noncompliance with procurement regulations were reported to facilitate financial leakages and reduce transparency. Moreover, irregular auditing practices were perceived as promoting complacency and weakening accountability structures. Weak inventory and asset management systems were equally problematic, leading to loss, underutilization, and deterioration of essential CBE resources such as laptops, science kits, and furniture. Collectively, these factors reflect deep-seated governance and operational inefficiencies that compromise the sustainability of CBE implementation.

The views of sub-county directors corroborated those of the principals, adding a broader administrative perspective on the systemic nature of financial challenges. The directors reported that ineffective financial management leads to the wastage and misallocation of funds that could otherwise support essential CBE activities, such as teacher training and the provision of instructional materials. Delays in disbursing government funds were identified as particularly detrimental, disrupting the scheduling of CBE activities, procurement cycles, and payment of non-teaching staff, thereby creating operational instability. Inadequate capital allocation was also identified as a barrier to infrastructure expansion, leading to overcrowded classrooms and insufficient learning facilities.

Furthermore, the sub-county directors noted that weak expense controls and noncompliance with procurement regulations create opportunities for corruption and the procurement of substandard materials, ultimately diminishing educational quality. Poor

management of resources for emerging issues, such as unanticipated training demands or infrastructure breakdowns, was said to render schools reactive rather than proactive. Inadequate asset and inventory management further reduces efficiency, as schools experience resource shortages in some areas while others accumulate idle or unused materials. The absence of regular audits compounds these challenges by eroding accountability and public trust, particularly when it comes to CBE funds.

Taken together, the perspectives of both principals and sub-county directors paint a coherent picture of financial mismanagement as a structural impediment to effective CBE implementation. The analytical interpretation suggests that sustainable curriculum reform requires not only increased funding but also improved financial governance, stronger audit mechanisms, and adherence to transparent procurement practices. In the context of public junior schools, these measures are indispensable for fostering fiscal discipline, ensuring equitable resource distribution, and creating an enabling environment for the pedagogical transformation that CBE envisions.

4.3 Regression Analysis

Regression analysis was employed to assess the influence of management challenges on the implementation of the Competency-Based Education (CBE) in public junior schools in Baringo County. Each of the four predictor variables, human resource, physical resource, ICT resource, and financial resource management challenges, was first tested independently against the CBE Implementation Index to evaluate its unique predictive power. Thereafter, a multiple regression model was fitted to assess the combined effect of all management challenges on CBE implementation. The sample size for the analysis was 197 respondents.

4.3.1 Influence of Human Resource Management Challenges on the Implementation of CBE

The first objective of the study was to examine the influence of human resource management challenges on the implementation of Competency-Based Education (CBE) in public junior schools in Baringo County. The study specifically sought to determine whether factors such as teacher qualifications, staffing adequacy, and opportunities for professional development significantly affect the successful execution of CBE in these institutions.

Table 19

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.184	0.034	0.029	0.46912

The findings presented in Table 18 reveal that the regression model recorded an R value of 0.184 and an R Square of 0.034, indicating that human resource management challenges explain only 3.4% of the variation in the implementation of the Competency-Based Education (CBE) in public junior schools in Baringo County. This minimal explanatory power suggests that, while human resource factors such as teacher qualifications, training, workload, and resistance to change are essential for curriculum delivery, they account for a relatively small portion of the differences observed in CBE implementation across schools.

The low R^2 value suggests that variables not included in the current model may have a greater impact on the practical implementation of CBE. For instance, leadership practices, including school administrators' management styles and their capacity to motivate and supervise teachers, may play a critical role in shaping the fidelity and quality of curriculum delivery. Similarly, the clarity and communication of policy

directives from the Ministry of Education could significantly influence how teachers interpret and operationalize CBE requirements, ensuring consistency in lesson planning, assessment, and learner-centered pedagogy. Additionally, community engagement factors, such as parental support, local resource mobilization, and school board involvement, may help create an enabling environment for CBE.

These results indicate that, although human resource management challenges are a relevant component, they alone are insufficient to explain the variability in CBE implementation. This finding corroborates previous studies, including those by Ngeno et al. (2021) and Waweru (2020), which highlighted that successful curriculum reforms require a multi-dimensional approach encompassing leadership, policy support, infrastructure, and community participation alongside human resource capacity. Therefore, addressing human resource challenges while necessary must be complemented by interventions targeting institutional, policy, and community-level factors to achieve meaningful and sustained improvements in CBE implementation.

Table 20

ANOVAa

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	3.214	1	3.214	1.539	.217b
Residual	406.279	195	2.084		
Total	409.493	196			

The ANOVA results in Table 19 further reveal that the regression model was not statistically significant ($F(1,195) = 1.539$, $p = 0.217$), indicating that human resource management challenges do not significantly predict variations in CBE implementation levels. The p-value, which is above the 0.05 threshold, suggests that the independent variable lacks sufficient explanatory power to produce a statistically valid model. This

means that the influence of teacher-related challenges, including qualifications, staffing adequacy, and professional development, may not be strong enough to predict CBE outcomes at a statistically significant level.

Table 21

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.215	0.315		10.206	.000
HR Challenges	0.184	0.149	0.109	1.241	.217

The coefficients presented in Table 20 indicate a positive but statistically insignificant relationship between human resource management challenges and the implementation of the Competency-Based Education (CBE), with a regression coefficient (β) of 0.184 and a p-value greater than 0.05. This suggests that a one-unit increase in human resource management challenges is associated with a 0.184 increase in the CBE Implementation Index. However, the lack of statistical significance indicates that the observed relationship may be due to random variation rather than a substantive causal effect. The fitted regression model, $Y = 3.215 + 0.184X$, provides a predictive framework, but its explanatory power remains limited.

From an analytical perspective, these findings suggest that although human resource management challenges such as inadequate teacher preparation for CBE, insufficient professional development, and resistance to adopting new teaching methodologies are present, they do not independently exert a strong influence on curriculum implementation outcomes. This could be interpreted to mean that teachers, despite professional and resource constraints, can still implement CBE practices effectively through adaptive strategies. For example, teachers might rely on improvisation, peer

collaboration, mentorship, or experiential knowledge to navigate challenges and deliver curriculum objectives. This practical resilience reduces the statistical visibility of human resource constraints in the model, as compensatory behaviors and informal coping mechanisms mitigate their effects.

These results align with previous studies, such as Ngeno et al. (2021) and Waweru (2020), which emphasized that teacher commitment, professional ingenuity, and collaborative practices can buffer the impact of HR limitations on curriculum outcomes. Additionally, the positive coefficient, though not significant, suggests that human resource challenges may still exert some influence on CBE implementation, though other critical factors, including leadership effectiveness, policy clarity, infrastructure adequacy, and community involvement, likely overshadow this effect.

4.3.2 Influence of Physical Resource Management Challenges on the Implementation of CBE

The second objective of the study was to determine the influence of physical resource management challenges on the implementation of Competency-Based Education (CBE) in public junior schools in Baringo County. The analysis aimed to assess whether factors such as classroom adequacy, availability of instructional materials, and access to teaching aids significantly influence CBE implementation.

Table 22

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.020	0.0004	-0.005	0.47245

As shown in Table 21, the R-square value of 0.0004 indicates that physical resource management challenges account for less than 1% of the variation in CBE implementation

across public junior schools. This extremely low explanatory power suggests that, within the parameters of this model, factors such as classroom adequacy, availability of learning materials, teaching aids, and other physical infrastructure elements have a statistically negligible influence on curriculum implementation outcomes. In other words, differences in CBE performance across schools are largely unaffected by the measured variations in physical resources, at least in the linear sense captured by the model.

The minimal R^2 value highlights that physical resources alone may not be a dominant determinant of CBE success. While classroom space, laboratories, libraries, textbooks, and teaching aids are essential for creating an enabling learning environment, their direct contribution to the variation in curriculum implementation appears limited when examined in isolation. This finding aligns with prior research by Ngeno et al. (2021) and Waweru (2020), which suggested that schools often compensate for inadequate physical resources through innovative teaching strategies, collaborative lesson planning, and improvisation using locally available materials. Consequently, even in the presence of resource constraints, teachers may find ways to deliver CBE effectively, thereby reducing the measurable impact of physical resources on implementation outcomes.

Furthermore, the low R^2 suggests that other factors, such as human resource capacity, teacher motivation, leadership practices, policy clarity, and community engagement, may exert a far greater influence on CBE implementation success. These results suggest that focusing solely on improving physical resources without addressing complementary factors may not substantially improve curriculum performance. In analytical terms, the negligible linear association captured by this model suggests the need for a more holistic approach to understanding CBE implementation, in which physical infrastructure interacts with human, managerial, and institutional variables to shape overall outcomes.

Table 23

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	0.033	1	0.033	0.020	.888b
Residual	409.460	195	2.100		
Total	409.493	196			

Table 22 presents the ANOVA results, which indicate that the model is not statistically significant ($F(1, 195) = 0.020$, $p = 0.888$). The very high p-value suggests that there is no meaningful predictive relationship between physical resource management challenges and CBE implementation. This outcome implies that classroom availability and the adequacy of libraries and learning materials may not directly influence how teachers implement CBE, possibly because other factors, such as teacher motivation, administrative support, and adaptive pedagogy, mediate the impact of these resources.

Table 24

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.191	0.323		9.874	.000
Physical Challenges	0.020	0.141	0.009	0.143	.888

The coefficients presented in Table 23 indicate a positive but statistically insignificant relationship between physical resource management challenges and the implementation of the Competency-Based Education (CBE), with a regression coefficient (β) of 0.020 and a p-value greater than 0.05. This suggests that a one-unit increase in physical resource challenges is associated with a marginal 0.020 increase in the CBE

Implementation Index; however, the lack of significance indicates that this relationship is likely due to random variation rather than a meaningful causal effect. The fitted regression model, $Y = 3.191 + 0.020X$, indicates minimal influence of physical resource constraints on observed differences in CBE implementation across schools.

From the researcher's analytical perspective, this pattern implies that although physical resources such as classrooms, laboratories, teaching aids, furniture, and learning materials are fundamental to providing a conducive learning environment, they are not the sole or strongest determinants of CBE success in Baringo County. The negligible statistical effect suggests that teachers may be compensating for resource inadequacies through improvisation, peer collaboration, community support, or alternative instructional strategies that maintain curriculum delivery despite infrastructural deficits. For example, teachers might organize group activities in shared spaces, use locally available materials to simulate laboratory experiments, or engage parents and community members in supporting learning activities, thereby mitigating the observable impact of physical resource constraints.

4.3.3 Influence of ICT Resource Management Challenges on the Implementation of CBE

The third objective of the study was to examine the extent to which ICT resource management challenges affect the implementation of Competency-Based Education (CBE) in public junior schools in Baringo County. The focus was on evaluating how the availability of computers, internet connectivity, and teachers' and learners' digital literacy impacts the practical delivery of the curriculum.

Table 25

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.088	0.003	-0.002	0.47160

As shown in Table 24, ICT management challenges accounted for only 0.3% of the variation in CBE implementation, as indicated by the extremely low R^2 value. This minimal predictive power suggests that, within the scope of this model, variations in ICT resources such as availability of computers, internet connectivity, digital devices, and teacher digital competence have a minimal effect on explaining differences in the effectiveness of CBE implementation across junior schools in Baringo County.

The low R^2 indicates that while ICT resources are essential for facilitating interactive and learner-centered instruction, their contribution to observable differences in CBE implementation is marginal when considered in isolation. This finding implies that schools may be compensating for ICT limitations through alternative teaching strategies, peer support, and offline learning methods that sustain curriculum delivery even in the absence of robust digital infrastructure. It also suggests that the mere presence of ICT tools is insufficient to drive curriculum outcomes unless accompanied by complementary factors such as teacher training, pedagogical integration, and supportive school management.

Table 26

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	0.919	1	0.919	0.239	.625b
Residual	408.574	195	2.096		
Total	409.493	196			

The ANOVA results in Table 25 show that the regression model is not statistically significant ($F(1,195) = 0.239$, $p = 0.625$). This result means that ICT-related management challenges do not have a statistically meaningful influence on the degree of CBE implementation. Despite the national emphasis on integrating digital learning under CBE, this finding indicates that technology challenges are not currently a significant determinant of implementation success in this region.

Table 27

Coefficient

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.177	0.311		10.214	.000
ICT Challenges	0.088	0.181	0.041	0.489	.625

The coefficients presented in Table 26 indicate a positive but statistically insignificant relationship between ICT management challenges and the implementation of the Competency-Based Education (CBE), with a regression coefficient (β) of 0.088 and a p-value greater than 0.05. The fitted regression model, $Y = 3.177 + 0.088X$, suggests that a one-unit increase in ICT management challenges is associated with a marginal increase of 0.088 in the CBE Implementation Index. However, the lack of statistical significance indicates that this observed relationship is likely due to random variation rather than a substantive causal effect.

From an analytical standpoint, this result might appear counterintuitive, as one would typically expect that ICT challenges such as limited computer access, poor internet connectivity, and insufficient digital competence would hinder curriculum implementation. However, the finding reflects the reality of many rural junior schools in

Baringo County, where digital integration is still in its nascent stages and teachers primarily rely on non-digital, conventional pedagogies to deliver CBE. In such contexts, the minimal ICT infrastructure does not substantially alter curriculum outcomes, as teachers adapt by using low-tech instructional strategies, improvising learning materials, and leveraging traditional teaching methods to achieve learning objectives.

4.3.4 Influence of Financial Resource Management Challenges on the Implementation of CBE

The fourth objective was to determine how financial resource management challenges affect the implementation of Competency-Based Education (CBE) in public junior schools in Baringo County. The analysis examined whether limited budgetary allocations, delayed capitation payments, and inadequate funding for learning materials significantly affect CBE implementation outcomes.

Table 28

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.249	0.062	0.058	0.45238

The results presented in Table 27 indicate that the regression model produced an R value of 0.249 and an R Square of 0.062, suggesting that financial resource management challenges explain 6.2% of the variation in the implementation of the Competency-Based Education (CBE) in public junior schools. While this level of explanatory power is modest, it is notably higher than that observed for human resource management (3.4%), physical resource management (0.04%), and ICT management challenges (0.3%). This finding suggests that financial constraints constitute a more influential determinant of CBE implementation than the other resource categories examined in this study.

The R^2 value of 0.062 implies that, although financial management is not the sole driver of CBE outcomes, it has a measurable impact on schools' ability to implement the curriculum effectively. Financial challenges such as inadequate funding allocations, delayed disbursement of resources, weak budgeting and expenditure control, and insufficient cash flow can directly affect the availability of instructional materials, teacher professional development, and infrastructural support, all of which are critical for achieving learner-centered, competency-based outcomes. The modest R^2 further indicates that, despite its relative importance, financial management is only one component of a complex set of factors influencing CBE implementation, including leadership practices, teacher capacity, policy clarity, community involvement, and school culture.

Table 29

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	25.312	1	25.312	5.458	.021b
Residual	384.181	195	2.036		
Total	409.493	196			

The ANOVA results in Table 28 confirm that the regression model is statistically significant ($F(1,195) = 5.458$, $p = 0.021$). This indicates that financial resource management challenges significantly affect the implementation of CBE in public junior schools. The significance of the F-statistic implies that the overall model is a good fit and that the relationship between financial constraints and CBE implementation is not due to random variation.

Table 30

Coefficient

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.341	0.277		12.064	.000
Financial Challenges	-0.488	0.209	-0.249	-2.336	.021

The coefficients presented in Table 29 reveal a significant negative relationship between financial resource management challenges and the implementation of the Competency-Based Education (CBE), with a regression coefficient (β) of -0.488 and a p-value less than 0.05. The fitted regression model, Y = 3.341 - 0.488X, indicates that an increase in financial management challenges is associated with a decrease in the CBE Implementation Index. This finding demonstrates that schools experiencing severe financial constraints face considerable difficulties in procuring essential teaching and learning materials, funding professional development programs, and providing the necessary infrastructure to facilitate effective CBE delivery.

From the researcher's analytical perspective, the negative relationship underscores the pivotal role of financial support in sustaining curriculum reforms. Inadequate funding not only limits access to physical and instructional resources but also affects teacher motivation, innovation, and the overall quality of curriculum execution. Teachers may be unable to implement learner-centered pedagogies effectively if they lack teaching aids, access to training, or opportunities for continuous professional development, which are all dependent on sufficient financial resources

4.3.4 Combined Regression Analysis (All Four Variables)

The study used multivariate linear regression to examine the relationships between management issues in human resources, information and communications technology (ICT), physical resources, and financial resources, and Competency-Based Education (CBE). The regression equation was as follows:

$$CBCImplementationIndex = \beta_0 + \beta_1(HRMChallenges) + \beta_2(ICTChallenges) + \beta_3(PRMChallenges) + \beta_4(FINChallenges) + \epsilon$$

The following output presents the findings of the regression analysis, including the estimated coefficients, significance levels, and the most crucial model fit indicators.

Table 31

Regression Summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.201[a]	.040	.020	.16479	1.042

a. Predictors: (Constant), PRM Challenges, FIN Challenges, HRM Challenges, ICT Challenges

b. Dependent Variable: CBE Implementation Index

The R-squared value of 0.040 indicates that the combined independent variables, namely, human resource management (HRM) challenges, ICT challenges, physical resource management (PRM) challenges, and financial (FIN) challenges, collectively explain only 4% of the variation in CBE implementation across the sampled junior schools. This low explanatory power suggests that most variation in curriculum implementation is driven by not

The low Adjusted R-squared value of 0.020 further reinforces this conclusion, given the number of predictors in the model, and indicates that the independent variables provide minimal predictive utility when degrees of freedom are accounted for. In practical terms, this means that while HRM, ICT, PRM, and financial challenges are relevant to CBE implementation, their combined contribution to explaining observed differences among schools is limited.

The Durbin-Watson statistic of 1.042 suggests that the residuals are not autocorrelated, allowing the assumption that they are independent. This indicates that the regression errors do not exhibit systematic patterns across observations, thereby satisfying one of the key assumptions of classical linear regression and supporting the validity of the model's coefficient estimates.

Table 32

Analysis of Variance

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.217	4	.054	2.001	.096[b]
	Residual	5.187	191	.027		
	Total	5.404	195			

a. Dependent Variable: CBE Implementation Index

b. Predictors: (Constant), PRM Challenges, FIN Challenges, HRM Challenges, ICT Challenges

The F-statistic of 2.001, accompanied by a p-value of 0.096, indicates that the regression model as a whole does not significantly predict the CBE Implementation Index. This means that collectively, the independent variables human resource management (HRM) challenges, ICT challenges, physical resource management (PRM) challenges, and

financial (FIN) challenges do not provide a statistically reliable explanation of the observed variation in CBE implementation across junior schools.

Additionally, the low regression sum of squares value of 0.217 reinforces this conclusion, suggesting that the independent variables account for only a minimal portion of the total variation in CBE outcomes. In practical terms, this implies that the model fails to capture the majority of the factors influencing curriculum implementation, suggesting that other variables, such as school leadership, policy clarity, teacher motivation, community involvement, and institutional culture, may play a more substantial role in determining CBE success.

Table 33

Regression Coefficients

Coefficients[a]										
	Unstandardized Coefficients		Standardized Coefficients		Sig.	Correlations			Collinearity Statistics	
Model	B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1 (Constant)	3.765	1.167		3.226	.001					
HRM Challenges	.184	.149	.100	1.239	.217	.109	.089	.088	.775	1.291
FIN Challenges	-.488	.210	-.181	-2.326	.021	-.159	-.166	-.165	.834	1.199
ICT Challenges	.088	.179	.041	.489	.625	-.001	.035	.035	.707	1.415
PRM Challenges	.020	.142	.012	.141	.888	.053	.010	.010	.696	1.437

a. Dependent Variable: CBE Implementation Index

The findings of the regression analysis will be further discussed and interpreted in the Findings section, where the main factors affecting the implementation of CBE are presented in a comprehensive way.

4.3.5 The Impact of Human Resource Management Challenges on the Implementation of CBE

The regression analysis revealed that human resource management (HRM) challenges did not have a statistically significant impact on the CBE Implementation Index (B = 0.184, p = 0.217). Although the positive coefficient suggests a potential positive relationship, the lack of statistical significance indicates that HRM challenges, such as teacher qualifications, professional development opportunities, and training in CBE pedagogies, do not independently account for measurable differences in curriculum implementation across junior schools.

From an analytical perspective, this finding implies that, despite HRM issues such as inadequate training, resistance to change, or workload pressures, teachers may continue to implement CBE through adaptive strategies. These strategies might include improvising in lesson delivery, collaborating with colleagues, and relying on accumulated professional experience. Such compensatory practices could mitigate the observable effects of HRM challenges on curriculum outcomes, accounting for the non-significant coefficient.

4.3.6 The Impact of Physical Resource Management Challenges on the Implementation of CBE

The regression analysis indicated that physical resource management (PRM) challenges did not have a statistically significant impact on the CBE Implementation Index (B = 0.020, p = 0.888). Despite observable shortages in classrooms, teaching materials, laboratories, and other essential facilities, the results suggest that these physical resource constraints do not, in isolation, exert a measurable influence on the success or failure of CBE implementation in junior schools.

From an analytical standpoint, this finding implies that teachers and school administrators may be compensating for the lack of physical resources through adaptive strategies. For instance, instructional improvisation, sharing of limited materials, collaborative teaching approaches, and community support could mitigate the effects of infrastructural deficits, allowing the curriculum to be delivered despite resource limitations. These adaptive practices help sustain classroom activities, practical exercises, and learner-centred teaching, thereby reducing the observable statistical impact of PRM challenges on the CBE Implementation Index.

4.3.7 How ICT Resource Management Challenges Affect the Implementation of CBE

A statistically significant relationship with the CBE Implementation Index (B = 0.088, p = 0.625). Although constraints such as limited access to computers, unreliable internet connectivity, and inadequate digital tools are frequently reported in educational settings, the findings indicate that these challenges do not substantially influence the implementation of CBE in junior public schools.

Analytically, this outcome suggests that schools may be mitigating ICT limitations through alternative, non-digital pedagogical strategies. Teachers appear to sustain competency-based instruction by utilising conventional teaching methods, improvising with locally available resources, and applying collaborative or experiential learning approaches that do not depend heavily on digital technologies. These adaptive practices likely reduce the observable effect of ICT-related deficiencies on the overall CBE Implementation Index.

4.3.8 How Financial Resource Management Challenges Affect the Implementation of CBE

Unlike human, physical, and ICT-related challenges, financial resource management (FIN) challenges demonstrated a significant negative impact on the CBE Implementation Index (B = -0.488, p = 0.021). The negative coefficient indicates that as financial constraints increase, the level of CBE implementation decreases. This finding implies that inadequate financial resources, such as insufficient funding for teaching and learning materials, delayed disbursement of funds, limited teacher training programs, and insufficient infrastructure, directly hinder the effective delivery of the curriculum in junior schools.

From an analytical standpoint, this relationship underscores that financial constraints are a critical determinant of curriculum success. Schools experiencing limited financial support may struggle to procure essential learning materials, maintain classrooms and laboratories, implement continuous professional development for teachers, and support innovative or competency-based instructional strategies. Consequently, these financial limitations can compromise both the quality and consistency of CBE implementation.

4.4 Model Diagnostic Tests

4.4.1 Normality

Normality tests of the regression residuals, based on the Kolmogorov-Smirnov and Shapiro-Wilk tests, indicated that the normality assumption is satisfied.

Table 34

Normality Test

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Unstandardized Residual	.054	196	.200*	.988	196	.083

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

The Kolmogorov-Smirnov test yielded a p-value of 0.200, and the Shapiro-Wilk test produced a p-value of 0.083. Both values exceed the standard significance level of 0.05, indicating that the residuals do not significantly deviate from normality. This satisfies the normality assumption required for multiple regression analysis. The confirmation of normality enhances the reliability of the regression estimates, including coefficients, standard errors, and significance tests. It ensures that inferential statistics derived from the model, such as confidence intervals and hypothesis tests, are valid. Therefore, the regression model can be considered robust, and subsequent analyses of the effects of human resource, physical resource, ICT, and financial management challenges on CBE implementation can be conducted with confidence.

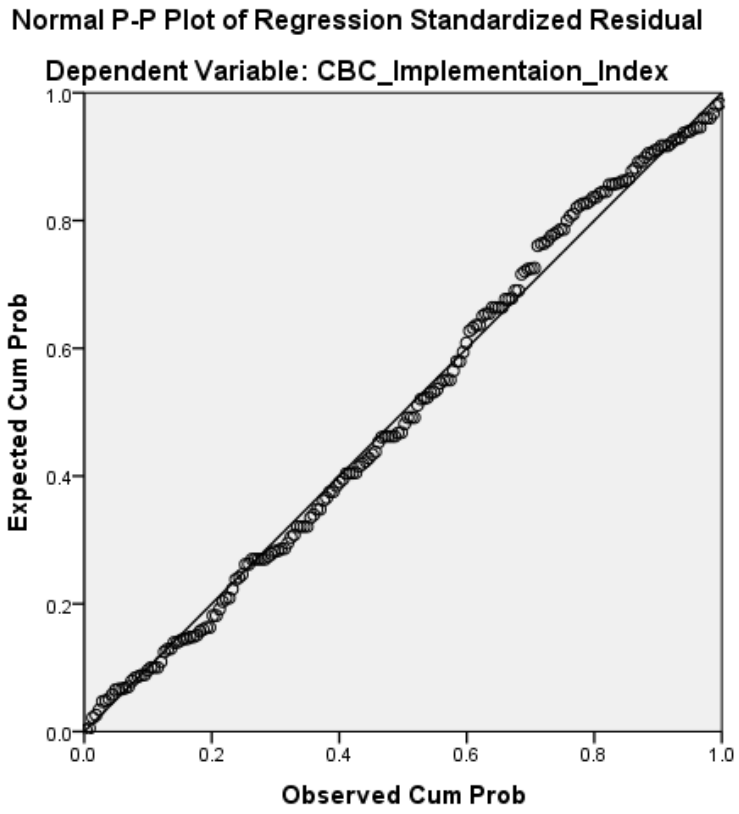
4.4.1 Linearity

The normal Q–Q plot of the standardised residuals provides a visual assessment of the extent to which the residuals from the fitted regression model follow a normal distribution. In this plot, the empirical distribution of the residuals is compared with the theoretical distribution of a standard normal variable. When residuals are normally distributed, the plotted points are expected to align closely with the 45-degree reference line.

In the present visualisation, the points follow the reference line closely, suggesting that the residuals approximate a normal distribution. This visual observation is consistent with the results of the Kolmogorov–Smirnov and Shapiro–Wilk tests, which both indicate that the normality assumption is met. As a result, the model's estimates and statistical inferences including hypothesis tests and confidence intervals can be considered reliable and valid for examining the influence of human resource, physical resource, ICT, and financial management challenges on CBE implementation.

Figure 2

Linearity Test



Analysis of the normal Q-Q plot shows that the data points lie close to the 45-degree reference line, indicating that the residuals are approximately normally distributed. The absence of pronounced deviations or outliers further supports the findings of the Kolmogorov-Smirnov and Shapiro-Wilk tests, which also confirmed normality.

Consequently, the assumption of normality for the residuals is satisfied, justifying the use of the regression model. This validation ensures that the model is appropriate for making reliable inferences and interpretations regarding the effects of human resource, physical resource, ICT, and financial management challenges on the implementation of CBE.

4.4.2 Homoscedasticity

The Breusch-Pagan test was conducted to examine heteroscedasticity in the regression model, which assesses whether the variance of the residuals is constant across levels of the independent variables. Heteroscedasticity can compromise the efficiency and reliability of ordinary least squares (OLS) estimates, leading to biased standard errors and invalid hypothesis tests. In this analysis, the R-squared value obtained from regressing the squared residuals on the independent variables physical resource management (PRM) challenges, financial (FIN) challenges, human resource management (HRM) challenges, and ICT challenges was 0.003. This extremely low value indicates that these independent variables account for only 0.3% of the variance in squared residuals, suggesting a negligible relationship between the predictors and the residual dispersion. Such a weak explanatory power strongly suggests the absence of systematic heteroscedasticity in the model.

Furthermore, the negative adjusted R-squared value of -0.018 reinforces this conclusion. A negative adjusted R-squared indicates that the model does not improve prediction over a simple mean-based model, suggesting that the included independent variables fail to meaningfully describe the variation in the squared residuals. In essence, this implies that the residuals' variance is uniform mainly across the levels of PRM, FIN, HRM, and ICT challenges. Taken together, these results indicate that the assumption of homoscedasticity is satisfied and that the residuals' variability does not change systematically with the

independent variables. This strengthens the validity of the regression results, ensuring that the standard errors of the coefficient estimates are unbiased and that hypothesis tests for the effects of HRM, PRM, ICT, and financial challenges on CBE implementation are reliable. Therefore, the model can be confidently used for inference without concern for heteroscedasticity-related distortions.

Table 35

Breusch-Pagan Test Summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.056[a]	.003	-.018	1.16801	2.084

a. Predictors: (Constant), PRM Challenges, FIN Challenges, HRM Challenges, ICT Challenges

b. Dependent Variable: Residuals Squared

Table 36

Breusch-Pagan Test ANOVA

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.809	4	.202	.148	.964[b]
	Residual	260.571	191	1.364		
	Total	261.380	195			

a. Dependent Variable: Residuals Squared

b. Predictors: (Constant), PRM Challenges, FIN Challenges, HRM Challenges, ICT Challenges

The Breusch-Pagan ANOVA produced an extremely low F-statistic of 0.148 with an associated p-value of 0.964, which is well above the conventional 0.05 significance threshold. This high p-value leads to a failure to reject the null hypothesis, indicating that there is no statistically significant evidence of heteroscedasticity in the regression model.

In other words, the variance of the residuals does not systematically change with the levels of the independent variables: human resource management (HRM) challenges, physical resource management (PRM) challenges, ICT challenges, and financial (FIN) challenges.

The confirmation of homoscedasticity implies that the residual variance is constant across the range of predictor values, satisfying one of the key assumptions of ordinary least squares regression. This strengthens the model's reliability, as unbiased and efficient estimates of the coefficients are ensured, and the standard errors are correctly specified. Consequently, hypothesis tests, confidence intervals, and other inferential procedures based on the regression results can be interpreted with confidence, supporting the validity of the findings regarding the effects of HRM, PRM, ICT, and financial challenges on CBE implementation.

4.4.3 Autocorrelation

To assess autocorrelation in the regression model, the Durbin-Watson statistic was computed. The obtained value of 2.084 falls within the conventional acceptable range of 1.5 to 2.5, suggesting no significant serial correlation among the residuals. A value close to 2 indicates that the residuals are independent of one another, meaning that the errors from one observation do not systematically influence the errors of subsequent observations.

This result confirms that the regression model satisfies the no-autocorrelation assumption, which is crucial for the validity of ordinary least squares estimates. The independence of residuals ensures that the standard errors of the coefficients are unbiased and that hypothesis tests, confidence intervals, and other inferential statistics derived from the model are reliable. Therefore, the regression results regarding the effects of human resource, physical resource, ICT, and financial management challenges on CBE

implementation can be interpreted with confidence, as they are not compromised by autocorrelation.

4.4.5 Multicollinearity

Multicollinearity in the regression model was assessed using both Variance Inflation Factors (VIFs) and Tolerance values for each predictor variable. The VIF coefficients for human resource management (HRM) challenges (1.291), ICT challenges (1.415), physical resource management (PRM) challenges (1.437), and financial (FIN) challenges (1.199) were all well below the conventional threshold of 10. This indicates that there is no substantial multicollinearity among the independent variables, meaning the predictors do not overlap excessively in the variance they explain. Similarly, the Tolerance values for all predictors exceeded the lower limit of 0.1, further confirming that none of the independent variables are highly collinear. This implies that each predictor contributes unique information to the regression model and that their individual effects on the dependent variable, the CBE Implementation Index, can be interpreted with confidence.

4.5 Discussion of Findings

4.5.1 The Impact of Human Resource Management Challenges on the Implementation of CBE

The regression analysis conducted in this study revealed that human resource management (HRM) challenges did not have a statistically significant effect on the implementation of the Competency-Based Education (CBE) in junior public schools in Baringo County, with a coefficient of B = 0.184 and a p-value of 0.217. While the positive coefficient could imply a potential relationship, the lack of statistical significance indicates that the traditional human resource factors, such as teacher qualifications, professional growth opportunities, induction, and continuous professional development, do not appear to exert a direct or substantial influence on the measured

CBE implementation outcomes in this context. In other words, despite acknowledged challenges in human resource management, these issues may not be the limiting factor in determining how effectively CBE is delivered in Baringo County junior schools.

This finding is somewhat unexpected when compared with the broader educational literature. Numerous studies have emphasised the pivotal role of HRM in ensuring effective curriculum implementation. For example, Mugabo et al. (2021) underscored that sustained teacher training, adequate professional development, and access to sufficient teaching resources are critical for effective CBE delivery in Rwanda. Similarly, Ramaditya (2023) found that human resource strategies in higher education institutions, including systematic staff training and investment in human capital, significantly influence the adoption and implementation of new curricula. These studies suggest that the availability of qualified personnel, continuous skill enhancement, and structured induction programs are instrumental in determining the success of curriculum reforms. In addition, Isaboke et al. (2021) and Momanyi and Rop (2019) highlighted the Kenyan context, emphasising that teachers face considerable challenges in implementing CBE due to inadequate training and limited exposure to learner-centred pedagogical methods. Such research portrays HRM as a central pillar for successful curriculum adoption and execution.

Several contextual factors can explain the apparent discrepancy between these studies and the findings from Baringo County. Firstly, although the HRM systems in place are limited, the government-provided training programs, while minimal, may provide enough foundational knowledge for teachers to navigate the basic requirements of CBE. These training sessions, even if brief, may equip teachers with the essential understanding of CBE principles, lesson structuring, and assessment strategies, enabling them to function competently within the curriculum framework. Secondly, the adaptive

capacity and resilience of teachers in Baringo County could play a crucial role. Many teachers may be compensating for HRM gaps by relying on experience-based instructional strategies, collaborating with peers, and improvising with available resources. Such adaptive behaviour can effectively neutralise potential deficits in formal training and professional development, thereby diminishing the observable statistical impact of HRM challenges in the regression model.

Furthermore, the finding indicates that HRM challenges, although present, may not always serve as a primary determinant of CBE implementation outcomes in contexts where other constraints, particularly financial limitations, are more pressing. For instance, financial constraints can directly affect the provision of teaching and learning materials, classroom infrastructure, and ICT tools, all of which are essential for operationalising CBE principles. In situations where financial or material resources are insufficient, the effects of HRM challenges might be overshadowed, making their statistical contribution to implementation outcomes less apparent.

This observation suggests a nuanced understanding of the role of HRM in curriculum implementation: while human resources are indispensable for long-term educational effectiveness, their immediate impact may be mediated by other institutional or contextual factors. The findings from Baringo County imply that even when teacher training is not ideal, and opportunities for continuous professional development are limited, CBE implementation can still progress, largely due to teacher adaptability, peer collaboration, and improvisational strategies.

Overall, the evidence from this study highlights that HRM challenges, while recognized and relevant, may not always act as the direct barrier to curriculum success, particularly in resource-constrained settings. This finding encourages policymakers and educational administrators to consider a holistic approach that not only addresses HRM issues but

also prioritises complementary factors such as financial resources, teaching materials, infrastructure, and school management practices to ensure the effective implementation of CBE. It also underscores the importance of teacher resilience and adaptability in contexts where formal HRM support is limited, offering a critical insight into how curriculum reforms can succeed even under less-than-ideal human resource conditions

4.5.2 The Impact of Physical Resource Management Challenges on the Implementation of CBE

The analysis revealed that physical resource management (PRM) challenges did not have a statistically significant impact on the implementation of Competency-Based Education (CBE) in junior public schools in Baringo County (B = 0.020, p = 0.888). This finding is particularly noteworthy given the extensive body of literature emphasising the critical role of physical resources, including classrooms, laboratories, textbooks, teaching aids, and general school infrastructure in shaping curriculum effectiveness. Kathuni et al. (2023), for instance, argued that inadequate physical resources and poorly maintained infrastructure represent significant obstacles to CBE implementation in public primary schools, directly affecting the quality of instruction and learning outcomes. Similarly, Ndayambaje (2018) observed in Rwanda that insufficient classroom space and learning materials significantly constrained CBE implementation, while Sidow (2022) noted that physical resource shortages can reduce student engagement and motivation, thereby negatively influencing learning processes.

Despite these well-documented challenges in other contexts, the regression analysis in Baringo County indicates no significant statistical relationship between PRM challenges and CBE implementation outcomes. A plausible explanation for this discrepancy lies in schools' contextual adaptation. In many cases, the lack of physical resources may have become normalised, prompting schools to adopt survival strategies that mitigate the

negative effects of infrastructural deficiencies. For example, teachers may employ innovative pedagogical methods, reusing available materials or developing low-cost instructional aids, while students may become accustomed to learning under resource-constrained conditions, thereby developing resilience and adaptability.

Additionally, the severity of physical resource shortages in Baringo County may not yet have reached a critical threshold that would substantially hinder curriculum delivery. Schools appear to maintain a minimum operational capacity to implement CBE, albeit in a constrained manner. Community interventions, including support from local organisations, parents, and the government, may further buffer the impact of resource shortages by providing supplementary learning materials, temporary facilities, or targeted infrastructure improvements. Such measures likely reduce the immediate effect of physical resource inadequacies on curriculum outcomes.

This finding suggests that, while physical resources are undeniably crucial for effective learning and teaching, they may not constitute the primary barrier to CBE implementation in this context. It highlights schools' and teachers' capacity to adapt to resource limitations through innovation, improvisation, and local support mechanisms. In the short term, these adaptive strategies allow schools to maintain curriculum delivery even under suboptimal infrastructural conditions.

4.5.3 How ICT Resource Management Challenges Affect Implementation of CBE

The regression analysis revealed that ICT resource management challenges had no statistically significant impact on the CBE Implementation Index in junior public schools in Baringo County ($B = 0.088$, $p = 0.625$). This indicates that constraints related to ICT, including limited access to computers, poor internet connectivity, and insufficient technical support, did not, at the time of the study, significantly affect the implementation of CBE. While ICT is widely acknowledged in the literature as a critical enabler of

learner-centred education, particularly in competency-based approaches, the findings in this context suggest that its influence is currently minimal.

This result contrasts with earlier studies, which underscore the pivotal role of ICT in modern curriculum delivery. Murithi and Yoo (2021) emphasised that adequate access to ICT facilitates student engagement and improves learning outcomes, asserting that the successful implementation of CBE is closely tied to the availability and use of technology. Similarly, Yildirim and Sensoy (2018) highlighted that integrating ICT in teaching enhances learning processes, fosters student engagement, and enables interactive, competency-focused instruction. Van Wijk (2021) also observed that ICT integration is critical to curriculum reform, particularly when learner-centred pedagogy is emphasised. These studies collectively suggest that without sufficient ICT infrastructure and support, the full potential of CBE cannot be realised.

The discrepancy in Baringo County may be explained by the region's early stage of ICT adoption. Many schools are still transitioning from traditional pedagogical methods, and ICT utilisation remains limited both in scope and frequency. Teachers may be reluctant to integrate technology due to insufficient professional development, lack of confidence in using digital tools, or inadequate exposure to ICT-based pedagogical strategies. Consequently, despite the recognised benefits of ICT in curriculum delivery, its current role in these schools is supplementary rather than transformative.

Moreover, the low significance could also reflect the gradual nature of ICT adoption. The schools may have recently initiated ICT integration processes, and as such, resource deficiencies have not yet translated into measurable deficits in CBE implementation. Teachers and learners may still rely predominantly on conventional instructional methods, mitigating the immediate impact of ICT scarcity on curriculum outcomes. However, as CBE increasingly emphasises digital literacy, continuous assessment, and

individualised learning, it is plausible that ICT challenges will become more pronounced over time, potentially exerting a more substantial influence on the success of curriculum implementation.

In summary, while ICT resources are recognised as fundamental to modern, learner-centred education, their current limited use in Baringo County means they are not yet a decisive factor in CBE implementation. This finding highlights the adaptive capacity of teachers and schools in implementing CBE despite infrastructural and technological constraints, while also signalling a need for progressive investment in ICT infrastructure, training, and support to ensure sustainable and effective adoption of the curriculum in the future.

4.5.4 How Financial Resource Management Challenges Affect the Implementation of CBE

The regression analysis demonstrated that financial resource management challenges exerted a strong and statistically significant negative effect on CBE implementation in junior schools in Baringo County ($B = -0.488$, $p = 0.021$). This indicates that as financial constraints increase, the level of CBE implementation decreases, highlighting the critical role of adequate funding in the successful execution of curriculum reforms. In contrast to human, physical, and ICT resource challenges, financial limitations appear to have a direct and measurable impact on the ability of schools to implement the Competency-Based Education effectively.

This finding aligns with a substantial body of literature emphasising the centrality of financial resources in educational reform. Ntumi et al. (2023) and Amunga et al. (2020) both underscore that insufficient funding is a primary barrier to effective curriculum implementation, restricting access to essential learning materials, infrastructure improvements, and teacher professional development programs. In Baringo County,

these financial constraints are particularly acute; schools often lack the capacity to procure the teaching and learning resources needed for CBE, thereby limiting their ability to meet the curriculum's competency-based objectives.

Supporting this observation, Obara (2019) highlighted that both national and county government allocations to schools in Baringo are insufficient, contributing to persistent challenges in acquiring materials and improving school facilities. Similarly, Waruingi et al. (2022) found that inadequate funding constrains school leadership from effectively adopting CBE, particularly in infrastructure development and teacher capacity building. These studies collectively emphasise that financial investment is not merely supportive but essential for operationalising CBE.

The negative relationship between financial challenges and CBE implementation in Baringo County implies that fiscal shortfalls directly undermine schools' capacity to implement curriculum reforms. Without adequate funding, schools cannot provide sufficient teaching and learning materials, improve classrooms or laboratories, or support continuous professional development for teachers. This lack of resources reduces the quality and effectiveness of teaching, compromises learner engagement, and ultimately diminishes the intended outcomes of the CBE framework.

Consequently, addressing financial resource constraints is imperative. Policy interventions should prioritise increased budgetary allocations for CBE implementation, ensure timely disbursement of funds, and promote effective financial management at the school level. By strengthening schools' financial capacity, Baringo County can enhance the provision of necessary materials, improve infrastructure, and support teacher training programs, thereby creating an enabling environment for the successful rollout and sustainability of Competency-Based Education.

4.6 Hypothesis Testing

4.6.1 There is no Statistically Significant Influence of Human Resource Management Challenges on the implementation of CBE in Junior Public Schools in Baringo County

The study sought to test the hypothesis that: **$H0_1$:** Human resource management challenges have no significant influence on the implementation of Competency-Based Education (CBE) in junior public schools in Baringo County. The analysis yielded a p-value of 0.217 for human resource management challenges, which is greater than the conventional significance threshold of 0.05. Consequently, the null hypothesis is not rejected, indicating that human resource management challenges do not significantly influence CBE implementation in the context of Baringo County.

This result implies that, although human resource issues such as teacher qualifications, professional development, and training opportunities exist, they do not appear to directly affect the measurable implementation of CBE in junior public schools. The positive regression coefficient (B = 0.184) suggests a potential relationship. Still, the lack of statistical significance indicates that any observed association may be due to random variation rather than a causal effect.

These findings diverge from those of Mugabo et al. (2021), who argued that sustained teacher training and adequate teaching resources are critical for the effective implementation of CBE in Rwanda. Similarly, Ramaditya (2023) emphasised that human resource strategies, including structured teacher training and professional development, are essential for curriculum implementation in higher education institutions. The divergence between these studies and the Baringo County context may be explained by the adaptive strategies that teachers in the county employ. For instance, teachers may

effectively leverage limited training and available resources by improvising instructional approaches to meet curriculum requirements.

Furthermore, the minimal training provided to teachers in Baringo County may nonetheless be sufficient to enable them to cope with the current demands of CBE, particularly at the junior school level, where curriculum expectations may be less complex than in higher education contexts. This finding highlights that while human resource management remains an essential component of curriculum delivery, it is not always the primary determinant of implementation success, especially in environments where financial resources, community support, and teacher adaptability may compensate for HR constraints.

4.6.2 There is no Statistically Significant Influence of Physical Resource Management Challenges on the implementation of CBE in Junior Public Schools in Baringo County

The study sought to test the hypothesis that: **$H0_2$:** Physical resource management challenges have no significant influence on the implementation of CBE in junior public schools in Baringo County. The analysis produced a p-value of 0.888 for physical resource management challenges, which exceeds the standard 0.05 significance threshold. Consequently, the null hypothesis is not rejected, indicating that physical resource management challenges do not have a statistically significant impact on CBE implementation in the study area.

This finding suggests that although physical resource constraints such as inadequate classrooms, limited learning materials, insufficient laboratory facilities, and a lack of teaching aids are present, they do not appear to determine the observed variations in CBE implementation directly. The regression coefficient (B = 0.020) was positive but

extremely small, further reinforcing the negligible influence of these physical constraints on curriculum outcomes at the junior school level in Baringo County.

These results contrast with previous studies that emphasise the critical role of physical infrastructure in effective curriculum delivery. For instance, Kathuni et al. (2023) highlighted that inadequate classrooms, laboratories, and teaching materials significantly hinder the deployment of CBE in public primary schools, thereby affecting both the quality of education and student learning outcomes. Similarly, Ndayambaje (2018) argued that insufficient physical resources compromise practical learning opportunities, reducing the effectiveness of CBE implementation in Rwanda. The apparent discrepancy between the literature and the Baringo County context may be explained by the adaptive strategies schools employ. Teachers may employ improvisation techniques, creatively use available learning materials, or rely on peer collaboration to overcome infrastructural limitations. Additionally, community involvement and targeted government interventions may help mitigate the effects of resource shortages, allowing schools to maintain a functional learning environment despite material constraints.

The study fails to reject the null hypothesis (H02), indicating that physical resource management challenges do not significantly influence CBE implementation in junior public schools in Baringo County. This outcome underscores the resilience and adaptability of schools in navigating resource limitations. It suggests that physical resource availability, while important, is not the most critical determinant of successful curriculum implementation in this context.

4.6.3 There is No Statistically Significant Influence of ICT Resource Management Challenges on the Implementation of CBE in Junior Public Schools in Baringo County

The study sought to test the hypothesis that: **$H0_3$:** ICT resource management challenges have no significant influence on the implementation of CBE in junior public schools in Baringo County. The analysis produced a p-value of 0.625 for ICT resource management challenges, which exceeds the 0.05 significance threshold. Consequently, the null hypothesis is not rejected, indicating that ICT resource management challenges do not have a statistically significant impact on CBE implementation in the study area.

This finding suggests that despite the presence of constraints such as limited computer access, poor internet connectivity, insufficient digital tools, and inadequate technical support, these factors do not substantially affect the variation in CBE implementation outcomes in Baringo County. The regression coefficient (B = 0.088) was positive but small, reflecting a minimal and statistically insignificant relationship between ICT challenges and curriculum delivery.

These results diverge from prior research emphasizing the critical role of ICT in facilitating learner-centered education. Murithi and Yoo (2021) argued that successful implementation of CBE depends on adequate access to ICT resources to support interactive learning and improve student engagement. Similarly, Yildirim and Sensoy (2018) found that integrating technology enhances learning processes and promotes active participation, while Van Wijk (2021) highlighted ICT as central to modern educational reforms and curriculum delivery.

The lack of significance in Baringo County may be explained by contextual factors. ICT adoption in the region remains at an early stage, with many schools still relying predominantly on traditional pedagogical methods. Teachers' limited exposure to digital

tools, low confidence in using technology, and insufficient professional development in ICT integration may reduce the immediate relevance of ICT challenges to CBE outcomes. Furthermore, the schools may have only recently begun incorporating ICT, meaning that their absence has not yet materially hindered curriculum implementation.

In conclusion, the study fails to reject the null hypothesis (H03), indicating that ICT resource management challenges do not significantly influence CBE implementation in junior public schools in Baringo County. This suggests that while ICT is a crucial element for long-term modernisation of education, its current limited integration does not yet constitute a decisive factor in shaping CBE implementation in this context

4.6.4 There is no Statistically Significant Influence of Financial Resource Management Challenges on the Implementation of CBE in Junior Public Schools in Baringo County

The study sought to test the hypothesis that: **$H0_4$:** Financial resource management challenges have no significant influence on the implementation of CBE in junior public schools in Baringo County. The analysis yielded a p-value of 0.021 for financial resource management challenges, which is below the 0.05 significance threshold. Consequently, the null hypothesis is rejected, indicating that financial resource management challenges significantly influence CBE implementation in the study area.

The negative regression coefficient (B = -0.488) suggests that as financial constraints increase, the level of CBE implementation decreases. This relationship reflects the reality that limited financial resources hinder schools from procuring essential teaching and learning materials, improving infrastructure, and supporting teacher professional development all critical components for successful curriculum delivery.

These findings align with previous studies emphasising the pivotal role of funding in educational reforms. Ntumi et al. (2023) and Amunga et al. (2020) highlighted that insufficient financial resources are a significant barrier to curriculum implementation, as they restrict access to instructional materials, infrastructure improvements, and teacher training initiatives. Similarly, Obara (2019) noted that in Baringo County, limited allocations from both national and county governments exacerbate the challenges of acquiring necessary CBE resources. Waruingi et al. (2022) also emphasised that principals' ability to implement CBE effectively is constrained by inadequate funding, particularly in terms of acquiring learning materials and supporting teacher training.

In Baringo County, the significant impact of financial resource constraints underscores the critical importance of sustained, adequate funding for effective CBE implementation. Without sufficient financial support, schools struggle to create conducive learning environments, provide necessary instructional resources, and ensure that teachers are adequately prepared. This finding underscores that financial management is a key determinant of successful CBE adoption. It suggests that interventions to increase budgetary allocations, mobilize community support, or leverage development partner resources are essential to improving curriculum outcomes.

The study rejects the null hypothesis (H04) and affirms that financial resource management challenges have a significant adverse effect on the implementation of CBE in junior public schools in Baringo County. Addressing these financial constraints is therefore crucial to ensuring the effective rollout and sustainability of the CBE framework in the county.

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CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

The chapter summarises the main results of the study, presents the conclusions based on the empirical study, and offers policy formulation and further research recommendations. It combines the findings of the regression analysis and additional statistical tests, thus explaining how human, physical, information, and communication technology (ICT), and financial resource management issues are relevant to the adoption of Competency Based Education (CBE) in the junior schools located in Baringo County. In the chapter, the implications of these findings are further evaluated, and strategic recommendations for improving CBE across the region are also provided.

5.2 Summary

5.2.1 Impact of Selected Human Resource Management Challenges on the Implementation of CBE in Public Junior Schools in Baringo County, Kenya

The study found that human resource management challenges significantly influence the implementation of Competency-Based Education (CBE) in public junior schools in Baringo County. Inadequate teacher preparedness emerged as a significant constraint, with many respondents reporting insufficient training in CBE methodologies. Induction programs were found to be unsatisfactory, limiting teachers' practical readiness to apply learner-centred instructional strategies.

Resistance to change also surfaced as a critical factor, with some teachers reluctant to shift from traditional content-driven approaches. This attitudinal challenge hinders the adoption of CBE principles and slows the transition toward innovative instructional practices. Additionally, opportunities for Continuous Professional Development (CPD)

were reported to be limited, restricting teachers' ability to update their skills and align their teaching methods with evolving CBE demands.

The study further found that shortages in support staff and ineffective recruitment strategies contributed to challenges in deploying and retaining qualified personnel. Weak feedback mechanisms and communication gaps between teachers and policymakers were also evident, creating a disconnect between curriculum expectations and classroom realities. Such gaps diminish instructional quality and reduce teachers' responsiveness to emerging pedagogical challenges.

High teacher workload was widely reported, encompassing lesson planning, assessment, and the hands-on activities required under CBE. This workload negatively affects teacher motivation, efficiency, and job satisfaction, ultimately influencing the quality of learning outcomes. Collectively, the findings indicate that human resource management challenges including deficiencies in training, CPD, recruitment, communication, and workload interact in a compounded manner to shape the success of CBE implementation in junior schools. This underscores the need for a comprehensive and well-coordinated human resource strategy.

5.2.2 Impact of Selected Physical Resource Management Challenges on the Implementation of CBE in Public Junior Schools in Baringo County, Kenya

The study found that physical resource management challenges significantly constrain the effective implementation of CBE. Respondents reported that inadequate classroom space leads to overcrowding, undermining learner-centred teaching and limiting individual learner engagement. Laboratories, libraries, and outdoor learning spaces were either insufficient or completely absent, restricting practical and inquiry-based learning an essential component of the skills-oriented approach emphasised in CBE.

Textbook shortages and limited teaching aids, including charts, models, and visual materials, were identified as significant obstacles to participatory learning. Students often share scarce resources, creating inequities in access and hindering the standardisation of learning experiences. Shortages of classroom furniture, such as desks and chairs, further compromise learner comfort, concentration, and overall classroom management. Collectively, these gaps reflect systemic deficiencies that directly affect the quality of pedagogy and the overall learning environment.

Limited electricity connectivity also emerged as a significant challenge, constraining the integration of ICT, which is increasingly essential for contemporary CBE pedagogy. This limitation reduces the feasibility of using digital and interactive instructional methods. Although some schools have attempted to mitigate these constraints through improvised strategies such as resource rotation or community support, such measures remain inadequate to meet curricular requirements.

Overall, the study indicates that physical resource inadequacies create structural barriers to the holistic delivery of CBE. These constraints affect not only cognitive and practical learning but also co-curricular and experiential activities. Addressing these systemic challenges is critical to ensuring that learners can fully benefit from the intended outcomes of competency-based education in Baringo County.

5.2.3 Impact of Selected ICT Resource Management Challenges on the Implementation of CBE in Public Junior Schools in Baringo County, Kenya

The study found that ICT resource challenges significantly impede the effective integration of technology in CBE implementation. Respondents highlighted inadequate internet connectivity, limited access to personal computing devices, and insufficient numbers of projectors and cameras, all of which are essential for interactive, learner-centred instructional practices. These deficiencies reduce the potential of digital tools to

support competency development and hinder the use of technologically enhanced teaching methods.

Technical support and maintenance systems were also found to be weak, resulting in poor sustainability and underutilization of available ICT resources. Many schools lack reliable repair mechanisms, and existing equipment is often left unused due to frequent breakdowns and the absence of timely servicing. Teacher capacity to integrate ICT into instruction was reported to be inadequate, with limited professional development opportunities to strengthen digital pedagogical skills. This gap restricts teachers' ability to use technology effectively to enhance learner engagement and facilitate the acquisition of competencies.

The study further revealed that even in schools with ICT facilities, the absence of trained personnel to manage and maintain these tools compromises their functionality. As a result, ICT resources remain underutilised, and the intended innovations of CBE—such as interactive learning, simulations, and project-based activities—are significantly constrained.

Overall, the findings indicate that ICT challenges are both infrastructural and capacity-related. The shortage of devices, weak connectivity, limited technical support, and insufficient teacher training collectively hinder the digital transformation required for effective CBE delivery. Without targeted investment in ICT infrastructure and sustained professional development, the full potential of technology-enhanced competency-based education cannot be realised in Baringo County.

5.3.4 Impact of Selected Financial Resource Management Challenges on the Implementation of CBE in Public Junior Schools in Baringo County

The study found that financial resource management challenges represent a major barrier to the effective implementation of CBE. Respondents reported inconsistencies in procurement processes, weak auditing practices, and limited oversight, all of which compromise transparency and accountability. Budgeting procedures and inventory management were also found to be inadequate, creating risks of wastage, misallocation of funds, and delays in acquiring essential learning materials.

Government funding was described as insufficient and frequently delayed, limiting schools' capacity to meet the dynamic requirements of CBE implementation. Limited financial flexibility and poor cash flow management further compounded operational inefficiencies, while debt accumulation without structured repayment plans posed risks to long-term institutional sustainability. These findings reflect systemic vulnerabilities in school financial management that impede effective curriculum delivery.

Procurement inefficiencies and recurring instances of inadequate resource allocation point to structural weaknesses that hinder the timely provision of CBE materials. Weak financial oversight also reduces schools' ability to optimise the use of available resources and to adapt to emerging curriculum needs, ultimately undermining the potential for successful CBE outcomes.

Overall, the study indicates that financial resource management challenges are multifaceted, affecting not only the availability and utilisation of learning resources but also overall organisational capacity and sustainability. Strengthening budgeting, procurement, auditing, and cash flow management processes is essential to ensure that CBE can be effectively implemented and sustained in public junior schools in Baringo County.

5.3 Conclusions

This study has resulted in three main conclusions regarding the influence of financial, physical, and ICT resource management challenges on the implementation of Competency-Based Education (CBE) in public junior schools in Baringo County.

Firstly, the study concludes that financial resource management challenges significantly undermine the effective implementation of CBE. The findings showed that procurement processes were inconsistent, budgeting procedures were weak, and auditing mechanisms were inadequate. These shortcomings led to delays in acquiring essential teaching and learning materials, reduced transparency in financial decisions, and increased the risk of resource misallocation. Furthermore, insufficient and delayed government funding created persistent cash flow constraints, limiting schools' ability to meet curriculum needs on time and to engage in strategic planning. As a result, schools struggled to sustain essential CBE activities, indicating that weak financial management structures directly hinder the effectiveness and continuity of the competency-based curriculum.

Secondly, the study concludes that physical resource inadequacies create structural barriers that significantly affect CBE delivery. Shortages of classrooms, laboratories, libraries, and outdoor learning spaces were found to restrict learner engagement, practical activities, and inquiry-based learning, all of which are central to the competency-based approach. Insufficient teaching aids, inadequate seating, and overcrowded classrooms further limited teachers' ability to apply learner-centred pedagogies. Additionally, unreliable electricity and a lack of essential facilities diminished opportunities for experiential and ICT-supported learning. These findings demonstrate that the successful implementation of CBE is closely tied to the availability, adequacy, and accessibility of physical infrastructure.

Thirdly, the study concludes that ICT resource challenges remain a significant impediment to the digital transformation required for effective CBE implementation. Limited internet connectivity, inadequate computing devices, and insufficient digital learning tools were found across many schools. Weak technical support systems and the absence of regular maintenance further reduced the sustainability and usability of available ICT equipment. Moreover, limited teacher capacity for ICT integration restricted the use of digital tools to facilitate learner-centred, interactive, and self-directed learning. Consequently, ICT adoption in many schools remains largely aspirational, limiting learners' opportunities to acquire essential digital competencies required in the contemporary educational environment.

Taken together, these conclusions indicate that financial, physical, and ICT resource management challenges collectively pose systemic barriers to the successful implementation of Competency-Based Education in public junior schools in Baringo County. Weak procurement, irregular auditing, poor budgeting, inadequate infrastructure, and limited digital capacity create inefficiencies that compromise both operational effectiveness and pedagogical quality. Addressing these challenges requires a comprehensive and integrated strategy that enhances institutional governance, strengthens financial and resource management capacity, ensures timely and adequate funding, and expands investment in physical and ICT infrastructure. Only through coordinated interventions can schools achieve sustainable, effective CBE implementation and ensure that learners fully benefit from practical, participatory, and competency-focused learning experiences.

5.4 Recommendations

The study recommends that urgent and coordinated interventions be undertaken to address human resource management challenges in the implementation of Competency-

Based Education (CBE). Specifically, government bodies and education stakeholders should prioritise large-scale training and retraining programs that equip teachers with up-to-date CBE methodologies. Structured induction programs for newly recruited staff are essential to ensure they understand CBE's philosophy and practical requirements from the outset. Continuous professional development should be institutionalised as a policy, enabling teachers to regularly upgrade their skills in response to evolving pedagogical standards. Additionally, strategic recruitment efforts should focus on attracting and retaining highly competent teachers while expanding the support workforce, such as teacher aides and administrative assistants, to reduce the overall burden on classroom teachers. Establishing mechanisms for regular feedback, coupled with enhanced communication channels between teachers and policymakers, will help bridge the persistent policy-practice gap, ensuring that reforms are both practical and contextually relevant.

Rationalising teacher workloads through task redistribution, recruitment, and adoption of workload-friendly pedagogical approaches is also recommended to enhance instructional quality and reduce burnout. To mitigate physical resource constraints, the study recommends a significant, sustained investment in school infrastructure by both the government and local stakeholders. Construction of additional classrooms, laboratories, and libraries should be prioritised to address overcrowding and promote conducive learning environments. Schools should be adequately equipped with essential teaching aids, desks, chairs, textbooks, and other instructional materials to ensure equitable access to quality education. Expanding outdoor and co-curricular learning facilities is equally important to foster experiential learning, creativity, and holistic development, all of which are central to CBE. Reliable electricity supply across all junior schools is critical, particularly for integrating ICT into daily teaching practices. Ensuring the timely

provision and maintenance of these physical resources will not only improve the learning environment but also enable teachers to implement CBE strategies more effectively and consistently.

Regarding ICT integration, the study recommends strengthening technological infrastructure across junior schools to support effective CBE delivery. This includes expanding internet connectivity and providing schools with sufficient laptops, desktops, tablets, projectors, and cameras. Equally important is the development of reliable ICT maintenance systems and the recruitment or training of technical support staff to provide prompt assistance, minimising downtime that can disrupt teaching and learning. Teachers should receive continuous professional development focused on ICT skills and on integrating digital tools into pedagogy, enabling them to leverage technology to enhance learner-centred teaching, assessment, and collaboration. Tailoring these training programs to emerging technological trends will enable schools to remain adaptive, fostering a culture in which digital learning is seamlessly integrated into CBE methodologies and supports improved learning outcomes.

On financial resource management, the study recommends rigorous enforcement of procurement regulations and strengthening of auditing processes to enhance accountability and transparency in resource allocation. Schools should be supported in adopting structured budgeting practices and robust inventory management systems to reduce wastage and ensure equitable distribution of resources aligned with CBE priorities. Government authorities should ensure the timely and increased disbursement of funds, enabling schools to acquire essential resources promptly and respond effectively to CBE needs. In addition, cost-control measures, asset management systems, and debt management frameworks should be enforced to promote financial sustainability. By strengthening economic governance and oversight, schools will be better positioned

to ensure that resources are not only available but also utilised efficiently, thereby supporting the full realisation of CBE objectives and improving the overall quality of education.

5.4.1 Policy Recommendations

Based on the findings of this study, several policy considerations both enhancements to existing policies and the formulation of new ones are necessary to strengthen the implementation of Competency-Based Education (CBE) in public junior schools.

Firstly, existing education policies require enhancement to provide more straightforward, more comprehensive guidelines for CBE implementation. While CBE has been formally adopted at the national level, gaps remain in the operational directives provided to schools regarding curriculum delivery, assessment procedures, and teacher preparation. Strengthening these existing policies by developing detailed implementation manuals, standardised assessment frameworks, and structured teacher induction guidelines would support consistency and improve instructional effectiveness across schools.

Secondly, there is a need to formulate new policies that establish sustainable and continuous teacher professional development for CBE. Current policy provisions on teacher training do not adequately address ongoing capacity-building needs. A dedicated national CPD policy that focuses on regular refresher training, mentorship programs, school-based coaching, and targeted capacity-building for new teachers would ensure educators remain well-equipped with evolving CBE methodologies and learner-centred pedagogical approaches.

Thirdly, policies should be formulated or strengthened to ensure adequate provision of financial, physical, and ICT resources necessary for CBE implementation. While resource allocation is addressed in existing education financing policies, these policies

remain insufficient and inconsistent to meet the demands of CBE. A policy framework guaranteeing minimum resource standards such as classroom space, teaching materials, laboratory facilities, ICT infrastructure, and co-curricular equipment should be established. Incorporating a resource adequacy benchmark into school funding policy would help ensure equitable and predictable distribution of materials required for competency development.

Fourthly, existing policies on accountability, school management, and financial oversight require reinforcement to improve transparency and efficiency in CBE implementation. Strengthening policies related to procurement procedures, financial audits, budgeting processes, and performance monitoring would support better resource utilisation. In particular, establishing precise reporting mechanisms and school-level feedback systems within policy frameworks would enable timely responses to emerging challenges and promote alignment with national education objectives.

Finally, practical interventions should be embedded within these policy considerations to ensure effective implementation. These include:

- introducing policy-backed digital maintenance schedules and ICT support units at the school or sub-county level, formalising community–school partnerships to support infrastructure development, integrating school-level CBE implementation committees within governance policies, and mandating structured monitoring visits focused specifically on CBE progress indicators.

5.4.2 Suggestion for Further Studies

Future studies could explore the roles of community participation and parental involvement in supporting the implementation of Competency-Based Education (CBE) in junior schools. Researchers may also investigate the long-term impact of teacher

professional development initiatives on improving CBE delivery and learner outcomes. Additionally, comparative studies across different countries could provide insights into regional disparities and best practices in addressing resource management challenges for CBE implementation

REFERENCES

Amunga, J., Were, D., & Ashioya, I. (2020). The Teacher-Parent Nexus in the Competency Based Curriculum Success Equation in Kenya. *International Journal of Educational Administration and Policy Studies*, 60–76.

Bessong, R., & Ogina, T. (2022). Teachers as curriculum leaders in secondary schools in the Vhembe district, South Africa. *South African Journal of Education*, 42.

Brazier, J., Briggs, A., & Bryan, S. (2018). EQ-5D-5L: Smaller steps but a major step change? Health Economics. 363-364.

Cheptoo, R., & Ramadas, V. (2019). The "Africanized" Competency-Based Education: The Twenty-First Century Strides. *Shanlax International Journal of Education, 7*(4), 46-51. https://doi.org/10.34293/education.v7i4.640

Cheruiyot, B. (2024). Challenges faced in the implementation of Competency-Based Education(CBE) in junior schools in Kenya. *East African Journal of Education Studies, 7*(3), 260-266. https://doi.org/10.37284/eajes.7.3.2098

Cohen, L., Manion, L., & Morrison, K. (2017). Validity and reliability. Kwenye L. Cohen, L. Manion, & K. Morrison, *Research Methods in Education* (Tol. la 8.). London: Routledge. https://doi.org/10.4324/9781315456539

Colagrossi, M. (2018). *www.weforum.org:* . 10-reasons-why-finlands-education-system-is-the-best-in-the-world:https://www.weforum.org/agenda/2018/09/

County Government of Baringo. (2025). *Who we are.* https://baringo.go.ke/who-we-are/

Darling-Hammond, L., Burns, D., Campbell, C., Goodwin, A. L., Hammerness, K., Low, E.-L., McIntyre, A., Sato, M., & Zeichner, K. (2017). *Empowered Educators: How High-Performing Systems Shape Teaching Quality Around the World.* John Wiley & Sons.

Dubey, U. K., & Kothari, D. P. (2019). *Research methodology: techniques and trends.* Boca Raton: Chapman and Hall/CRC. https://doi.org/10.1201/9781315167138

Dusabimana, J., & Mugabo, L. R. (2022). Physics Teachers' Implementation of Competence-Based Curriculum through the Use of Inquiry-Based Teaching and Learning: A Case of Lower Secondary Schools in Gakenke District. *African Journal of Educational Studies*.

Einola, K., & Alvesson, M. (2021). The perils of authentic leadership theory. Leadership. 483-490.

Fabito, B. S., Trillanes, A. O., & Sarmiento, J. R. (2022). Barriers and Challenges of Computing Students in an Online Learning Environment: Insights from One Private University in the Philippines.

Gulled, Y. M. (2023). Paradigms for contextualising competency-based curriculum in Africa: inferences from the OECD countries. *Education Quarterly Reviews, 6*(1). SSRN: https://ssrn.com/abstract=4380557

Hellwig, S. (2006). Competency-based training: different perceptions in Australia and Germany. *Australian Journal of Adult Learning, 46*(1).

Hertzog, M. A. (2008). Considerations in determining sample size for pilot studies. *Research in Nursing & Health, 31*(2), 180-191. https://doi.org/10.1002/nur.20247

Isaboke, H., Mweru, M., & Wambiri, G. (2021). Teacher Preparedness and Implementation of the Competency-Based Curriculum in Public Pre-Primary Schools in Nairobi City County, Kenya. *International Journal of Current Aspects*, 32-53.

Julious, S. A. (2005). Sample size of 12 per group is the rule of thumb for a pilot study. *Pharmaceutical Statistics, 4*(4), 287-291. https://doi.org/10.1002/pst.185

Kathuni, E. P., Mwenda, E. E., Kirugua, J. M., & Mbaka, P. K. (2023). Adequacy Of Physical Resources And Effective Implementation Of Competence-Based Curriculum In Tharaka Nithi County, Kenya. Country:.

Kellie, S. (2019). Competency-based learning in higher education.

Kenya Institute of Curriculum Development. (2016). *Needs assessment reports for CBE: Kenya Institute of Curriculum Development.* Kenya Institute of Curriculum Development. https://kicd.ac.ke/curriculum-reform/need-assessment-reports-for-CBE/

Kenya National Bureau of Statistics. (2015). *County Statistical Abstract, Baringo County.* Kenya National Bureau of Statistics. https://www.knbs.or.ke/wp-content/uploads/2023/09/2015-County-Statistical-Abstracts-Baringo.pdf

Kenya Yearbook Editorial Board. (2022). Education-CBE implementation status. https://yearbook.kenyayearbook.go.ke/2022/03/31/education-CBE-implementation-status/

Kerosi, G., & Olando, S. (2021). *Access to education and health among minority and indigenous communities in Kenya: Assessment of Baringo, Trans-Nzoia, Elgeyo Marakwet and Turkana Counties.* Minority Rights Group.

KICD. (2017). *Basic Education Curriculum Framework.* Kenya Institute of Curriculum Development. https://kicd.ac.ke/wp-content/uploads/2017/ 10/CURRICUL UM FRAMEWORK.pdf

KICD. (2019). *Basic Education Curriculum Framework.* Kenya Institute of Curriculum Development.

Kidega, C., Song, Z., Ugochinyere, I. C., James, O. A., & Ndikubwimana, F. (2024). Confronting Challenges Facing Teachers in Implementing Competency-Based Educationin Uganda: A Case of Secondary Schools in Gulu City. *East African Journal of Education Studies, 7*(2), 112-129. https://doi.or g/10.3728 4/eajes.7.2.1891

Klein, E. D., & Schwanenberg, J. (2020). Ready to lead school improvement? Perceived professional development needs of principals in Germany. Educational Management Administration & Leadership.

Koech, F. (2021). *Nation Media Group.* https://nation.africa/kenya/news/education/CBE-rollout-no-easy-walk-for-remote-schools-in-the-north-3555936

Komba, S. C., & Mwandaji, M. (2015). Reflections on the Implementation of Competence-Based Curriculum in Tanzanian Secondary Schools. *Journal of Education and Learning, 4*(2), 73-80. https://doi.org/10.5539/jel.v4n2p73

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 607–610.

Likisa, K. D. (2018). Challenges and Prospects of Competency-Based Education: The Case of Adama Science and Technology University Alumni Students and Hawas TVET College, Adama, Ethiopia. *The Journal of Competency-Based Education*, 1-7.

Majdi, S., & Suleman, A. (2023). The effect of the infographic display style on learning and retaining the vocabulary of the Noble Quran. *Journal of Education and Learning*, 136-144.

Manduku, J., & Sang, H. (2021). Innovative pedagogies in competency-based learning: A critical analysis of the traditional and the CBE curriculum. *International Journal of Research In Education And Psychology, 7*(2), 1-11. http://ir-library. kabianga.ac.ke/ handle/123456789/345

Marishane, R. N. (2020). Contextual intelligence in school leadership: responding to the dynamics of change. Boston: Brill.

Mathias, L., Mwamakula, F., & Mhagama, M. (2023). Challenges facing Public Secondary School Teachers on Implementing Competence-Based Curriculum in Magu District. Zenodo.

Misko, J. (1999). *Competency-based training.* National Centre for Vocational Education Research Ltd. https://www.ncver.edu.au /_data/assets/ file/001 7/662 3/td_t nc_60_ 02.pdf

Momanyi, J. M., & Rop, P. K. (2019). Teacher preparedness for the implementation of Competency-Based Education in Kenya: A survey of early grade primary school teachers in Bomet East Sub-County. The Cradle of Knowledge:. *African Journal of Educational and Social Science Research*.

Muchira, J. M., Morris, R. J., Wawire, B. A., & Oh, C. (2023). Implementing Competency-Based Curriculum (CBE) in Kenya: challenges and lessons from South Korea and the USA. *Journal of Education and Learning, 12*(3), 62. https://doi.org/10.5539/jel.v12n3p62

Mugabo, L., Ozawa, H., & Nkundabakura, P. (2021). Science Competence-based Curriculum Implementation in Rwanda: A Multiple Case Study of the Relationship between a School's Profile of Implementation and its Capacity to Innovate. *African Journal of Research in Education*.

Mugenda, O. M., & Mugenda, A. G. (2003). *Research methods: quantitative and qualitative approaches*. African Centre for Technology Studies.

Mulenga, I. M., & Kabombwe, Y. M. (2019). Understanding a Competency-Based Education: The Zambian Perspective.

Murithi, J., & Yoo, J. E. (2021). Teachers' use of ICT in implementing the Competency-Based Education in Kenyan public primary schools. *Innovation and Education*, 1-11.

Mustafa, A. N. (2023). Reflection on the latest PISA results of Indonesia. *International Journal of Advanced Research*, 1223-1228.

Mwita, E., & Onyango, J. (2022). Availability and use of instructional resources on the implementation of the Competency-Based Education by grades 1, 2, and 3 in public primary schools in Migori County, Kenya. *Journal of Advances in Education and Psychology*.

Nawzad, L., Rahim, D., & Wakil, K. (2018). The effectiveness of technology for improving the teaching of natural science subjects. *Indonesian Journal of Curriculum and Educational Technology Studies, 6*(1), 15-21. https://doi.org /10.15294/ijcets.v3i1.8675

Ndayambaje, I. (2018). Implementing CBE: Successes and Challenges. Rwanda Education Board.

Nguyen, T. A., Le, T. T., Vang, M. D., Phuong, Y. H., Huynh, T. T., Nguyen, T. H., & Pham, T. T. (2024). Vietnamese EFL high school teachers' perceptions of difficulties when implementing competency-based English teaching curriculum and their proposed solutions. *Forum for Linguistic Studies, 5*(2), 1863. https://doi.org/10.59400/FLS.v5i2.1863

Ntumi, S., Agbenyo, S., Tetteh, A., Ebow Yalley, C., Yeboah, A., & D, G. N. (2023). Teacher preparedness and implementation of the national pre-tertiary education curriculum framework in Ghana. *Journal of Educational Research and Practice*, 251.

Nzarirwehi, J., & Atuhumuze, F. (2019). In-Service Teacher Training and Professional Development of Primary School Teachers in Uganda. *IAFOR Journal of Education, 7*(1), 19-36. https://eric.ed.gov/?id=EJ1217948

Obara, D. O. (2019). *Influence Of County Government Financing On Access To Pre-Primary Education In Baringo Central Sub-County, Baringo County, Kenya.* Thesis, University of Nairobi. http://erepository.uo nbi.ac.ke/h andle/ 1129 5/107415

Odero, R. A., Achieng, A. L., & Munyua, J. (2021). Psychosocial Factors on Academic Performance of Girls in Public Primary Schools in Kisumu Central Sub-County, Kisumu County, Kenya. *Journal of African Interdisciplinary Studies*, 4 – 16.

Omboto, C. M., Kanga, A., & Njageh, A. R. (2022). Myth or Reality: Digital Literacy Programme Implementation in Primary Special Schools in Nairobi, Kenya. *European Journal of Education*, 51-66.

Patel, M., & Patel, N. (2019). Exploring Research Methodology: Review Article. *International Journal of Research and Review*, 48–55.

Ramaditya, M., Agustian, S. E., & Burda. (2023). Survival and human resource strategies of private higher education in facing an era of change: Insights from Indonesia. *Frontiers in Education*.

Rivas, A. (2021). Introductory Study: A Comparative Analysis of Educational Reforms in Latin America. Kwenye A. Rivas (Mhar.), *Examining Educational Policy in Latin America* (Tol. la 1st.). New York: Routledge. https://doi.or g/10.43 24/978 1003225782

Rude, H., & Miller, K. J. (2018). Policy challenges and opportunities for rural special education. *Rural Special Education Quarterly, 37*(1), 21-29. https://doi. org/10. 1177/8756870517748662

Salman, Y., & Broten, N. (2017). *An analysis of John P. Kotter's leading change.* London: Macat Library. https://doi.org/10.4324/9781912281022

Sidow, M. I. (2022). Factors affecting the implementation of the Competency-Based Education in public secondary schools in Mogadishu, Somalia: a multiple regression analysis. *EPRA International Journal of Environmental Economics, Commerce and Education*, 1-10.

Siedlecki, S. L. (2020). Understanding descriptive research designs and methods. Clinical Nurse Specialist CNS. 8-12.

Sileyew, J. K. (2020). Research Design and Methodology. Semantic Scholar, Cyberspace. .

Sirili, N., Kilonzi, M., Mwakawanga, D. L., Mohamedi, J. A., Thobias, J. M., Clement, A., Mwasomola, D., & Mushy, S. E. (2023). Awareness, Actions, and Predictors of Actions on Adverse Drug Reaction Reporting among Patients Attending a Referral Hospital in Southern Highland Tanzania.

Sitenei, C. (2020). School-Based Factors Influencing Implementation of CBE in Public Primary Schools In Kibera Sub-County, Nairobi City County, Kenya (Unpublished Master's Project). University Of Nairobi, Kenya.

Too, B. C., Kipkoech, L., & Keter, J. (2024). Level of Infrastructure and Resource Preparedness in the Implementation of Competency-Based Education in Public Primary Schools in Baringo County, Kenya. *Journal of Research Innovation and Implications in Education, 8*(3), 437 – 445. https://doi.org/10.59765/pdcbr3947

Uljens, M., Ylimaki, R. M., Huber, S., Tulowitzki, P., & Hameyer, U. (2017). Curriculum and School Leadership – Adjusting School Leadership to Curriculum. Kwenye *Bridging Educational Leadership, Curriculum Theory and Didaktik* (Juzuu 5, kur. 309-332). Cham: Springer International Publishing. https://doi.org/10 .1007/978-3-319-58650-2_9

UNICEF & the African Union Commission. (2020). *Transforming education in Africa: An evidence-based overview and recommendations for long-term improvements.* https://www.unicef.org/media/106691/file#page=7.11

Urunana. (2018). *Implementing CBE: Successes and challenges.* Kigali: Urunanarw abarez i..: https://Rwanda.vvb.be/publications

Van Wyk, B. (2021). Lecturers' readiness as a factor in the uptake of teaching with digital technologies in distance learning: A Zambian case study. digiTAL. 36.

Wambiya, P., & Ogula, P. (2023). The Effectiveness of the Competence-based Curriculum (CBE) Adoption and Implementation in Primary and Secondary Schools in East African Community (EAC) Countries. *3*(1). https://eajourna lesshresearch .org/index.php/ojs-files/article/view/15

Wambua, M., & Waweru, S. (2019). Constraints Facing Successful Implementation of the Competency-Based Education in Kenya. *American Journal of Educational Research*, 943-947.

Wang, T. (2024). The impact of female education on fertility: evidence from Malawi Universal Primary Education program. *Journal of Demographic Economics*, 1-29. https://doi.org/10.1017/dem.2024.3

Waruingi, A. W., Mbogo, R., & Mambo, A. (2022). Assessment of challenges faced by principals in the implementation of the Competency-Based Education in public primary schools in Kenya: A case of Kiambu County. *Journal of Education*, 26-39.

Yildirim, H. I., & Sensoy, O. (2018). Effect of Science Teaching Enriched with Technological Practices on Attitudes of Secondary School 7th Grade Students towards Science Course. *Universal Journal of Educational Research*, 947-959.

APPENDICES

Appendix I: Questionnaire for Teachers

The purpose of this questionnaire is to collect data about the management hurdles involving the application of the Competency-Based Curriculum (CBE) in the public junior schools of Baringo County. We kindly ask you to participate by completing this questionnaire voluntarily. Your responses will remain confidential. Please do your best to answer each of the questions honestly and accurately. You should NOT write your name on the questionnaire.

Section B: Selected Human Resource Management Challenges

Using the scale below, rate your agreement with the following statements:

Key: SA=Strongly Agree; A=Agree; N= Neutral; D=Disagree and SD=Strongly Disagree

Statement	**SA**	**A**	**D**	SD
There are inadequate, qualified teachers trained in the CBE curriculum.				
There is resistance to change among junior school teachers regarding the CBE curriculum.				
Continuous professional development programs are not provided for junior school teachers.				
Support staff is inadequate for effective CBE implementation.				
Effective recruitment strategies are not in place for junior school teachers.				
Junior school teachers are not adequately inducted for CBE.				
Teachers are not adequately trained in CBE pedagogies.				
Regular feedback to teachers is not provided for improving the CBE curriculum.				
There is little communication between teachers and policymakers.				
Teacher workload is not manageable under CBE.				

Section C: Selected Physical Resource Management Challenges

Using the scale below, rate your agreement with the following statements:

Key: SA=Strongly Agree; A=Agree; N= Neutral D=Disagree and SD=Strongly Agree

Statement	SA	**A**	**D**	**SD**
There are inadequate classrooms for CBE in junior schools.				
There are a few laboratories to support CBE activities.				
There are no libraries available for CBE in junior schools.				
Textbooks for CBE are insufficient.				
Teaching aids for CBE are inadequate.				
Desks for CBE are inadequate.				
There is insufficient playground space for CBE's practical learning activities.				
Chairs for CBE are inadequate.				
Electricity connectivity for CBE is lacking.				

Section D: Selected ICT Resource Management Challenges

Using the scale below, rate your agreement with the following statements:

Key: SA=Strongly Agree; A=Agree; N= Neutral; A=Disagree and SD=Strongly Disagree

Statement	**SA**	**A**	**D**	**SD**
Internet connectivity for CBE is inadequate.				
Laptops for CBE lessons are lacking.				
Projectors for CBE lessons are lacking.				
Cameras for CBE students are inadequate.				
Technical support for maintaining school devices is lacking.				
Teachers are not adequately trained to integrate ICT into CBE teaching.				
There is no reliable system in place for repairing and maintaining ICT resources.				
Desktops for CBE students are inadequate.				
Smartphones for CBE students are lacking.				
Tablets for CBE students are inadequate.				
iPads for CBE students are lacking				

Section E: Selected Financial Resource Management Challenges

Using the scale below, rate your agreement with the following statements:

Key: SA=Strongly Agree; A=Agree; N= Neutral; A=Disagree and SD=Strongly Disagree

Statement	**SA**	**A**	**D**	**SD**
The procurement rules in our school are not followed.				
Auditing practices are not conducted regularly.				
Budgeting practices are not well done.				
School inventory is not well managed.				
Funds allocated for CBE implementation are insufficient.				
Funds for CBE resources are not disbursed on time.				
Financial resources are not well-managed to address emerging needs in CBE.				
Cash flow in our school is not adequate.				
Cost control in our school is not well managed.				
Asset management in our school is not well done.				
Expenses management in our school is not well-controlled.				
Debt management in our school is not well done.				
The procurement rules in our school are not followed.				

Appendix II: Questionnaire for Principals

The purpose of this questionnaire is to collect data about the management hurdles involving the application of the Competency Based Curriculum (CBE) in the public junior schools of Baringo County. We kindly ask you to participate by completing this questionnaire voluntarily. Your responses will remain confidential. Please do your best to answer each of the questions honestly and accurately. You should NOT write your name on the questionnaire.

Thank you for your time and assistance.

Section A: Demographic Information

Please indicate the appropriate response by ticking (√) in the provided boxes.

1. Gender

   Male ( ) Female ( )

2. Age group

   26 – 30 yrs. ( ) 31 – 35 yrs. ( ) 36 – 40 yrs. ( )

   41 – 45 yrs. ( ) 46 – 50 yrs. ( )

3. Highest Academic Qualification

   Diploma ( ) Bachelors ( ) Masters ( )

   Others(specify) _____

4. Years of Teaching Experience

   Less than 5 yrs. ( ) 6 – 10 yrs. ( ) 11 – 15 yrs. ( )

   16 – 20 yrs. ( ) 20 yrs. and Above ( )

Section B: Impact of Selected Human Resource Management Challenges on the Implementation of CBE in Public Junior School in Baringo County, Kenya

1. What is the impact of inadequate qualified teachers trained in the CBE curriculum in your school?

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2. What is the impact of inadequate support staff in CBE implementation in your school?

---

3. What is the impact of little communication between teachers and policymakers in your school?

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4. What is the impact of teachers not being adequately trained in CBE pedagogies in your school?

---

5. What is the impact of not providing regular feedback to teachers on the CBE curriculum in your school?

---

6. What is the impact of not providing continuous professional development programs for junior school teachers in your school?

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7. What is the impact of high workload under CBE in your school?

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8. What is the impact of resistance to change among junior school teachers regarding the CBE curriculum in your school?

---

9. What is the impact of ineffective recruitment strategies put in place for junior school teachers in your school?

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10. What is the impact of junior school teachers not being fully inducted for CBE in your school?

Section C: Impact of Selected Physical Resource Management Challenges on the Implementation of CBE in Public Junior Schools in Baringo County, Kenya

1. What is the impact of inadequate classrooms for CBE in your school?

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2. What is the impact of inadequate libraries on supporting CBE in your school?

3.what is the impact of insufficient textbooks for CBE in your school?

---

4. What is the impact of inadequate teaching aids for CBE in your school?

---

5. What is the impact of inadequate desks for CBE in your school?

---

6. What is the impact of insufficient playground space on CBE practical learning activities in your school?

---

7. What is the impact of inadequate chairs for CBE in your school?

---

8. What is the impact of inadequate laboratories on supporting CBE activities in your school?

---

9. What is the impact of the lack of electricity connectivity for CBE in your school?

---

10. What is the impact of the lack of a power backup generator for CBE in your school?

Section D: Impact of Selected ICT Resource Management Challenges on the Implementation of CBE in Public Junior Schools in Baringo County, Kenya

1**.** What is the impact of inadequate internet connectivity for CBE in your school?

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2. What is the impact of inadequate laptops for CBE in your school?

---

3. What is the impact of the lack of projectors for CBE lessons in your school?

---

4. What is the impact of the lack of a reliable system in place for repairing and maintaining ICT resources in your school?

---

5. What is the impact of the lack of technical support for maintaining ICT devices for CBE in your school?

---

6. What is the impact of inadequate Cameras for CBE in your school?

---

7. What is the impact of inadequate training of CBE teachers in integrating ICT in teaching in your school?

---

8. What is the impact of inadequate smartphones on CBE in your school?

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9. What is the impact of inadequate desktops for CBE in your school?

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10. What is the impact of the lack of tablets for CBE in your school?

Section E: Impact of Selected Financial Resource Management Challenges on the Implementation of CBE in Public Junior Schools in Baringo County, Kenya

1. What is the impact of not managing well the cost control for CBE in your school?

---

2. What is the impact of CBE funds not being timely disbursed to your school?

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3. What is the impact of not adequately allocating capital for CBE in your school?

4.What is the impact of insufficient allocation of funds to CBE in your school?----------

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5.What is the impact of not controlling expenses for CBE in your school?----------

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6. What is the impact of not managing resources well in addressing emerging issues in CBE in your school?

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7. What is the impact of not following the procurement rules for CBE in your school?

---

8. What is the impact of not well-managing assets for CBE in your school?

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9. What is the impact of not conducting auditing processes regularly for CBE in your school?

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10. What is the impact of not managing the school inventory well for CBE in your school

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Appendix III: Interview Schedule for Sub-County Directors

First, let me thank you for sparing time for the interview. The purpose of this study is to investigate the impact of management challenges on the implementation of Competency-Based Curriculum (CBE) in public junior schools within Baringo County. Your perspective as a subcounty director of education will provide a much clearer picture of the impact of these challenges from a management perspective and, therefore, will remain confidential.

Section A: Background Information

1. How long have you served as a sub-county director of education?

   _____

   _____

   _____

2. What is your highest academic qualification?

   _____

   _____

   _____

Section B: Impact of Selected Human Resource Management Challenges on the Implementation of CBE in Public Junior Schools in Baringo County, Kenya

1. What is the impact of inadequately qualified teachers trained in the CBE curriculum in public junior schools in your sub-county?

---

2. What is the impact of inadequate support staff in CBE implementation in public junior schools in your sub-county?

---

3. What is the impact of little communication between teachers and policy makers for CBE in public junior schools in your sub-county?

---

4. What is the impact of teachers not adequately trained in CBE pedagogies in public junior schools in your sub-county?

---

5. What is the impact of not providing regular feedback to teachers on the CBE curriculum in public junior schools in your sub-county?

---

6. What is the impact of not providing continuous professional development programs for junior school teachers in your sub-county?

---

7. What is the impact of high workload under CBE in the public junior school in your sub-county?

---

8. What is the impact of resistance to change among junior school teachers regarding the CBE curriculum in public junior schools in your sub-county?

---

9. What is the impact of ineffective recruitment strategies put in place for CBE in public junior school teachers in your sub-county?

---

10. What is the impact of junior school teachers not being properly inducted on CBE in public junior schools in your sub-county?

Section C: Impact of Selected Physical Resource Management Challenges on the Implementation of CBE in Public Junior Schools in Baringo County, Kenya

1. What is the impact of inadequate classrooms for CBE in public junior schools in your sub-county?

---

2. What is the impact of inadequate libraries for CBE in public junior schools in your sub-county?

---

3. what is the impact of insufficient textbooks for CBE in public junior schools in your sub-county?

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4. What is the impact of inadequate teaching aids for CBE in public junior schools in your sub-county?

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5. What is the impact of inadequate desks for CBE in public junior schools in your sub-county?

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6. What is the impact of insufficient playgrounds for CBE practical learning activities in public junior schools in your sub-county?

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7. What is the impact of inadequate chairs for CBE in public junior schools in your sub-county?

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8. What is the impact of the lack of electricity connectivity for CBE in the public junior school in your sub-county?

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9. What is the impact of inadequate tables for CBE in public junior schools in your sub-county?

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10. What is the impact of the lack of a power backup generator for CBE in your school?

Section D: Impact of Selected ICT Resource Management Challenges on The Implementation of CBE in Public Junior Schools in Baringo County, Kenya

1. What is the impact of inadequate internet connectivity on CBE in public junior schools in your sub-county?

---

2. What is the impact of inadequate laptops for CBE in public junior schools in your sub-county?

---

3. What is the impact of the lack of projectors for CBE lessons in public junior schools in your sub-county?

---

4. What is the impact of the lack of a reliable system in place for repairing and maintaining ICT resources in public junior schools in your sub-county?

---

5. What is the impact of the lack of technical support for maintaining ICT devices for CBE in public junior schools in your sub-county?

---

6. What is the impact of inadequate desktops for CBE in public junior schools in your sub-county?

---

7. What is the impact of inadequate training of CBE teachers on the integrating of ICT in teaching in your sub-county?

---

8. What is the impact of inadequate tablets for CBE students in public junior schools in your sub-county?

---

9. What is the impact of inadequate smartphones on CBE students in public junior schools in your sub-county?

---

10. What is the impact of inadequate iPads for CBE students in the public junior school in your sub-county?

Section E: Impact of Selected Financial Resource Management Challenges on The Implementation of CBE in Public Junior Schools in Baringo County, Kenya

1. What is the impact of not managing costs well for CBE in public junior schools in your sub-county?

---

2. What is the impact of CBE funds not being timely disbursed to junior schools in your sub-county?

---

3. What is the impact of inadequately allocating capital for CBE to junior schools in your sub-county?

---

4. What is the impact of insufficient allocation of funds to CBE for public junior schools in your sub-county?

---

5. What is the impact of not controlling expenses for CBE in public junior schools in your sub-county?

---

6. What is the impact of not managing resources well in addressing emerging issues in CBE in public junior schools in your sub-county?

---

7. What is the impact of not following the procurement rules for CBE in public junior schools in your sub-county?

---

8. What is the impact of not well managing assets for CBE in public junior schools in your sub-county?

---

9. What is the impact of not conducting auditing processes regularly for CBE in public junior schools in your sub-county?

---

10. What is the impact of not managing the school inventory well for CBE in public junior schools in your sub-county?

Thank you for your time and input. Your insights are invaluable and will contribute to a deeper understanding of the impact of selected resource management challenges on the implementation of CBE in Baringo County.

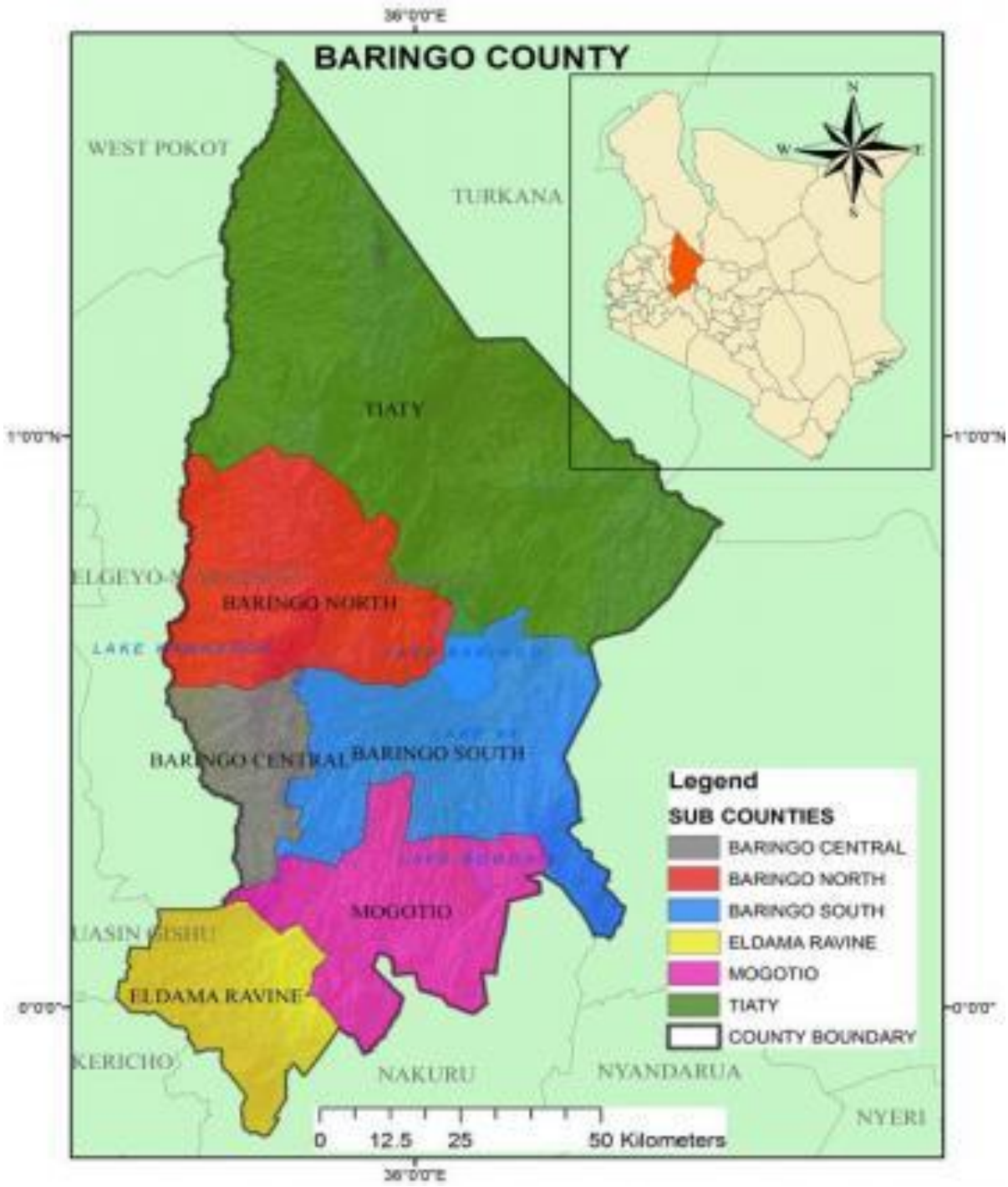
Appendix IV: Sample Size Determination Table

N	*S*	*N*	*S*	*N*	*S*
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note.—*N* is population size. *S* is sample size.

Source: Krejcie & Morgan, 1970

Appendix V: Map of Baringo County



Source: (County Government of Baringo, 2025)

Appendix VI: Informed Consent Form

Study Title: Management Challenges in the Implementation of the Competency-Based Education(CBE) in Public Junior Schools in Baringo County, Kenya

Introduction

We invite you to be a part of a research study that will examine management challenges associated with the implementation of the Competency-Based Curriculum in public junior schools in Baringo County, Kenya. This study sought to address issues on human, physical, ICT, and financial resources and evaluate the manner in which these challenges affect the delivery of the CBE.

Procedures

You will be asked to complete a structured questionnaire, and, if some of you agree, a semi-structured interview. It will take about 15–20 minutes to complete the questionnaire, and the interview will last about 30–45 minutes. All responses will be recorded, and with the understanding that your responses will be used solely for research purposes.

Voluntary Participation

Participation in this study is totally voluntary. At any time during the survey, you have the right to refuse to participate or to withdraw from the study without it having any adverse effects on you.

Anonymity and Confidentiality

Whatever information you provide will be kept absolutely confidential. Your data will be coded, and no identifying information will be linked to it. The research team will securely store the data on locked computers with passwords and will be accessible only to the research team.

Potential Risks

This study is considered low risk. Yet, management challenges may induce a slight discomfort as you recall institutional issues. We will make every possible effort so that you are not in any way harmed or made uncomfortable during participation.

Potential Benefits

You may not reap direct benefits from your participation. Still, your contribution will help in understanding the challenges of implementing CBE in rural Kenya, which will feed into policy and practice improvements.

Data Storage and Use

After the study ends and the data have been collected, the data will be stored securely for 5 years and then destroyed. The results will be reported in aggregated form so that responses of individual participants cannot be identified.

Results Communication

Upon completion of the study, participating schools and relevant educational authorities will receive a summary of the research findings.

Ethical Approval

The study has been reviewed and approved by the National Commission for Science, Technology and Innovation (NACOSTI) and other relevant authorities.

Contact Information

If you have any questions about this study or your rights as a participant, don't hesitate to get in touch with the researcher:

Maldrine Tallam
Kabarak University
Email Address: maldrinetallam@gmail.com
Phone Number: 0101692618

I understand that by signing below, I have read and understood the information provided above, and that this is a voluntary study, and I am agreeing to participate in this study.

_____

_____

Participant's Signature & Date _____ _____

Researcher's Signature & Date _____ _____

Appendix VII: KUREC Clearance Letter

KABARAK UNIVERSITY RESEARCH ETHICS COMMITTEE

Private Bag - 20157
KABARAK, KENYA
Email: kurec@kabarak.ac.ke

Tel: 254-51-343234/5
Fax: 254-051-343529
www.kabarak.ac.ke

OUR REF: KABU01/KUREC/001/01/07/25

Date: 30th April, 2025

Maldrine Tallam
Reg. No: GDE/M/1684/11/20
Kabarak University,

Dear Maldrine,

RE: IMPACT OF SELECTED RESOURCE MANAGEMENT CHALLENGES ON IMPLEMENTATION OF COMPETENCY BASED CURRICULUM IN PUBLIC JUNIOR SCHOOLS IN BARINGO COUNTY,KENYA

This is to inform you that ***KUREC*** has reviewed and approved your above research proposal. Your application approval number is ***KUREC-070425.*** The approval period is 30***/04/2025 – 30/04/ 2026.***

This approval is subject to compliance with the following requirements:

i. All researchers shall obtain an introduction letter to NACOSTI from the relevant head of institutions (Institute of postgraduate, School dean or Directorate of research)
ii. The researcher shall further obtain a RESEARCH PERMIT from NACOSTI before commencement of data collection & submit a copy of the permit to **KUREC.**
iii. Only approved documents including (informed consents, study instruments, MTA Material Transfer Agreement) will be used
iv. All changes including (amendments, deviations, and violations) are submitted for review and approval by ***KUREC***:
v. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to ***KUREC*** within 72 hours of notification;
vi. Any changes, anticipated or otherwise that may increase the risk(s) or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to ***KUREC*** within 72 hours;
vii. Clearance for export of biological specimens must be obtained from relevant institutions and submit a copy of the permit to KUREC;
viii. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal and;
ix. Submission of an executive summary report within 90 days upon completion of the study to ***KUREC***

Sincerely,

Prof. Jackson Kiteu PhD.
KUREC-Chairman

KABARAK UNIVERSITY
INSTITUTIONAL RESEARCH ETHICS COMMITTEE
30 APR 2025
APPROVED
P. O. PRIVATE BAG - 20157, KABARAK

Cc Vice Chancellor
DVC-Academic & Research
Registrar-Academic & Research
Director-Research Innovation & Outreach
Institute of Post Graduate Studies

Appendix VIII: NACOSTI Research Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **545064**

Date of Issue: **08/June/2025**

RESEARCH LICENSE

This is to Certify that Sr.. Maldrine Jemutai Tallam of Kabarak University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Baringo on the topic: IMPACT OF SELECTED RESOURCE MANAGEMENT CHALLENGES ON IMPLEMENTATION OF COMPETENCY BASED CURRICULLUM IN PUBLIC JUNIOR SCHOOLS IN BARINGO COUNTY, KENYA for the period ending : 08/June/2026.

License No: **NACOSTI/P/25/4174447**

545064

Applicant Identification Number

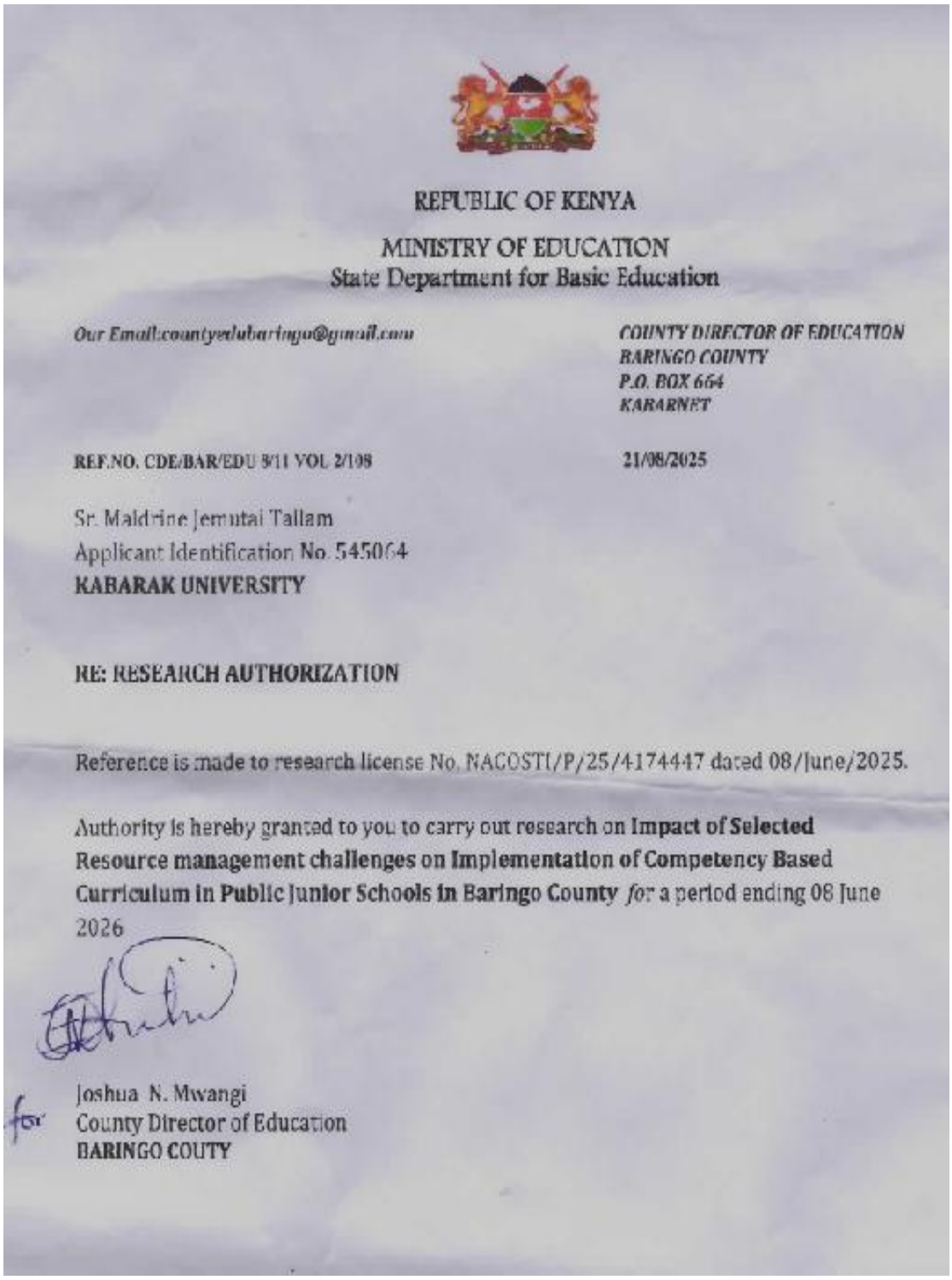
Deputy Director
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

See overleaf for conditions

Appendix IX: Ministry of Education Research Authorisation



REPUBLIC OF KENYA

MINISTRY OF EDUCATION
State Department for Basic Education

Our Email:countyeolubaringo@gmail.com

COUNTY DIRECTOR OF EDUCATION
BARINGO COUNTY
P.O. BOX 664
KABARNET

REF.NO. CDE/BAR/EDU 9/11 VOL 2/108

21/08/2025

Sr. Maldrine Jemutai Tallam
Applicant Identification No. 545064
KABARAK UNIVERSITY

RE: RESEARCH AUTHORIZATION

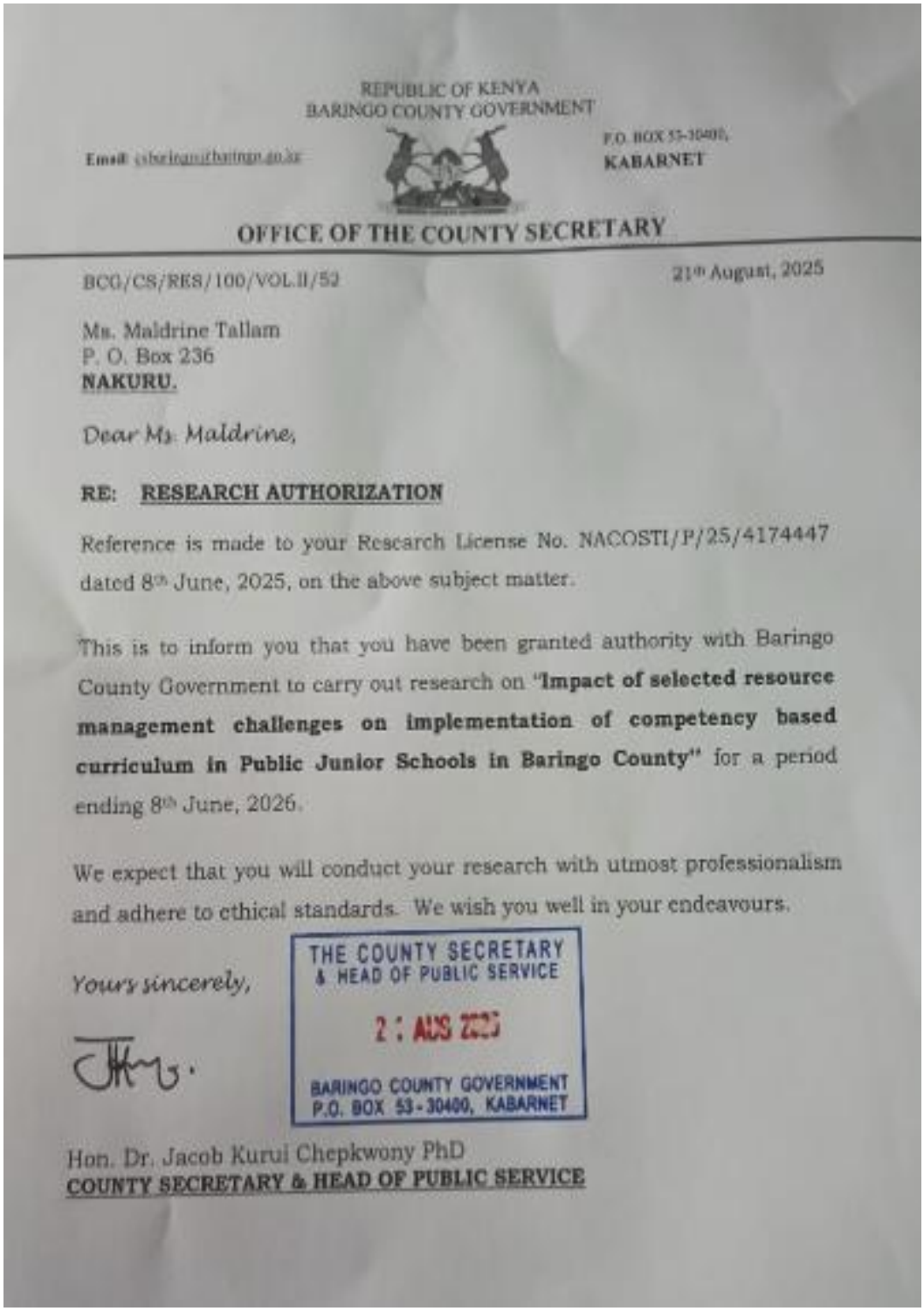
Reference is made to research license No. NACOSTI/P/25/4174447 dated 08/June/2025.

Authority is hereby granted to you to carry out research on **Impact of Selected Resource management challenges on Implementation of Competency Based Curriculum in Public Junior Schools in Baringo County** *for* a period ending 08 June 2026

for

Joshua N. Mwangi
County Director of Education
BARINGO COUTY

Appendix X: Baringo County Government Research Authorisation



REPUBLIC OF KENYA
BARINGO COUNTY GOVERNMENT

Email: cs@baringo.go.ke

P.O. BOX 53-30400,
KABARNET

OFFICE OF THE COUNTY SECRETARY

BCG/CS/RES/100/VOL.II/52

21st August, 2025

Ms. Maldrine Tallam
P. O. Box 236
NAKURU.

Dear Ms. Maldrine,

RE: RESEARCH AUTHORIZATION

Reference is made to your Research License No. NACOSTI/P/25/4174447 dated 8th June, 2025, on the above subject matter.

This is to inform you that you have been granted authority with Baringo County Government to carry out research on **"Impact of selected resource management challenges on implementation of competency based curriculum in Public Junior Schools in Baringo County"** for a period ending 8th June, 2026.

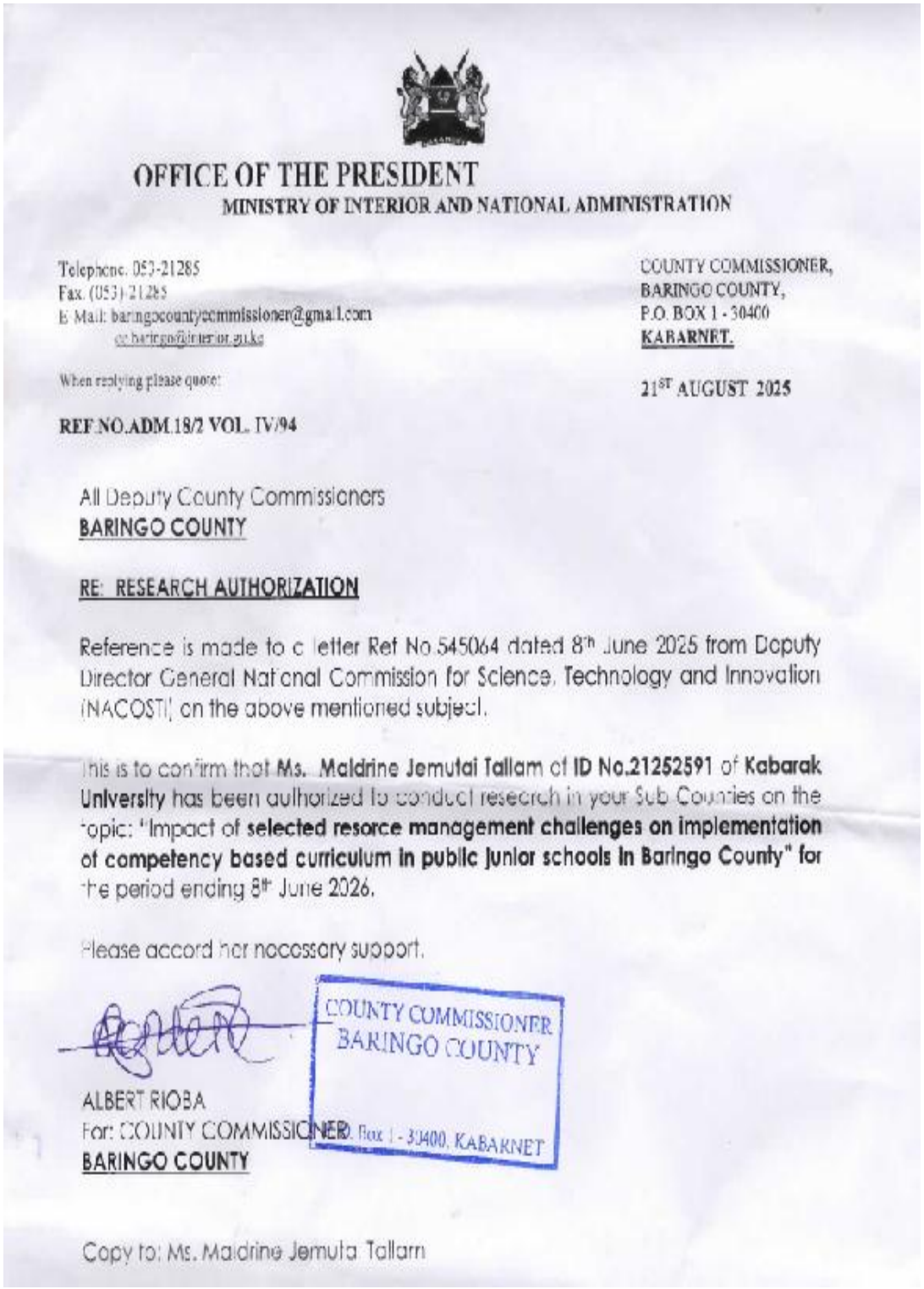
We expect that you will conduct your research with utmost professionalism and adhere to ethical standards. We wish you well in your endeavours.

Yours sincerely,

THE COUNTY SECRETARY
& HEAD OF PUBLIC SERVICE
21 AUG 2025
BARINGO COUNTY GOVERNMENT
P.O. BOX 53-30400, KABARNET

Hon. Dr. Jacob Kurui Chepkwony PhD
COUNTY SECRETARY & HEAD OF PUBLIC SERVICE

Appendix XI: Baringo County Commissioner Research Authorisation



OFFICE OF THE PRESIDENT
MINISTRY OF INTERIOR AND NATIONAL ADMINISTRATION

Telephone: 053-21285
Fax: (053) 21285
E Mail: baringocountycommissioner@gmail.com
cc baringo@interior.go.ke

When replying please quote:

COUNTY COMMISSIONER,
BARINGO COUNTY,
P.O. BOX 1 - 30400
KABARNET.

21ST AUGUST 2025

REF NO.ADM.18/2 VOL. IV/94

All Deputy County Commissioners
BARINGO COUNTY

RE: RESEARCH AUTHORIZATION

Reference is made to c letter Ref No 545064 dated 8th June 2025 from Deputy Director General National Commission for Science, Technology and Innovation (NACOSTI) on the above mentioned subject.

This is to confirm that **Ms. Maidrine Jemutai Tallam** of **ID No.21252591** of **Kabarak University** has been authorized to conduct research in your Sub Counties on the topic: "Impact of **selected resorce management challenges on implementation of competency based curriculum in public junior schools in Baringo County**" for the period ending 8th June 2026.

Please accord her necessary support.

COUNTY COMMISSIONER
BARINGO COUNTY
P.O. Box 1 - 30400, KABARNET

ALBERT RIOBA
For: COUNTY COMMISSIONER
BARINGO COUNTY

Copy to: Ms. Maidrine Jemuta Tallam

Appendix XII: Evidence of Conference Participation

KABARAK UNIVERSITY

Certificate of Participation

Awarded to

Maldrine Jemutai Tallam

For successfully participating in the 15th Annual Kabarak University International Research Conference held from 15th -16th October, 2025and presented a paper entitled ***"The impact of selected physical resource management challenges on the implementation of CBC in public junior schools in Baringo county, Kenya"***

Conference Theme

Current Trends in Education Management, Policy, Curriculum Design and Pedagogy

Prof. Gladys Kiptiony
Dean, School of Education, Humanities & Social Sciences

Dr. Phillip Nyawere
Director - Research, Innovation and Outreach

Kabarak University Moral Code

As members of Kabarak University family, we purpose at all times and in all places, to set apart in one's heart, Jesus as Lord.

(1 Peter 3:15)

Kabarak University is ISO 9001:2015 Certified

Appendix XIV: List of Publications

JRIIE Journal of Research Innovation and Implications in Education
Center for Research Implications & Practice

Website:www.jriiejournal.com ISSN 2520-7504 (Online) Vol.9, Iss.4, 2025 (pp. 470 – 483)

Impact of Selected Human Resource Management Challenges on the Implementation of Competency-Based Education in Public Junior Schools in Baringo County, Kenya

Maldrine Jemutai Tallam, Henry K. Kiplangat & Fredrick B. J. A. Ngala
Department of Education, School of Education, Humanities and Social Sciences
Kabaraka University, Kenya
Email: maldrinetallam@gmail.com

Abstract: *This study examined the impact of selected human resource management (HRM) challenges on the implementation of Competency-Based Education (CBE) in public junior schools in Baringo County, Kenya. CBE was introduced in Kenya in 2017 to equip learners with skills and competencies relevant to the 21st century. However, its success depended largely on effective management of human resources, particularly teacher recruitment, training, motivation, and supervision. The study adopted a descriptive research design to analyze how HRM challenges affected CBE implementation. A sample of 317 respondents, including head teachers, teachers, and sub-county directors, was drawn using stratified random sampling. Data were collected using teachers' questionnaires and interviews guides for headteachers and Sub-county Director of Education and analyzed through descriptive and inferential statistics. The findings revealed that inadequate teacher training, weak recruitment strategies, lack of induction and continuous professional development, limited communication between teachers and policymakers, and high workloads significantly hindered effective CBE implementation. Teachers also exhibited resistance to change, partly due to insufficient preparation for the new pedagogy. Although regression analysis indicated that HRM challenges explained only a small portion of the variance in CBE implementation, qualitative data confirmed their pervasive influence on instructional quality and teacher motivation. The study concluded that addressing HRM constraints through structured training, effective recruitment, mentorship, workload rationalization, and strengthened feedback mechanisms is vital for sustaining CBE reforms. It recommended institutionalizing continuous professional development and improving teacher support systems to enhance curriculum delivery and learner outcomes.*

Keywords: *Human Resource Management, Competency-Based Education, Teacher Training, Professional Development, Curriculum Implementation*

How to cite this work (APA):

Tallam, M. J., Kiplangat, H. K. & Ngala, F. B. J. A. (2025). Assessing the Impact of Financial Resource Management Challenges 29 on Competency Based Education Implementation in Public Junior Schools in Baringo County. *Journal of Research Innovation 30 and Implications in Education, 9*(4), 470 – 483. **https://doi.org/10.59765/bytg94.**.

1. Introduction

Competency-Based Education (CBE) emerged as a transformative paradigm in global education, shifting the focus from traditional content-based instruction to an approach that emphasized the acquisition and demonstration of specific skills, knowledge, and attitudes. In Kenya, the introduction of the Competency-Based Curriculum (CBC) in 2017 marked a significant policy shift aimed at aligning education with the dynamic needs of the 21st-century learner and the demands of a rapidly

JRIIE Journal of Research Innovation and Implications in Education
Center for Research Implications & Practice

Website:www.jriiejournal.com ISSN 2520-7504 (Online) Vol.9, Iss.3, 2025 (pp. 484 – 496)

Assessing the Impact of Financial Resource Management Challenges on Competency Based Education Implementation in Public Junior Schools in Baringo County

Maldrine Jemutai Tallam, Henry K. Kiplangat & Fredrick B. J. A. Ngala
Department of Education, School of Education, Humanities and Social Sciences
Kabaraka University, Kenya
Email: maldrinetallam@gmail.com

Abstract: *The study assessed the impact of financial resource management constraints on the implementation of Competency-Based Education (CBE) in public junior schools in Baringo County, Kenya. The shift to CBE in Kenya demanded effective financial planning, budgeting, and resource allocation to sustain learner-centered approaches. However, schools in rural and resource-limited contexts such as Baringo County experienced challenges that hindered smooth implementation. The study adopted a descriptive research design guided by positivist philosophy, targeting 1,739 respondents, including head teachers, junior school teachers, and sub-county directors. A sample of 317 respondents was selected using stratified random sampling. Data were collected through structured questionnaires and semi-structured interviews, and analyzed using both descriptive and inferential statistics, complemented by thematic analysis for qualitative data. The findings revealed that inadequate financial planning, delayed fund disbursement, weak accountability systems, and poor budget prioritization significantly affected the provision of instructional materials, teacher training, and infrastructural development required for CBE. Regression analysis indicated a strong relationship between financial resource management practices and effective curriculum implementation. The study concluded that strengthening financial management capacity and timely funding are essential for successful CBE implementation. It recommended enhanced budgetary oversight, capacity building for school managers, and strategic government support to ensure sustainable financing of CBE reforms.*

Keywords: *Financial resource management, Competency-based education, Implementation challenges, Baringo County, educational financing.*

Tallam, M. J., Kiplangat, H. K. & Ngala, F. B. J. A. (2025). Assessing the Impact of Financial Resource Management Challenges on Competency Based Education Implementation in Public Junior Schools in Baringo County. *Journal of Research Innovation and Implications in Education, 9*(4), 484 – 496. **https://doi.org/10.59765/mwz47g.**

1. Introduction

Competency-Based Education (CBE) has emerged as a transformative approach to learning, emphasizing the acquisition of practical skills, knowledge, and attitudes necessary for learners to thrive in the 21st-century world. Unlike the traditional content-based system, CBE focuses on measurable learning outcomes where learners progress upon demonstrating mastery of specific competencies. Many countries, including Kenya, have adopted CBE reforms in response to the global demand for education systems that produce creative, critical, and problem-solving individuals. However, successful implementation of CBE relies heavily on adequate financial resources to support teacher training, instructional materials, infrastructure, and assessment reforms. Financial resource management is therefore a critical component in the