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Influence of Teachers' Competence on Learners Acquisition of Critical Thinking and Problem-Solving Skills in Kenyan Schools

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Abstract: *Critical thinking and problem-solving skills are increasingly recognized as essential competencies for learners in the 21st century, particularly in education systems seeking to respond to complex social, economic, and technological challenges. In Kenya, curriculum reforms emphasize these higher-order skills as core learning outcomes, placing new demands on classroom teaching and assessment practices. However, the extent to which learners acquire critical thinking and problem-solving skills is closely linked to teacher competence, including pedagogical knowledge, questioning strategies, assessment literacy, and professional practice. This article presents a desk review of global, regional, and Kenyan literature examining the influence of teacher competence on learners' acquisition of critical thinking and problem-solving skills in Kenya. Guided by constructivist learning theory, pedagogical content knowledge theory, and systems theory, the review synthesizes empirical evidence across contexts to identify key patterns, gaps, and implications. The findings indicate that competent teaching practices, particularly inquiry-based pedagogy, higher-order questioning, and formative assessment significantly enhance learners' opportunities to develop critical thinking and problem-solving skills. However, the review also reveals uneven implementation driven by limitations in sustained professional development, assessment alignment, and systemic support, especially in under-resourced school contexts. The article concludes that strengthening teacher competence through coherent, practice-based professional learning and aligned assessment systems is central to realizing curriculum intentions and promoting equitable development of critical thinking and problem-solving skills among Kenyan learners.*

Key Terms: *Teacher Competence; Critical Thinking; Problem-solving Skills; Learner Outcomes; Pedagogy*

1.1 Introduction

Across the world, education is increasingly judged not only by how much content learners can recall, but by whether learners can think clearly, reason through uncertainty, and solve problems that matter in real life. Critical thinking and problem-solving have become central to this shift because they underpin lifelong learning, innovation, and responsible citizenship in societies shaped by rapid technological and social change (OECD, 2019). In Kenya, these expectations are explicitly reflected in national curriculum reforms. The Kenya Institute of Curriculum Development (KICD) identifies critical thinking and problem solving as one of the core competencies that basic education should develop, signaling a

decisive move away from purely examination-driven learning toward competence and application (KICD, 2017).

Yet, what learners become good at is deeply connected to what classrooms consistently ask them to do. When teaching is dominated by note-taking, short-answer recall, and "covering the syllabus," learners may become skilled at reproduction rather than reasoning. Conversely, when teaching encourages questioning, dialogue, analysis, and authentic tasks, learners gain repeated opportunities to practice thinking and problem-solving as habits, not slogans. In this sense, the CBC's ambition depends heavily on the competence of teachers, not only their qualifications, but also their pedagogical skill, assessment literacy, and ability to create learning environments where thinking is expected, supported, and assessed fairly.

This article therefore examines how teacher competence influences learners' acquisition of critical thinking and problem-solving skills in Kenya, drawing on global and regional evidence while remaining grounded in Kenyan curriculum expectations and implementation realities.

1.2 Background of the Study

The global turn toward competency-oriented learning is partly a response to a recognized limitation in traditional curricula: learners may succeed in high-stakes examinations yet struggle to apply knowledge in unfamiliar situations. International frameworks increasingly describe learning as the development of transferable competencies such as reasoning, collaboration, and creativity supported through coherent curriculum, pedagogy, and assessment systems (OECD, 2019). However, global evidence also shows that such competencies are rarely developed through policy statements alone; they are developed through classroom routines that consistently require learners to justify claims, evaluate evidence, test ideas, and reflect on their thinking.

In Kenya, the Basic Education Curriculum Framework provides a clear policy foundation for this shift by positioning critical thinking and problem solving among the core competencies expected of learners across basic education (KICD, 2017). The framework signals that learners should not merely learn content, but use knowledge meaningfully, an emphasis that places new demands on classroom teaching and assessment. Yet scholarship on learner-centred reforms in low- and middle-income contexts cautions that implementation often becomes uneven when teachers face large classes, limited resources, and assessment systems that reward recall more than reasoning (Schweisfurth, 2015; UNESCO, 2017).

Teacher competence is therefore central to whether critical thinking and problem-solving become real learning outcomes or remain aspirational. Competent teachers are more likely to design inquiry tasks, facilitate discussion, ask higher-order questions, and assess reasoning not only correct answers. Where teacher competence is constrained by limited pedagogical support or weak assessment literacy, classroom practice may default to "safe" routines of lecture and drilling, even when curriculum frameworks advocate otherwise. In Kenya's CBC context, this tension is especially important because the curriculum explicitly expects learners to demonstrate competencies, meaning that teaching must be structured to produce evidence of thinking, not only evidence of coverage (KICD, 2017).

1.3 Statement of the Problem

Although Kenya's curriculum frameworks explicitly require schools to develop critical thinking and problem-solving as core competencies, there is persistent concern that classroom practice does not consistently provide learners with the conditions needed to acquire these skills. A critical issue is that critical thinking is not developed through intention alone; it develops through repeated exposure to learning tasks that demand reasoning, explanation, reflection, and structured problem-solving.

However, existing literature in Kenya and comparable contexts frequently reports that teachers face constraints that limit the consistent implementation of learner-centred pedagogy and competency-oriented assessment, including workload pressures, resource gaps, and entrenched examination cultures (Schweisfurth, 2015; UNESCO, 2017). In addition, scholarship that reviews Kenya's competency-based reforms has raised concerns about practical hurdles that could limit the curriculum's ability to deliver on its competency promises if implementation support is insufficient (Heto, 2020).

The problem addressed in this desk review is therefore that, despite policy emphasis on critical thinking and problem-solving, there remains insufficient integrated evidence—within the Kenyan context—on how teacher competence (pedagogy, assessment literacy, and instructional decision-making) shapes learners' acquisition of these skills, and what gaps remain for strengthening teaching practice and evaluation.

1.4 Purpose of the Article

The purpose of this article is to examine the influence of teacher competence on learners' acquisition of critical thinking and problem-solving skills in Kenya through a desk review of relevant global, regional, and national literature.

1.5 Objectives of the Article

This article seeks to:

i. Review theoretical perspectives explaining how teacher competence shapes learner development of critical thinking and problem-solving skills.
ii. Synthesize empirical evidence (global, regional, and Kenyan) on the relationship between teacher competence and learners' critical thinking and problem-solving outcomes.
iii. Identify literature gaps relevant to Kenya's competency-based education goals.
iv. Draw implications for teacher development, instructional leadership, assessment practice, and future research.

1.6 Scope and Delimitation of the Study

This article is limited by its desk review methodology, which relies exclusively on secondary sources, peer-reviewed studies, policy documents, and reports. As such, the conclusions depend on the quality and scope of available literature and do not include direct classroom observations or primary data from teachers and learners. The review is also limited by variability in how different studies define and measure "teacher competence" and "critical thinking," which can affect comparability across contexts.

In terms of scope, the article focuses on Kenya's basic education context, with selective use of global and African literature for conceptual and comparative grounding. The analysis is anchored in Kenya's curriculum expectations for critical thinking and problem-solving as core competencies (KICD, 2017). The review does not provide a subject-by-subject audit, nor does it evaluate higher education or TVET in depth, except where such literature offers directly relevant insight into classroom pedagogy and competency development.

1.7 Significance of the Study

This study is significant at both policy and practice levels, particularly in the context of Kenya's ongoing efforts to strengthen competency-based education and improve learner outcomes. By synthesizing existing literature on the influence of teacher competence on learners' acquisition of critical thinking and problem-solving skills, the study contributes to a clearer understanding of how curriculum intentions translate into classroom realities. For curriculum developers and policymakers, especially within the Kenya Institute of Curriculum Development and the Ministry of Education, the study provides evidence-based insights that can inform refinement of teacher support strategies, curriculum implementation guidelines, and monitoring frameworks aligned to competency development.

The study is also significant for teacher education institutions, school leaders, and practicing teachers. By highlighting specific dimensions of teacher competence such as pedagogical skill, assessment literacy, and instructional decision-making the findings underscore areas where professional development can have the greatest impact on learner thinking and problem-solving. For researchers, the study identifies critical gaps in outcome-focused and equity-sensitive research, thereby offering a foundation for future empirical inquiry. Overall, the study contributes to academic discourse on competency-based education by reinforcing the central role of teacher competence in enabling learners not only to acquire knowledge, but to think critically and solve problems effectively.

1.8 Review of Related Literature

This section reviews theoretical and empirical literature relevant to understanding how teacher competence influences learners' acquisition of critical thinking and problem-solving skills. The review is organized into three parts: theoretical perspectives underpinning the relationship between teaching and higher-order thinking, empirical studies arranged from global to national contexts, and the identification of the research gap addressed by this desk review.

1.8.1 Theoretical Review

The development of critical thinking and problem-solving skills is not accidental; it is rooted in specific theories of learning and teaching that emphasize how knowledge is constructed, applied, and assessed. Three theoretical perspectives are particularly relevant to this study: Constructivist Learning Theory, Pedagogical Content Knowledge Theory, and Systems Theory.

Constructivist Learning Theory

Constructivist learning theory, associated with the work of Piaget (1972) and Vygotsky (1978), views learning as an active process in which learners construct understanding through interaction, inquiry, and

reflection. Rather than receiving knowledge passively, learners are expected to engage with problems, test ideas, and negotiate meaning through social interaction.

The strength of constructivist theory lies in its strong alignment with the development of critical thinking and problem-solving skills. By emphasizing questioning, exploration, and reflection, constructivism provides a clear rationale for learner-centred pedagogy and inquiry-based learning. Learners develop reasoning skills when they are challenged to justify answers, consider alternatives, and apply knowledge to unfamiliar situations.

However, constructivist theory also has notable limitations. Its effective application requires teachers with high pedagogical competence, strong classroom management skills, and the ability to design meaningful learning tasks. In contexts where teachers face large classes, limited instructional time, or insufficient professional support, constructivist approaches may be implemented superficially or inconsistently.

This theory is highly relevant to the present study because critical thinking and problem-solving, as emphasized in Kenya's curriculum frameworks, are inherently constructivist outcomes. Teacher competence determines whether constructivist principles are realized in practice or reduced to policy rhetoric.

Pedagogical Content Knowledge (PCK) Theory

Pedagogical Content Knowledge theory, introduced by Shulman (1986), emphasizes that effective teaching requires more than subject knowledge. Teachers must be able to transform content into forms that are understandable, engaging, and cognitively challenging for learners. This includes knowing how to represent ideas, anticipate misconceptions, pose effective questions, and guide learners through complex reasoning processes.

A key strength of PCK theory is its direct connection to classroom practice. Teachers with strong pedagogical content knowledge are better positioned to design learning activities that stimulate analysis, comparison, and problem-solving rather than rote memorization. PCK also highlights assessment competence, as teachers must recognize evidence of learner thinking and provide feedback that advances reasoning.

The weakness of PCK theory lies in its development demands. Building strong pedagogical content knowledge requires sustained professional learning, mentoring, and reflective practice—conditions that may not be consistently available across all school contexts. In under-resourced settings, teachers may possess subject knowledge but lack opportunities to refine pedagogical strategies that foster higher-order thinking.

PCK theory is directly relevant to this study because it explains why teacher competence matters not only in *what* is taught, but in *how* learners are guided to think and solve problems. It provides a framework for linking teacher competence to learner cognitive outcomes.

Systems Theory

Systems theory, as applied to education by Bronfenbrenner (1979), conceptualizes teaching and learning as part of an interconnected system involving teachers, learners, curriculum, assessment, leadership, and policy environments. Changes in one part of the system affect outcomes elsewhere.

The strength of systems theory lies in its holistic perspective. It helps explain why improving teacher competence alone may not automatically lead to improved learner outcomes if assessment regimes, leadership support, or resource allocation remain misaligned. Systems theory therefore supports evaluation approaches that consider inputs, processes, outputs, and outcomes together.

Its limitation is that it offers limited guidance on specific instructional strategies, focusing instead on relationships and structures. Nevertheless, it is highly relevant to this study because teacher competence operates within broader institutional and policy contexts that shape opportunities for critical thinking and problem-solving in classrooms.

1.8.2 Empirical Review

Furtak, Seidel, Iverson, & Briggs (2012), "*Experimental and Quasi-Experimental Studies of Inquiry-Based Science Teaching"* employed a meta-analysis of experimental and quasi-experimental studies to examine how inquiry-based teaching affects student learning. The synthesis shows that inquiry-based instruction, especially when teachers provide appropriate guidance rather than leaving inquiry fully unguided supports deeper learning outcomes that align with higher-order reasoning (e.g., interpreting evidence, justifying conclusions). The gap is that while the review clarifies "what works" in inquiry design, it is less explicit on the *teacher competence components* (assessment literacy, questioning skill, task design) that make guided inquiry feasible in everyday classrooms.

Brandt et al. (2013), "*The Impact of eMINTS Professional Development on Teacher Instruction and Student Achievement*" used an evaluation design to assess a professional development model built around inquiry-oriented instruction and classroom technology integration. The report indicates that sustained professional development can shift teacher practice toward more student-centred, inquiry-driven instruction, which is typically associated with stronger student reasoning and problem-solving opportunities. The gap is that the report is not framed specifically around *critical thinking and problem-solving measures* as outcomes (it reports broadly on instruction and achievement), making it harder to isolate how teacher competence changes translate into measurable higher-order thinking gains.

Salinitri (2018), "*Analysis of Canadian Inquiry-Based Science Teaching*" applied a comparative study design (within Ontario's science curriculum environment) to examine inquiry-based teaching as a policy expectation and classroom practice. The study reports that students become more receptive at higher cognitive levels when teachers effectively incorporate inquiry-based teaching, underscoring that inquiry (and therefore critical thinking) depends on the teacher's ability to plan, facilitate, and manage inquiry routines. The gap is that it largely infers higher-order thinking from pedagogy rather than directly measuring learner critical thinking and problem-solving outcomes with validated instruments.

Higher Education Quality Council of Ontario (HEQCO) (2014), "*Evaluating Critical Thinking and Problem Solving in Large Classes: Model-Eliciting Activities…"* examined the use of model-eliciting activities (real-world, problem-based tasks) in a university engineering course. The report provides evidence that structured, authentic tasks can cultivate problem-solving and critical thinking even in large-class contexts when instructors deliberately design and facilitate these activities. The gap is that the setting is higher education and does not directly translate to Kenyan basic education classrooms, where teacher preparation, curriculum pacing, and assessment pressures differ substantially.

Arifin et al. (2025), "*The Effect of Inquiry-Based Learning on Students' Critical Thinking Skills in Science Education*" used a meta-analysis framework to estimate the impact of inquiry-based learning on critical thinking and to examine moderating factors. The review reinforces that inquiry-based models can improve critical thinking, but also highlights that outcomes vary depending on how inquiry is structured, suggesting that teacher competence in scaffolding inquiry is not optional, it is the mechanism through which inquiry produces higher-order thinking. The gap is that the meta-analysis synthesizes intervention effects but gives limited attention to how teacher competence is developed and sustained in real school systems.

Ho (2022), "*Delegating Critical Thinking Skills in Learners through Questioning Techniques*" employed a classroom-focused research design examining how teachers use questioning (often mapped to Bloom's taxonomy levels) to promote critical thinking. The findings support a practical message: when teachers deliberately ask higher-order questions and allow learners to explain reasoning, classroom talk becomes a vehicle for critical thinking development. The gap is that the study tends to focus on frequency/type of questions, with less depth on the broader competence ecosystem (feedback, task design, assessment alignment) needed to sustain problem-solving as a routine.

Song (2019), "*A Study on the Influence of Teachers' Questioning…*" used a classroom-based correlational design to relate teacher questioning to student critical thinking scores. It reports a positive relationship between teacher questioning practices and student critical thinking performance, reinforcing that teacher competence is not only about content delivery but about managing dialogue that stretches learners' reasoning. The gap is that correlational design limits causal claims and does not fully control for contextual factors (class size, prior achievement, school resourcing).

Across Africa, empirical and synthesis literature indicates that teacher competence development is often constrained by training models that are episodic, under-resourced, or insufficiently tied to classroom practice. Mitchell et al. (2024), *"Teacher Professional Development in Africa: A Critical Synthesis of Research Evidence*" provides a critical synthesis of research on teacher professional development across Sub-Saharan Africa and stresses the importance of sustained, practice-embedded teacher learning rather than one-off workshops. The gap is that while the synthesis clarifies what effective professional development should look like, evidence directly linking specific teacher competence improvements to measured learner critical thinking and problem-solving outcomes remains limited in many African contexts.

At the policy-implementation interface, UNESCO (2024), "*Competency-based curricula in Eastern and Southern Africa***"** presents a regional policy-informed review highlighting that competency-based

reforms explicitly prioritise skills such as critical thinking and problem-solving, but implementation depends heavily on teacher capacity, assessment coherence, and classroom realities. The gap is that broad regional reviews often cannot supply fine-grained evidence on which teacher competence dimensions (questioning, feedback, task design, assessment literacy) most predict learner cognitive outcomes at scale.

In East Africa, the literature is especially clear that classroom pedagogy and assessment culture can either open or close space for higher-order thinking. Hardman et al. (2017), "*School-Based Teacher Professional Development in East Africa: Emerging Lessons from Kenya and Tanzania*" draws on school-based professional development evidence to show that narrow "recitation-style" pedagogy (chorus responses, teacher monologue) does not support critical thinking or problem-solving, and argues for professional learning models that change everyday classroom routines. The gap is that the study is stronger on pedagogy change and professional development logic than on direct measurement of critical thinking and problem-solving outcomes using validated tools.

Giacomazzi et al. (2022), "*Problem solving in East Africa: A contextual definition*" used a contextual, cross-country inquiry to clarify how "problem solving" is understood in Kenya, Tanzania, and Uganda. The study's value is that it cautions against importing definitions of problem-solving without cultural and contextual grounding, which has implications for how teacher competence is framed and assessed. The gap is that it focuses on meaning-making and contextual definitions rather than classroom interventions that test how teacher competence improvements translate into learner gains.

Kenyan literature supports the argument that teacher competence is a practical gatekeeper for whether critical thinking and problem-solving become real classroom outcomes. Momanyi and Rop (2019), "Teacher Preparedness for the Implementation of Competency-Based Curriculum in Kenya" used a survey design and found that limited teacher preparedness (training and resource readiness) threatens the development of core competencies explicitly including critical thinking and problem-solving under CBC. The gap is that the study relies heavily on teacher-reported preparedness and does not directly measure learner critical thinking or problem-solving outcomes.

Ongesa (2020), "Critical Thinking Skill Gap in the Kenyan Educational Curriculum" applied a critical analysis approach and identified weaknesses in how critical thinking is conceptualized, taught, and measured, including the lack of shared understanding and the difficulty of developing metrics for learning outcomes. This work is valuable because it connects teacher competence and assessment clarity to the feasibility of teaching critical thinking meaningfully. The gap is that it is largely conceptual/analytical rather than classroom-outcome empirical research.

At a more system-level evidence base, Brookings (2025), "Learning What Matters in Kenya" synthesizes national priorities and definitions of core competencies (including critical thinking and problem solving) and highlights the centrality of teaching quality and teacher qualifications in shaping competency development. The gap is that while it strengthens the national framing and definitions, it does not replace classroom-level empirical studies that isolate how specific teacher competence dimensions (e.g., questioning, feedback, task design) causally impact learner critical thinking outcomes across varied school contexts.

Research Gap

The reviewed empirical literature from the USA, Canada, Asia, India, Africa, East Africa, and Kenya demonstrates broad consensus that teacher competence plays a decisive role in shaping learners' critical thinking and problem-solving skills. Across contexts, studies consistently show that inquiry-based pedagogy, higher-order questioning, formative assessment, and well-designed learning tasks are associated with improved learner reasoning. However, despite this convergence, several important gaps remain evident particularly when the evidence is examined through the lens of Kenya's basic education context and competency-based curriculum expectations.

There is a persistent outcome-level gap in the literature. While many studies document instructional practices or professional development initiatives, relatively few empirically measure learners' actual gains in critical thinking and problem-solving skills using validated or contextually appropriate tools. This limitation is especially pronounced in African and Kenyan studies, which often rely on teacher perceptions, policy analysis, or descriptive accounts of classroom challenges rather than direct evidence of learner cognitive outcomes. As a result, there is insufficient clarity on the magnitude and consistency of learner gains attributable to teacher competence.

The literature also reveals a disconnect between teacher competence constructs and learner outcomes. Many studies examine teacher competence in broad terms—such as training, preparedness, or attitudes—without disaggregating specific, actionable dimensions of competence (for example, questioning techniques, feedback quality, task design, or assessment literacy). This limits the ability of policymakers and teacher education institutions to identify which aspects of teacher competence most strongly influence critical thinking and problem-solving, and therefore where professional development investments should be prioritized.

In addition, there is a contextual and systemic gap in how evidence is generated and interpreted. Much of the strongest empirical evidence originates from high-income contexts (e.g., USA and Canada), where class sizes, resources, and assessment systems differ substantially from those in Kenya. Conversely, studies from Kenya and the wider East African region are often contextually rich but methodologically limited in linking teaching practices to learner outcomes. Few studies explicitly situate teacher competence within broader systemic factors—such as assessment regimes, instructional leadership, and curriculum coherence—as emphasized in national frameworks developed by the Kenya Institute of Curriculum Development.

There is also a longitudinal and equity-related gap. Existing studies rarely track how teacher competence influences the development of critical thinking and problem-solving skills over time or across diverse school contexts. This limits understanding of whether observed practices lead to sustained learner competence and whether disparities in teacher support and resourcing contribute to unequal learning opportunities.

In response to these gaps, this study synthesizes global, regional, and Kenyan literature through a theory-informed and system-oriented lens. By integrating evidence on teacher competence with learner cognitive outcomes and contextual realities, the study provides a structured foundation for policy

reflection and future empirical research focused on strengthening critical thinking and problem-solving skills in Kenyan classrooms.

1.9 Research Methodology

Research Design: This study adopted a desk review research design, also referred to as a systematic literature review approach, to examine the influence of teacher competence on learners' acquisition of critical thinking and problem-solving skills in Kenya schools. A desk review design is appropriate where the objective is to synthesize, interpret, and integrate existing knowledge rather than to generate primary data. This approach enables comprehensive analysis of theoretical perspectives, empirical findings, and policy documents across multiple contexts, providing a robust evidence base for analytical and interpretive conclusions.

The desk review design is particularly suitable for this study given the policy-driven nature of competency-based education and the availability of substantial global, regional, and national literature on teacher competence and higher-order learning outcomes. By drawing on diverse sources, the study situates the Kenyan experience within broader international debates while remaining grounded in local curriculum and educational realities.

Sources of Data: Data for the desk review were obtained exclusively from **secondary sources**, including:

Peer-reviewed journal articles on teacher competence, critical thinking, and problem-solving skills; International policy and research reports from organizations such as UNESCO and the OECD; Regional African education research and synthesis reports; National policy documents, curriculum frameworks, and evaluation reports relevant to Kenya's basic education system; and Academic books and theoretical texts underpinning learning, pedagogy, and curriculum reform

These sources were selected to ensure conceptual depth, empirical breadth, and contextual relevance to Kenya's education system.

Literature Search Strategy: The literature search was conducted through systematic searches of academic databases and digital repositories, including Google Scholar, ERIC, Scopus, and institutional websites of international and national education bodies. Key search terms included combinations of *teacher competence*, *critical thinking*, *problem-solving skills*, *learner-centred pedagogy*, *competency-based education*, and *Kenya*. To enhance relevance, the review prioritized literature published within the last fifteen years, while seminal theoretical works were included where necessary to anchor the conceptual framework. Both global and region-specific studies were deliberately incorporated to allow comparative and contextual analysis.

Inclusion and Exclusion Criteria: Inclusion criteria for the reviewed literature were as follows:- Studies explicitly addressing teacher competence, instructional practices, or professional development; Research examining critical thinking and/or problem-solving as learner outcomes; Literature relevant to basic education or teacher preparation; Studies conducted in global, regional (Africa/East Africa), or Kenyan contexts; Peer-reviewed articles, reputable institutional reports, and official policy documents

Exclusion criteria included: - Studies focusing exclusively on higher education or technical training without relevance to basic education; Opinion pieces lacking empirical or theoretical grounding; and Publications without clear methodological descriptions.

Data Analysis and Synthesis: Data analysis followed a thematic and analytical synthesis approach. Reviewed literature was first organized into thematic categories aligned with the study objectives, including theoretical perspectives, dimensions of teacher competence, instructional practices, assessment approaches, and learner outcomes. Empirical studies were further analyzed according to author(s), title, methodology, findings, and identified gaps.

The synthesis involved comparing and contrasting findings across contexts (global, regional, and national) to identify patterns, convergences, and divergences. Rather than aggregating results statistically, the study employed interpretive analysis to draw meaning from the body of evidence and to relate empirical findings to theoretical frameworks and policy expectations in Kenya.

Validity, Reliability, and Trustworthiness: To enhance the credibility of the desk review, the study relied on peer-reviewed sources, authoritative institutional publications, and well-established theoretical texts. Triangulation was achieved by drawing evidence from multiple contexts and types of sources, reducing the risk of bias associated with reliance on a single perspective. Clear documentation of search strategies, inclusion criteria, and synthesis procedures further strengthens the transparency and trustworthiness of the methodology.

Ethical Considerations: As a desk review study, this research did not involve human participants and therefore did not require ethical clearance for data collection. Nevertheless, ethical standards were upheld through accurate representation of authors' ideas, proper citation of all sources in accordance with APA 7 guidelines, and avoidance of plagiarism.

1.10 Study Findings

This section presents the findings of the desk review based on a synthesis of global, regional, and Kenyan literature on the influence of teacher competence on learners' acquisition of critical thinking and problem-solving skills. Consistent with desk review methodology, the findings are interpretive and evidence-based, drawing exclusively from existing empirical studies, theoretical analyses, and policy reports. The findings are organized thematically to reflect how different dimensions of teacher competence shape learner cognitive outcomes.

Teacher Pedagogical Competence and Learner Cognitive Engagement

The desk review establishes that teacher pedagogical competence is a primary driver of learners' opportunities to develop critical thinking and problem-solving skills. Across global and regional studies, teachers who demonstrate strong competence in learner-centred pedagogy such as inquiry-based learning, discussion-oriented instruction, and problem-based tasks consistently create classroom environments that promote reasoning, analysis, and reflection (Furtak et al., 2012; OECD, 2019). These pedagogical approaches require teachers to move beyond transmission of content toward facilitation of thinking processes.

In contrast, studies from Africa and Kenya indicate that limited pedagogical competence often results in continued reliance on teacher-centred instruction, even where curriculum frameworks advocate higher-order learning (Schweisfurth, 2015; Momanyi & Rop, 2019). In such contexts, learners have fewer opportunities to engage in sustained problem-solving or to articulate and defend ideas, constraining the development of critical thinking skills.

Teacher Questioning Skills and Classroom Discourse

A consistent finding across the reviewed literature is the central role of teacher questioning competence in fostering critical thinking. Studies from Asia, North America, and Africa show that teachers who deliberately use higher-order questioning, asking learners to explain reasoning, compare alternatives, or justify solutions, stimulate deeper cognitive engagement (Song, 2019; Ho, 2022). Classroom discourse structured around open-ended questioning enables learners to practice reasoning as a social and cognitive process.

However, the desk review also reveals that in many Kenyan classrooms, questioning practices remain predominantly recall-oriented, reflecting limited training in questioning strategies and pressure to cover examinable content (Opondo, 2023). This finding suggests that teacher competence in questioning is not merely a technical skill but a critical pedagogical lever shaping learners' thinking habits.

Assessment Literacy and Development of Problem-Solving Skills

The desk review identifies teacher assessment literacy as a decisive factor influencing learners' acquisition of problem-solving skills. International and regional evidence shows that formative assessment practices—such as timely feedback, use of rubrics, and assessment of reasoning processes—support learners in refining problem-solving strategies and reflecting on errors (OECD, 2019; HEQCO, 2014). Teachers with strong assessment competence are better able to recognize evidence of thinking, not just correct answers.

In Kenya, however, multiple studies indicate that teachers face challenges in assessing higher-order skills, often defaulting to assessments that reward procedural correctness rather than reasoning (Heto, 2020; Ongesa, 2020). This misalignment between instructional intent and assessment practice limits the reinforcement of critical thinking and problem-solving, as learners tend to focus on what is assessed.

Professional Development and Sustained Teacher Competence

The desk review finds that sustained, practice-based professional development is essential for strengthening teacher competence in promoting higher-order thinking. Evidence from the USA, Canada, and East Africa indicates that professional development models that include coaching, collaborative lesson planning, and classroom-based support are more effective in changing teaching practices than short-term workshops (Brandt et al., 2013; Hardman et al., 2017).

In the Kenyan context, studies suggest that while teachers receive orientation on curriculum reforms, ongoing support focused on pedagogy and assessment for critical thinking remains limited (Momanyi & Rop, 2019). As a result, gains in teacher competence are often uneven and difficult to sustain, affecting consistency in learner outcomes.

Systemic and Contextual Factors Shaping Teacher Competence

Beyond individual teacher skills, the desk review highlights the influence of systemic and contextual factors on teacher competence and learner outcomes. Large class sizes, limited instructional resources, and examination-driven accountability structures constrain teachers' ability to implement pedagogies that foster critical thinking and problem-solving (UNESCO, 2017; Schweisfurth, 2015). Even competent teachers may struggle to sustain inquiry-based practices in such conditions.

In Kenya, institutional support through instructional leadership and school culture emerges as a mediating factor. Schools with strong leadership that prioritizes professional learning and reflective practice are better positioned to support teachers in developing and applying competencies that promote higher-order thinking (Hardman et al., 2017; Brookings, 2025).

Summary of Key Findings

In summary, the desk review finds that:- Teacher pedagogical competence strongly influences learners' opportunities to develop critical thinking and problem-solving skills; Competence in questioning and classroom discourse is central to fostering higher-order cognitive engagement; Assessment literacy determines whether problem-solving and critical thinking are meaningfully reinforced; Sustained professional development is more effective than episodic training in strengthening teacher competence; and Systemic constraints and institutional support structures significantly mediate the relationship between teacher competence and learner outcomes.

Collectively, these findings demonstrate that learner acquisition of critical thinking and problem-solving skills in Kenya is closely tied to the depth, consistency, and support of teacher competence, reinforcing the need for coherent, system-level strategies to improve instructional quality.

Discussion of the Findings

This section interprets the findings of the desk review by situating them within established theory, empirical literature, and the Kenyan education policy context. Rather than restating results, the discussion explains how and why teacher competence shapes learners' acquisition of critical thinking and problem-solving skills, and why these processes remain uneven across contexts.

Teacher Pedagogical Competence and the Development of Higher-Order Thinking

The desk review confirms that teacher pedagogical competence is the primary mechanism through which critical thinking and problem-solving are cultivated in classrooms. Empirical evidence from the USA and other high-income contexts shows that inquiry-based and problem-oriented pedagogies, when competently implemented, provide learners with repeated opportunities to analyse, reason, and apply knowledge (Furtak et al., 2012; OECD, 2019). These findings strongly align with constructivist learning theory, which posits that higher-order thinking emerges through active engagement with meaningful tasks (Piaget, 1972; Vygotsky, 1978).

However, African and Kenyan studies suggest that such pedagogical practices are not consistently enacted due to limitations in teacher competence and contextual constraints (Schweisfurth, 2015;

Momanyi & Rop, 2019). In many Kenyan classrooms, instructional routines continue to prioritise content delivery and examination preparation, reducing opportunities for learners to engage in sustained problem-solving. This discussion reinforces the argument that curriculum reforms alone cannot transform learning; teachers' capacity to enact learner-centred pedagogy determines whether critical thinking becomes a lived classroom experience or remains a curriculum ideal (Heto, 2020).

Teacher Questioning and Classroom Discourse as Engines of Thinking

A key discussion emerging from the findings concerns teacher questioning competence and classroom discourse. Studies across Asia, North America, and Africa demonstrate that teachers who deliberately use higher-order questions such as "why," "how," and "what if" create cognitive demand that stimulates learners' reasoning and problem-solving (Song, 2019; Ho, 2022). These findings support socio-constructivist perspectives that view thinking as socially mediated through dialogue and interaction (Vygotsky, 1978).

In contrast, Kenyan studies indicate that questioning practices often remain recall-focused, with learners expected to reproduce correct answers rather than explain reasoning (Opondo, 2023; Ongesa, 2020). This pattern reflects not only gaps in teacher competence but also systemic pressures such as large class sizes and time constraints. The discussion therefore suggests that improving questioning practices requires more than awareness; it demands explicit pedagogical training, modelling, and institutional support that legitimize dialogue and exploration as valued classroom practices.

Assessment Literacy and Reinforcement of Problem-Solving Skills

The findings further highlight teacher assessment literacy as a decisive factor shaping learners' problem-solving skills. International evidence shows that formative assessment practices feedback, rubrics, and assessment of reasoning processes support learners in refining strategies and reflecting on errors, which are essential components of problem-solving (OECD, 2019; HEQCO, 2014). When assessment focuses on *how* learners think rather than merely *what* they answer, learners are encouraged to engage more deeply with cognitive tasks.

However, Kenyan literature consistently reports misalignment between instructional intentions and assessment practices, with many teachers assessing procedural correctness rather than reasoning (Heto, 2020; Momanyi & Rop, 2019). This discussion supports systems theory, which emphasizes that pedagogy and assessment must be aligned for reforms to succeed (Bronfenbrenner, 1979). Even competent teachers may struggle to prioritise higher-order thinking if assessment regimes implicitly reward memorization. This reinforces the need for coherence between classroom assessment practices and national competency expectations articulated by the Kenya Institute of Curriculum Development and the Kenya National Examinations Council.

Professional Development and the Sustainability of Teacher Competence

The discussion also underscores that teacher competence is not static; it develops through sustained professional learning. Evidence from the USA, Canada, and East Africa indicates that professional development models embedded in classroom practice such as coaching, peer collaboration, and reflective

inquiry are more effective in supporting pedagogical change than one-off workshops (Brandt et al., 2013; Hardman et al., 2017). These models allow teachers to experiment with strategies that promote critical thinking and receive feedback over time.

In Kenya, however, the literature suggests that professional development often focuses on curriculum orientation rather than deep pedagogical practice (Momanyi & Rop, 2019). This discussion implies that without sustained support, gains in teacher competence may be short-lived, limiting long-term impact on learner thinking. The findings therefore support global evidence that teacher competence development must be continuous, practice-based, and context-sensitive if it is to meaningfully influence learner outcomes (OECD, 2019).

Systemic Conditions, Equity, and Uneven Learner Outcomes

A critical discussion point emerging from the desk review is that teacher competence operates within broader systemic and contextual conditions. Studies across Africa and East Africa show that large class sizes, limited resources, and examination-driven accountability structures constrain teachers' ability to implement pedagogies that foster critical thinking and problem-solving (Schweisfurth, 2015; UNESCO, 2017). Even well-prepared teachers may struggle to sustain inquiry-based practices under such conditions.

In the Kenyan context, disparities in instructional resources and leadership support mean that learners' opportunities to develop higher-order thinking vary significantly across schools (Brookings, 2025). This discussion raises important equity concerns. If critical thinking and problem-solving are central educational goals, system-level support must ensure that all teachers particularly those in under-resourced settings have the conditions necessary to practice effective pedagogy. Otherwise, competency-oriented reforms risk deepening existing learning inequalities.

Summary of the Discussion

Overall, the discussion demonstrates that teacher competence is the central conduit through which learners acquire critical thinking and problem-solving skills, but its effectiveness depends on assessment alignment, professional development structures, and systemic support. The findings reinforce theoretical perspectives that emphasize active learning and instructional coherence while highlighting contextual barriers that complicate implementation in Kenya.

The discussion therefore supports a key conclusion of this desk review: strengthening learner acquisition of critical thinking and problem-solving skills requires a coherent, system-level approach that integrates teacher competence development with assessment reform, instructional leadership, and equity-focused support.

1.11 Conclusion

This study set out to examine how teacher competence influences learners' acquisition of critical thinking and problem-solving skills in Kenya by reviewing global, regional, and national literature. The study concludes that teacher competence is the central conduit through which higher-order thinking skills are cultivated in classrooms, confirming strong alignment between theory, empirical evidence, and

policy aspirations. Across contexts, competent teachers those with strong pedagogical content knowledge, effective questioning skills, and assessment literacy are more likely to create learning environments that challenge learners to analyze, reason, and solve problems meaningfully (Furtak et al., 2012; OECD, 2019).

However, the review also establishes that the realization of these competencies in Kenyan classrooms remains uneven and context-dependent. While national curriculum frameworks clearly prioritise critical thinking and problem-solving as core competencies, classroom practices are often constrained by limited pedagogical support, assessment practices that emphasize recall, and systemic pressures such as large class sizes and resource disparities (Momanyi & Rop, 2019; Schweisfurth, 2015). This misalignment reinforces systems theory arguments that curriculum intentions alone cannot transform learning outcomes without coherence across pedagogy, assessment, leadership, and support structures (Bronfenbrenner, 1979).

Overall, the desk review concludes that Kenya's ambition to develop learners who can think critically and solve problems is theoretically sound and policy-supported, but its success depends on sustained investment in teacher competence and system-level alignment. Without such coherence, critical thinking and problem-solving risk remaining unevenly developed, benefiting learners in advantaged contexts more than those in under-resourced schools.

1.12 Recommendations

Based on the reviewed evidence from this desk review, several recommendations are advanced to strengthen the role of teacher competence in promoting critical thinking and problem-solving skills in Kenya.

First, there is a need to prioritise sustained, practice-based teacher professional development focused explicitly on pedagogies that foster higher-order thinking. Professional learning should go beyond curriculum orientation to include coaching, collaborative lesson planning, and reflective practice that help teachers design inquiry-based tasks, manage classroom discourse, and assess reasoning processes effectively (Brandt et al., 2013; Hardman et al., 2017). Such approaches are more likely to translate policy expectations into consistent classroom practice.

Second, assessment literacy should be strengthened to ensure that critical thinking and problem-solving are meaningfully reinforced. Teachers require clearer guidance, exemplars, and support in assessing reasoning, strategy use, and reflection rather than procedural correctness alone. Stronger alignment between classroom assessment and national competency expectations, as articulated by the Kenya Institute of Curriculum Development and operationalized through the Kenya National Examinations Council, is essential for sustaining learner engagement in higher-order thinking.

Third, instructional leadership at school level should be strengthened. Evidence from East Africa and Kenya shows that school leaders play a mediating role in supporting pedagogical change by fostering collaborative cultures, prioritizing professional learning, and legitimizing learner-centred practices (Hardman et al., 2017). Leadership development programmes should therefore equip school leaders with

the skills needed to support teachers in implementing pedagogies that promote critical thinking and problem-solving.

Fourth, the desk review underscores the importance of equity-sensitive implementation strategies. Policymakers and education authorities, including the Ministry of Education, should ensure that teachers in under-resourced schools receive targeted support in terms of professional development, instructional materials, and manageable teaching conditions. Without such measures, disparities in teacher competence and learning conditions may translate into unequal learner outcomes.

Future Research

Future research on the influence of teacher competence on learners' acquisition of critical thinking and problem-solving skills in Kenya should prioritise outcome-focused and longitudinal studies that move beyond perceptions and implementation challenges. There is a need for empirical research that directly measures learners' critical thinking and problem-solving development over time and explicitly links these outcomes to specific dimensions of teacher competence, such as pedagogical strategies, questioning practices, and assessment literacy. Such studies would provide stronger causal evidence to inform teacher education, professional development, and curriculum refinement.

In addition, future research should adopt context-sensitive and system-oriented approaches that account for variations across school types, regions, and resource levels. Comparative studies examining how instructional leadership, assessment regimes, and professional learning structures mediate the relationship between teacher competence and learner outcomes would be particularly valuable. By aligning research designs with national competency frameworks, future studies can generate actionable evidence that supports equitable and sustainable development of critical thinking and problem-solving skills across Kenyan classrooms.

References

Brandt, C., Farmer, J., Kucharz, T., & Sturtevant, E. (2013). *The impact of eMINTS professional development on teacher instruction and student achievement*. University of Missouri.

Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Harvard University Press.

Brookings Institution. (2025). *Learning what matters in Kenya: Defining and measuring core competencies*. Brookings Global Education.

Furtak, E. M., Seidel, T., Iverson, H., & Briggs, D. C. (2012). Experimental and quasi-experimental studies of inquiry-based science teaching: A meta-analysis. *Review of Educational Research, 82*(3), 300–329. https://doi.org/10.3102/0034654312457206

Hardman, F., Ackers, J., O'Sullivan, M., & Abrishamian, N. (2017). Developing a systemic approach to teacher education in sub-Saharan Africa: Emerging lessons from Kenya and Tanzania. *Comparative Education, 53*(4), 476–494. https://doi.org/10.1080/03050068.2017.1338646

Heto, P. (2020). Competency-based curriculum reform in Kenya: Issues and challenges. *Journal of Popular Education in Africa, 4*(9), 5–17.

Higher Education Quality Council of Ontario. (2014). *Evaluating critical thinking and problem solving in large classes: Model-eliciting activities in engineering*. HEQCO.

Ho, P. (2022). Teachers' questioning techniques and students' critical thinking skills in classroom discourse. *International Journal of Instruction, 15*(2), 379–396.

Kenya Institute of Curriculum Development. (2017). *Basic education curriculum framework*. KICD.

Momanyi, J. M., & Rop, N. K. (2019). Teacher preparedness for the implementation of competency-based curriculum in Kenya. *Journal of Education and Practice, 10*(9), 1–10.

OECD. (2019). *Future of education and skills 2030: OECD learning compass 2030*. OECD Publishing. https://doi.org/10.1787/5cff20d0-en

Ongesa, F. (2020). Critical thinking skill gap in the Kenyan educational curriculum. *African Journal of Education and Practice, 6*(2), 45–58.

Opondo, R. O. (2023). Challenges encountered by Kenyan teachers in implementing a competency-based curriculum. *International Journal of Education and Research, 11*(4), 89–102.

Piaget, J. (1972). *The psychology of the child*. Basic Books.

Salinitri, G. (2018). Inquiry-based learning and the development of critical thinking in Canadian science classrooms. *Canadian Journal of Science, Mathematics and Technology Education, 18*(3), 256–272.

Schweisfurth, M. (2015). Learner-centred pedagogy in international education. *International Journal of Educational Development, 40*, 259–266. https://doi.org/10.1016/j.ijedudev.2014.10.006

Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher, 15*(2), 4–14. https://doi.org/10.3102/0013189X015002004

Song, Y. (2019). The influence of teachers' questioning strategies on students' critical thinking skills. *Asia-Pacific Education Researcher, 28*(3), 253–262.

Tabulawa, R. (2013). *Teaching and learning in context: Why pedagogical reforms fail in Botswana*. CODESRIA.

UNESCO. (2017). *Global education monitoring report 2017/18: Accountability in education Meeting our commitments*. UNESCO Publishing.

UNESCO. (2024). *Competency-based curricula in Eastern and Southern Africa: Policy and practice*. UNESCO Regional Office for Eastern Africa.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.