

UNLOCKING
CBE
COMPETENCIES
—THROUGH—
**CRITICAL
THINKING**
AN EDUCATOR'S GUIDE

TOM DESTINY NAMWAMBAH



BlueRose**ONE**.com
S t o r i e s M a t t e r
New Delhi • London

BLUEROSE PUBLISHERS

India | U.K.

Copyright © Tom Destiny Namwambah 2026

All rights reserved by author. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission of the author. Although every precaution has been taken to verify the accuracy of the information contained herein, the publisher assumes no responsibility for any errors or omissions. No liability is assumed for damages that may result from the use of information contained within.

BlueRose Publishers takes no responsibility for any damages, losses, or liabilities that may arise from the use or misuse of the information, products, or services provided in this publication.



For permissions, requests or inquiries regarding this publication,
please contact:

BLUEROSE PUBLISHERS
www.BlueRoseONE.com
info@bluerosepublishers.com
+91 8882 898 898
+4407342408967

ISBN: 978-81-6744-690-9

Cover Design: Deepak Katheria
Typesetting: Manisha Rawat

First Edition: October 2026

Dedication

The unrelenting educators in
Kenya - true ignition of intellectual potency

Acknowledgement

To the educators of Kenya,
The silent pillars of our land,
Who shape the minds that serve and save the nation,
With steady heart and guiding hand.

In the spirits of those whom you labour to produce,
You step into classrooms day by day,
To sow the seeds of competence,
Though minimal rewards come your way
In their souls eternally you dwell.

You carry the weight of our tomorrow,
Unmatched by the recognitions of government gold,
Yet you look beyond the heavy sorrow,
To values that can't be bought or sold.

Your sacrifice is the nation's foundation,
Your wealth is the future you proudly raise,
To Kenya's teachers, we give our devotion,
Beyond the silence of official praise.

In you we confide, by you we stand,
Our anchor through the shifting tide,
In unlimited words across the land,
We honour you with boundless pride.

Preface

The Kenyan educational landscape is undergoing its most monumental shift since independence. As the nation transitions from the examination-heavy 8-4-4 system to Competency-Based Education (CBE) frameworks, the metrics of learner success are being fundamentally redefined. Under the stewardship of regulators like the Kenya National Qualifications Authority (KNQA) and the Commission for University Education (CUE), education is no longer a race for rote memorization. Instead, it is a deliberate journey to nurture holistic capabilities, values, and real-world skills. At the absolute heart of this transformation lies the critical faculty - the cognitive engine that empowers learners to process information independently, ethically, and productively.

This handbook, *Unlocking CBE Competencies through Critical Thinking: An Educator's Guide* serves as an essential manual for educators navigating this terrain across the crucial upper tiers of Kenya's academic continuum. It spans from Senior School (Grades 10–12) pathways through to University and Tertiary Education. These developmental stages represent a vital transition. In Senior School, learners specialize within distinct learning pathways - STEM, Social Sciences, or Creative Arts and Sports. In Higher Education, they refine these disciplines into professional mastery under the guidelines of the University Competency-Based Education Framework (UCBEF).

Crucially, this guide operates on the principle that the critical faculty cannot be taught as an isolated, abstract concept. Grounded in the core pillars of the UCBEF, the critical faculty must be explicitly cultivated through critical thinking across all subject domains via a blend of skills, values, and practical learning. Higher education institutions are shifting away from traditional lecture-heavy instructional formats. Instead, they are embracing an architecture oriented toward measurable Learning Outcomes,

where students active-learn through Project-Based Learning, Experiential Tasks, and Community-Based Research. Critical thinking looks different in every discipline:

- **In the STEM Pathways**, it manifests as algorithmic logic, rigorous hypothesis testing, and empirical data verification.
- **In the Social Sciences and Humanities**, it demands source criticism, systemic analysis, and the weighing of socio-historical perspectives.
- **In the Creative Arts and Languages**, it drives deep textual critique, aesthetic evaluation, and original conceptual expression.

By embedding critical inquiry into daily instructional designs, educators directly bridge the gap between academic theory and practical application. This alignment fulfills the UCBEF vision of creating graduates who value Practical Exposure and Industry Attachment. Furthermore, it supports progression across the Kenya National Qualifications Framework (KNQF) Level Descriptors, ensuring that clear evidence of advanced cognitive skills replaces mere seat time.

To systematically guide educators through this paradigm shift, this handbook is structured into nine distinct, interconnected thematic areas:

- i. **Principles of Competence Based Education - CBE:** Unpacks the foundational logic of the CBC/CBE shift in Kenya. This section details how traditional time-bound progression is replaced by demonstrated mastery of outcomes, self-pacing, and student-centered flexible pathways.
- ii. **Understanding Critical Thinking:** Explores critical thinking and problem-solving as one of Kenya's primary Core Competencies. It defines the cognitive skills needed - such as reasoning, objective judgment, and evidence-gathering. This helps students' move past subjective opinion into disciplined, judicious, and analytical thought.

- iii. **Critical Thinking - The Foundational Pillar to CBE:** Examines critical thinking as the foundational pillar of Competency-Based Education (CBE) by shifting the educational focus from passive rote memorization to the active, real-world application of knowledge, it weighs on CBE framework, asserting that students must demonstrate measurable mastery of specific skills and competencies rather than merely accumulating credit hours. It views critical thinking as the engine for this mastery, empowering learners to analyze complex scenarios, evaluate diverse evidence, and solve unpredictable, authentic problems independently.
- iv. **Essentials of Education in the Critical Faculty:** Deeply examines how to nurture the internal dispositions of a fair-minded thinker. It introduces methods to align the Universal Intellectual Standards (clarity, accuracy, precision, depth, and logic) with specific Kenyan academic disciplines and subject areas.
- v. **Pedagogy for Critical Thinking:** Delves in the instructional design framework changes. It introduces active learning methodologies, including Socratic questioning, Project-Based Learning, case-study analysis, and reconstructivist classroom approaches tailored for lecture halls and high school classrooms.
- vi. **Teach for Critical Thinking:** Focuses on awakening the mind from the slumber of rote compliance, transforming inquiry from a static, isolated subject into a dynamic, subject-specific ecosystem across Senior School tracks, tertiary colleges, and University education. Rather than reducing thought to a common introductory unit, this paradigm cultivates critical awareness as the living, connective tissue embedded within the unique truth-claims of every discipline. To achieve this, educators must reject pre-packaged certainty and intentionally design unmapped intellectual terrains where students are forced to reconcile

conflicting epistemologies. Ultimately, the true value and manifestation of this capacity lies in a learner's ability to navigate structural ambiguity, deciphering complex realities with independent ethical agency and holistic, cross-disciplinary understanding.

vii. **Operationalizing the Critical Thinking Engine in CBE at Higher Education:**

Addresses the requisite structural shift from passive knowledge retention to active, measurable skill acquisition. It posits that Higher education institutions must intentionally align curriculum frameworks with explicit critical thinking competencies rather than leaving intellectual growth to chance. It views Faculty as critical players who must transform their instructional delivery from traditional lectures into guided, inquiry-based facilitation; while the students are required to engage with authentic, real-world problems that demand deep analysis, rigorous evaluation, and complex problem-solving. It avers that as an operational engine, critical thinking relies heavily on continuous, formative assessment mechanisms that capture performance in real time. Rather than relying on high-stakes, summative examinations that merely test recall, an operationalized critical thinking engine demands iterative feedback loops, transparent rubrics, and scaffolded reflection. This continuous evaluation ensures that competencies are not just demonstrated statically, but are progressively refined, measured, and mastered throughout the learner's academic journey.

viii. **Critical Thinking as Subject-Domain Specific:**

Examines the delicate balance between embedding analytical reasoning directly within specific academic fields to build context-rich expertise and recognizing that critical thinking must ultimately be secured as a universal, lifelong capability through a centralized university common unit. This approach acknowledges that while Competency-Based Education correctly grounds critique within the unique

rules and practical demands of individual disciplines, isolating these skills entirely risks leaving a student's cognitive abilities fragmented and trapped within professional silos. By establishing a dedicated, cross-disciplinary space for macro-level synthesis alongside subject-specific infusion, higher education ensures that learners can decouple their analytical tools from specialized tasks, translating deep disciplinary insights into a cohesive, adaptable problem-solving framework necessary for navigating the broader human condition and civic life.

- ix. **Assessment Methods for Competence-Based Education (CBE):** Focuses on the tools used in evaluating and assessing actual students learning. It focuses on tools such as the authentic performance task, which includes case study analyses, simulations, and problem-based projects that force students to diagnose complex problems and propose data-driven solutions under realistic conditions; while evidence-based portfolios, such as reflective journals and curated work collections, which require students to document and defend their reasoning process over time is recommended to track long-term cognitive growth. Finally, structured evaluation tools like analytic rubrics and Objective Structured Clinical Examinations (OSCEs), which objectively score specific competencies like the ability to isolate assumptions, weigh evidence, and formulate logical conclusions is used to measure behaviors.

By equipping educators with these tools, we do more than prepare students for specialized careers. We shape a generation of intellectually independent, innovative, and ethically grounded citizens capable of driving Kenya's socio-economic advancement and navigating global complexities. We hope this handbook serves as a powerful, transformative companion in your teaching practice as you unlock the true potential of our learners.

Dr. Patrick Chiriswa Andika

Kenya Institute of Curriculum Development (KICD)

Contents

Section One

Principles of Competence Based Education – CBE	1
1.0 Introduction.....	1
1.1 The Birth of Competence Based Education - CBE	1
1.2 Challenges to CBE System	2
1.3 Philosophical Pillars of CBE	4

Section Two

Understanding Critical Thinking.....	10
2.0 Introduction.....	10
2.1 Definitions of Critical Thinking.....	12
2.2 Critical Thinking Traits.....	22
2.3 Value and Importance of Critical thinking	25
2.4 Essential Characteristics of Critical thinkers	28

Section Three

Critical Thinking - The Foundational Pillar to CBE	30
3.0 Introduction.....	30
3.1 CBC Competences.....	31
3.2 Effect of CBE on University Curriculum	34
3.3 Critical Thinking: The Cognitive Architecture of CBE..	37

Section Four

Essentials of Education in the Critical Faculty.....	42
4.0 Introduction.....	42
4.1 Definition of Education.....	42
4.2 Role of Education in the Critical Faculty.....	44
4.3 Skills, Dispositions, and Attitudes for Education in the Critical Faculty	47
4.4 Relevance of Critical Thinking to CBE in Kenya	52

Section Five	
Pedagogy for Critical Thinking.....	55
5.0 Introduction.....	55
5.1 Instructions for Critical Thinking	55
Section Six	
Teach For Critical Thinking.....	65
6.0 Introduction.....	65
6.1 Teach Critical Thinking	66
6.2 Teach <i>For</i> Critical Thinking	66
6.3 Value of Teach for Critical thinking.....	70
6.4 How to Teach Learners to Think Critically.....	72
6.5 Manifestation of Critical Thinking abilities	75
6.6 Frameworks of Teaching for Critical Thinking.....	77
Section Seven	
Operationalizing CBE Critical Thinking Engine at Higher Education	80
Section Eight	
Critical Thinking as Subject Specific Ecosystem	87
8.0 Introduction.....	87
8.1 Educator Prompts to Trigger Domain-Specific Critique.....	91
8.2 Synthesizing the Embedded Paradigm	92
8.3 Re-Engineering the Educator Mindset	94
8.4 The Synthesis Arena	96
Section Nine	
Assessment Methods for Competence-Based Education (CBE).....	98
9.0 Introduction.....	98
9.1 Cross-Disciplinary Assessment Criteria for CBE	99
9.2 Universal Performance-Based Assessment Models.....	102
9.3 Domain-Agnostic Process Assessments.....	105
9.4 Collaborative Critique and Co-Assessment.....	108
9.5 Scalability, Bias, and the AI Challenge	110

9.6 Synthesizing Assessment for the Future Mind	113
9.7 CBE Subject-Specific Assessment Criteria	114
Appendices	122
References	136
Recommended Journal Articles	138
Annex: Leveraging Critical Thinking Pedagogies for CBE	
Competency Mastery.....	139

SECTION ONE

Principles of Competence Based Education – CBE

1.0 Introduction

Competency-Based Education (CBE) is Kenya's current educational model that focuses on a student's measurable mastery of specific knowledge, skills, and behaviors, rather than the amount of time spent in a classroom. It moves educational objectives from the previous content laden 8-4-4 system that was imbued in content, memorization, rote learning and classroom competition, to an educational system that promotes a flexible, learner-centered approach designed around real-world applications.

1.1 The Birth of Competence Based Education - CBE

Kenya's shift to Competency-Based Education (CBE) evolved from the initial Competency-Based Curriculum (CBC) that began in 2017 to replace the rigid, exam-oriented 8-4-4 system. The system introduced a 2-6-3-3-3 structure of education which focuses on developing practical skills through continuous assessment, projecting specialized career pathways which are determined on the learners' transition to senior schools, then to higher institutions of learning.

Historical Milestones

- *1985 (The 8-4-4 Era):* 8-4-4 system was introduced to foster self-reliance, but gradually grew heavily exam-driven and focused on rote memorization.
- *2017 (Introduction of CBC):* The government declared 8-4-4 system untenable, thereby introducing CBC (2-6-3-3-3) with a phased rollout framework under the Kenya Institute

of Curriculum Development (KICD) to prioritize practical competencies over pure theory and rote learning as evidenced under the 8-4-4 system.

- *2025 (Refinement into CBE):* CBC formally streamlined to cut bureaucracy, balance continuous assessments, and reintroduce targeted flexibility like practical mathematics.
- The same year, 2025 witnesses the pioneering classes under the competency framework officially enter Senior Secondary School (SSS) pathways.

This transition has marked a radical and structural shift in Kenya's education system. The old model of 8-4-4 has been replaced with 2 years of pre-primary, 6 years of primary, 3 years of junior school, and 3 years of senior school. In this new system, emphasis is put on real-world application, values, and talent nurturing over high-stakes single examinations. The system is defined by various dynamic pathways and structural design available to students in Kenya's education landscape.

1.2 Challenges to CBE System

Since its inception, this shift has come at a cost as various challenges and bottlenecks continue to emerge. They range from deep structural, financial, and cultural hurdles. Basic to these challenges by public schools, educators, and families include:

1. Inadequate School Infrastructure

- *Missing Laboratories:* Specialized senior school tracks like STEM suffer heavily from a widespread lack of functional science labs and technology workshops.
- *Overcrowded Classrooms:* High student enrolment outpaces physical expansion, leading to heavily congested classrooms that restrict practical, hands-on learning.
- *Unequal Resource Distribution:* Digital tools and textbooks remain highly scarce in rural and marginalized communities compared to urban schools.

2. Teacher Gaps and Workload Pressures

- *Rushed retraining:* Many veteran educators received brief, superficial training workshops, leaving them ill-prepared to teach learner-centered pedagogies.
- *Severe understaffing:* Public schools face chronic shortages of specialized teachers trained for specific technical, artistic, or science-based tracks, forcing non-knowledgeable teachers to be assigned to teach.
- *Administrative fatigue:* Transitioning from exam scoring to tracking continuous assessments, student portfolios, and projects creates massive administrative burdens.

3. Financial Burden and Parent Confusion

- *Escalating costs:* Practical assignments force parents to consistently purchase expensive learning materials, printing services, and craft tools.
- *Misunderstood parental roles:* Many households struggle to assist with complex, homework-heavy project requirements due to unfamiliarity with the system.
- *Pathway chaos:* Students frequently choose senior school career pathways based on social peer pressure or parental desires, leading to massive waves of students requesting to change tracks when they transit to senior schools. This is likely to reflect more when they get to universities.

4. Systemic and Transition Friction

- *Placement gaps:* The transition to Grade 10 senior schools has triggered massive systemic backlogs and delayed school reporting for hundreds of thousands of learners due to placement inefficiencies.
- *Inequality gaps:* Wealthier families easily fund out-of-school technical training and private resources, leaving underprivileged public school students at a distinct disadvantage

- Despite these challenges, teachers, education administrators, and parents continue to struggle to find relevance and best practices to implementing CBE. It is anticipated that eventually, the dust will settle and we will find our way.

1.3 Philosophical Pillars of CBE

The founding philosophy of Competency-Based Education (CBE) centres on shifting instruction from passive, time-bound content delivery to the active, demonstrable mastery of practical skills, knowledge, and attitudes. Rather than measuring success by seat-time, CBE prioritizes what a learner can actually *do*.

The core pillars include

- *Pragmatism*: Grounded in John Dewey's ideals, CBE emphasizes learning-by-doing, experiential problem-solving, and practical application over rote memorization.
- *Constructivism*: CBE views the learner as an active agent who builds personal understanding and competence through interaction with real-world environments and reflection.
- *Progressivism & Humanism*: It focuses on the whole student, prioritizing individual learning styles, personal agency, self-directed pacing, and continuous lifelong adaptability.
- *Social Reconstructionism*: It aims to align educational outcomes directly with societal needs, economic relevance, and the demands of the 21st-century workforce.

Key operational principles of CBE entails:

- *Mastery-Based Progression*: Students advance upon proving competence rather than completing fixed calendar hours.
- *Learner-Centered Design*: Emphasizes customized paths to suit diverse capabilities and prior knowledge; and,

- *Authentic Assessment:* prioritizes evaluating success via practical tasks, portfolios, and observable behavior rather than traditional high-stakes written exams alone.

The system allows students to move forward by demonstrating mastery rather than sitting through traditional class time:

The implementation of Competency-Based Education (CBE) directly translates its founding philosophy into a national framework as the model holistically replaces the traditional, exams-driven 8-4-4 system with an inclusive, learner-centered architecture designed to nurture every learner's potential.

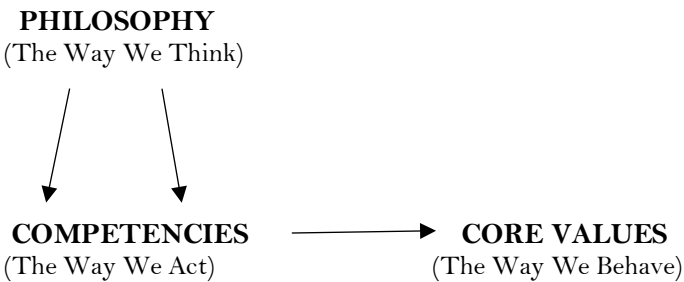
The philosophy in action defining CBE shifts the educational focus from academic memorization to developing practical capacities. It structures learning around seven core competencies, namely:

- *Communication and Collaboration:* Working effectively in teams and sharing ideas clearly.
- *Critical Thinking and Problem Solving:* Analyzing situations to find creative solutions.
- *Creativity and Imagination:* Expressing original ideas through arts, design, and innovation.
- *Citizenship:* Understanding national identity, social justice, and civic responsibilities.
- *Digital Literacy:* Navigating and utilizing technology safely and productively.
- *Learning to Learn:* Developing a passion for lifelong, self-directed knowledge acquisition; and,
- *Self-Efficacy:* Building personal confidence, emotional intelligence, and self-drive.

Although none of these competencies has been pronounced predominant over the others, debates on CBE have put more emphasis on critical thinking and problem solving. Being what it may be, it's evident from educational good practices that the CBE competencies can easily, and only be tenable through the “*teach for critical thinking*”. In this regard, the architects of CBE need to focus

on how, by making critical thinking an umbrella competence to the rest would catapult the development and tenability of all other intended competencies.

The above observation is anchored on the fact that the very founding philosophy of CBE provides the "why," without a substantial trigger, while the seven competencies provide the "how," whereas the core values are presumed to provide the moral "anchor." Together, they form an inseparable triangle, which, again, focus on thinking as the anchor to the actualization of the competencies:



Understanding the practicality of CBE philosophy will solve many of the tailbacks bedeviling the implementation of the educational system. This is because the CBE philosophy inspires values by cultivating the mind into a critical faculty capable of discerning and acting judiciously. The philosophical foundation relies on humanism and progressivism, which treat learners as whole people, not just academic storage units. The core values that include love, responsibility, respect, unity, peace, patriotism, social justice, and integrity are cardinal to this philosophy. Consequently, instead of viewing classmates as competitors to beat in a national ranking, the CBE philosophy demands that learners see each other as human beings deserving of respect and love.

Second, the CBE values ground the competencies in such a way that their interconnectedness adds value to the entire spectrum of education system. In an error where the advance in technology is faster than human comprehension, competencies without moral

values can be dangerous; technology skills without integrity leads to cybercrime, and strong communication without respect leads to manipulation. Values ensure competencies are used ethically.

Third, understanding the value of citizenship, patriotism and social justice is key to building a cohesive, and self-respecting nation. The competency of *Citizenship* (understanding one's community) is of no value without the core values of *Patriotism* and *Social Justice*. This value drives the students to use their citizenship to love, embrace and help others.

Fourth, to effectively *collaborate* (competency), students must actively practice *unity* and *respect* (values) for diverse ideas within their groups. They must learn and appreciate the cultural diversity, thinking, and ways of life of other community members, and take pride in the diverse nature of their society. This is what the values of communication and collaboration, unity and respect is all about.

Fifth, the values of self-efficacy, and responsibility. The competency of *Self-Efficacy* (self-drive and confidence) relies entirely on the core value of *Responsibility* - taking ownership of one's actions, time, and academic progress. Taking ownership means shifting from a passive participant to the driver of your life. By fully owning your actions, time, and academic progress, you stop blaming external factors and start creating real solutions. This mindset builds self-confidence, drives continuous growth, and transforms daily habits into long-term.

Sixth, *digital literacy*, and integrity. Digital literacy and digital integrity are vital tools in the modern world. Digital literacy gives you the skills to find, use, and share information safely using technology. Digital integrity means acting with honesty, respect, and responsibility online. Together, digital literacy, and integrity help people to avoid scams, build trust, and succeed in school, and later at workplace.

In applying digital literacy (competency) to navigate online tools, the learners must anchor it in *Integrity* (value) to avoid plagiarism, cyberbullying, or dishonest digital habits.

The three aspects defining CBE – (philosophy, competencies and values) are, in the real-world application (the output) entwined. When philosophy, competencies, and values align, education moves away from just passing tests. For example, during a Community Service Learning (CSL) project, a student utilizes *Critical Thinking* (competency) driven by *Love and Responsibility* (values) to solve a local pollution issue. This achieves the ultimate *Social Reconstructionist* goal of the CBE philosophy: building a balanced, ethical, and highly skilled society.

The above values are essential to CBE in the sense that they:

- i. *Combat "Intellectual Criminality"*: Developing practical skills like *Digital Literacy* without *Integrity* creates smart cybercriminals. Values ensure that the 21st-century skills are used ethically.
- ii. *Transforms Classrooms into Communities*: Replacing high-stakes exam competition with *Love* and *Unity* encourages students to celebrate each other's diverse pathways and paces rather than seeing peers as rivals.
- iii. *Drives Accountability*: The mastery-based progression of CBE demands that learners take personal *Responsibility* for their assignments, portfolio evidence, and skill development.

Whereas all these CBE competencies are essential, critical thinking and problem-solving represent the *prima facie* master capacity that animates the entire educational cosmos. It functions as the sovereign mind that transforms mechanical skills into instruments of authentic agency across all seven core pillars of Competence Based Curriculum (CBC). Crucially, critical thinking unlocks *communication and collaboration* by shifting peer engagement from passive conformity to a rigorous, respectful dialectic capable of evaluating distinct truth-claims. It bridges raw *digital literacy* with intellectual integrity, transforming tech-savviness from mindless consumption into the ethical curation of algorithmic data. Rather than abandoning *imagination and creativity* to unguided impulse, critical thought anchors innovation by subjecting original ideas to

practical analysis and systemic viability. Furthermore, it elevates *citizenship* beyond blind national compliance, nurturing civic awareness with the moral courage to defend complex ethical choices. By evaluating individual strengths and navigating structural ambiguity, it builds genuine *self-efficacy* through reflective resilience. Ultimately, critical thought catalyzes *learning to learn*, driving the metacognitive pursuit of lifelong inquiry. Far from an isolated skill, critical thinking is the vital connective tissue that transforms these distinct competencies into an active, subject-specific ecosystem of human wisdom.

SECTION TWO

Understanding Critical Thinking

2.0 Introduction

Whereas all CBE competencies are essential, critical thinking is unequivocally the *prima facie* master capacity that animates the entire educational cosmos. It functions as the sovereign mind that directs all other capabilities, transforming them from mechanical skills into instruments of authentic agency. For instance, critical thinking unlocks meaningful communication by shifting it from simple expression to the nuanced parsing of intent, bias, and underlying assumptions. It rescues collaboration from mere group compliance, elevating it into a rigorous dialectic where diverse minds challenge, refine, and synthesize divergent perspectives. Similarly, it transforms information literacy from the passive consumption of data into the active, ethical interrogation of algorithmic landscapes and systemic narratives. Without this analytical anchor, citizenship and social responsibility risk becoming blind conformity; critical thought infuses them with the moral courage to challenge structural injustice and defend complex ethical choices. By acting as the ultimate epistemic catalyst, critical thinking does not merely coexist alongside other competencies; it is the vital connective tissue that breathes intent, depth, and reflective wisdom into them, allowing learners to navigate structural ambiguity and shape an unmapped world through wise, decisive action

We exist within a restless cosmos of perpetual flux, a world where mounting pressures, discordant ideas, and the accelerating velocity of change threaten to fracture human consciousness. The contemporary era spins on its own axis of chaos, constantly undoing its own foundations. In such an age, survival is not a matter of clinging to static truths, but of mastering the art of navigation

through uncertainty. To live deliberately is to cultivate absolute discernment - using the intellect not merely to react, but to dissect complexity, anticipate hidden risks, and forge decisive paths through the noise. Reason is the ultimate architect of human progress; when we think critically, we transmute raw intelligence into a moral force capable of alleviating suffering and engineering a more enlightened world.

It is precisely to meet this existential demand that critical thinking serves as the vital engine of Competency-Based Education (CBE). This paradigm marks the death of passive memorization - a ritual that dulls the mind and replaces it with the vital flame of active analysis. It commands learners to interrogate assumptions, weigh evidence, and confront the raw paradoxes of the real world. Without this philosophical anchor, the framework of competency collapses into empty rhetoric, devoid of the practical wisdom it promises to cultivate. In awakening this intellectual fire, Kenya's educational landscape undergoes a profound metamorphosis, shifting its gaze from the graveyard of rote recollection toward the frontier of purposeful application, focusing on:

- i. *Deep understanding*: Students move past memorizing facts to analyze how and why things work.
- ii. *Active participation*: Learners engage directly with ideas instead of just repeating teacher instructions.
- iii. *Challenging bias*: It teaches students to recognize personal assumptions and look at alternative viewpoints.

In relation to addressing and solving real-world problems, CBE focuses on:

- i. *Practical solutions*: Focuses on real-world challenges where students must dissect complex issues into manageable parts.
- ii. *Inquiry-based growth*: Curiosity is stimulated through active inquiry, driving students to investigate and test hypotheses.

- iii. *Adaptability*: Confident learners use structured reasoning to navigate new, unfamiliar environments and unexpected obstacles.

By stressing the need to prepare students for their future success through critical thinking, CBE stays tuned to the prevailing, and the needs for:

- i. *Workforce demand*: Modern employers heavily value individuals who can reason logically and make sound judgments.
- ii. *Informed decision making*: Students weigh consequences and benefits effectively in both academic and personal choices.
- iii. *Lifelong independence*: It creates self-directed learners who continue to evaluate and improve their own thinking processes over time.

2.1 Definitions of Critical Thinking

The quest to define critical thinking reveals a rich tapestry of perspectives, as the concept eludes a single, universal description. Because its conceptual boundaries naturally shift depending on a scholar's philosophical perspective and disciplinary orientation, it remains a fluid intellectual ideal rather than a static formula. Yet, this diversity of thought does not imply a lack of cohesion. While thinkers across various traditions may diverge on its precise articulation, they remain deeply united by a shared recognition of its essential architecture and principles. At its philosophical core, critical thinking is understood not merely as a mechanical skill or a set of logical rules, but as an active, reflective practice - a disciplined commitment to interrogating the truth, uncovering hidden assumptions, and evaluating the very validity of human thought.

2.1.1 Creativity

Creativity is the ontological architect of cognitive innovation, serving as the essential *a priori* precursor to critical analysis. At its core, the creative impulse is the act of bringing into existence that which did not previously exist, transitioning thoughts from

potentiality to actuality - whether manifested as a tangible product, a novel process, or a new conceptual framework. Rather than a mere *ex nihilo* generation of the unprecedented, it operates via a dialectical reconfiguration of existing paradigms, synthesizing old elements to birth a harmonized, revitalized whole. By offering potential solutions to complex problems and novel explanations for unexplained phenomena, creativity provides the raw phenomenological material that the human intellect requires to engage with the world in a meaningful capacity.

Far from being a separate or secondary cognitive function, creativity operates as the primary teleological engine driving critical thinking. While the analytical mind excels at deductive and inductive reasoning, judging validity, and dissecting epistemic structures, it remains inherently restricted without a diverse spectrum of options to process. Creativity expands the problem-solving horizon by actively shattering mental blocks, dismantling cognitive biases, and facilitating the lateral synthesis of seemingly disparate ideas. By bridging unrelated concepts, the creative impulse generates the unconventional perspectives and varied paths forward that prevent logical reasoning from becoming trapped within the stultifying confines of rigid, outdated assumptions.

Beyond the mere production of alternatives, a creative mindset fundamentally alters the heuristic frameworks through which the intellect navigates uncertainty. It infuses analytical structures with vital intellectual flexibility and open-mindedness, fostering a negative capability - the capacity to tolerate ambiguity and resist the urge to jump to premature conclusions. This fluid approach to cognition actively challenges established orthodoxy, forcing rigid logical systems to stretch, adapt, and interrogate their own unstated dogmas. By reframing the core definition of a problem, creativity completely shifts the conceptual landscape, thereby elevating the depth, trajectory, and ultimate quality of any subsequent critical evaluation.

Ultimately, the relationship between ingenuity and analysis is defined by a profound symbiotic praxis known as the Idea Loop.

While pure creativity lacks the rigorous, disciplined methodology required for refinement, pure critical thinking suffers from a natural deficit of original invention. The two functions operate in a perpetual loop where creativity envisions possibilities and critical thinking filters, tests, and refines them into practical, real-world applications. Through this state of balanced execution, the human mind successfully bridges the chasm between abstract imagination and concrete reality, transforming raw inspiration into sustainable innovation.

2.1.2 Critical thinking

Whereas creative thinking is the architect of possibility, drafting the blueprints for novel solutions and revolutionary explanations where nothing previously existed, operating on imagination, and breaking through cognitive biases to synthesize entirely new ways of looking at a phenomenon, critical thinking is the crucible of validity, subjecting those raw concepts to the flames of reason, evidence, quantification, and rigorous analysis. One expands the horizon by generating choices; the other narrows the focus by filtering out the impractical and the false. Together, they form a flawless intellectual ecosystem where inspiration is systematically transformed into execution.

Philosophy teaches us that the mere acquisition of facts is not the same as true understanding. Critical thinking functions as an intellectual filter, a concept famously extended in institutional educational design by the Manchester Community College General Education Initiative, which emphasizes the active capacity to distinguish objective facts from subjective feelings, isolate personal judgments, and evaluate the structural integrity of inductive and deductive arguments (MCC, 2002). This disciplined process demands that we constantly evaluate our own thinking habits. It asks us to examine the hidden motives, deep-seated prejudices, and native egocentrism that frequently cloud human judgment. Within the framework of CBE, this brand of thinking becomes a profound liberating force. It echoes early progressive paradigms that contrast true reflective inquiry against passive rote learning (Dewey, 1933),

encouraging an active, restless inquiry that values the pursuit of truth far above the fragile comfort of simply being right.

This epistemic shift transforms the classroom from a site of mere transmission into a workshop of active synthesis, where the learner does not merely receive information but interrogates its foundational claims. In the context of Competence-Based Education, knowledge is verified through its operational validity, meaning that an idea is only as valuable as the reasoning that supports its application. By insisting on this rigorous standard, critical thinking breaks down the artificial barriers between different academic subjects, revealing that clarity, accuracy, and sound evidence are universal intellectual values (Paul & Elder, 2001). This deep integration ensures that learners are not simply training for specific vocational tasks, but are developing a comprehensive framework of understanding. They learn to view information not as isolated bytes of data, but as interconnected systems of meaning that demand careful, comprehensive analysis.

True critical thinking requires a rare harmony between sharp cognitive skills and deep moral character. The ideal critical thinker is not a cold, unfeeling machine, but a person driven by an enduring faith in the supremacy of reason, fairness, and empathy. As established in landmark consensus studies on educational evaluation, the ideal critical thinker is characteristically inquisitive, well-informed, and trustful of reason, open-minded, flexible, fair-minded in evaluation, and undoubtedly honest in facing personal biases (Facione, 1990). This path demands intellectual courage and the integrity to confront internal assumptions head-on. It is an ongoing commitment to universal intellectual values such as clarity, precision, consistency, depth, and relevance that rise above specific academic subjects. By blending these mental habits with rigorous analytical skills, the thinker evolves into a resilient seeker of precision, fully prepared to face the unpredictable challenges of the modern world.

As a living philosophy, critical thinking proves its value through action. It bridges the gap between inner reflection and outer reality

by taking two distinct forms: a sharp set of cognitive tools used to process information, and the consistent habit, based on deep intellectual commitment, of using those skills to systematically guide daily behavior (Paul & Elder, 2001). It rejects the superficial exercise of skill for its own sake, demanding instead a complete devotion to what the evidence reveals. By organizing data, asking deep questions, and anticipating potential outcomes, the critical thinker transforms the act of decision-making into a deliberate philosophical art. Here, real-world problem-solving becomes an intentional effort to fulfill the true value of human reason, directly answering the core competency demands of modern, outcome-focused education.

Consequently, this habituation of reason redefines the relationship between the individual and the choices they make in a complex world. When critical thinking transitions from an occasional mental exercise into an established lifestyle, it alters how an individual interacts with social, economic, and political systems. The learner becomes hyper-aware of cognitive biases, propaganda, and emotional manipulation, developing a cognitive immunity to superficial rhetoric. In a contemporary landscape flooded with conflicting narratives, this self-rectifying nature of critical thought serves as an intellectual anchor. It empowers individuals to suspend belief when evidence is lacking, to remain open to alternative cultural paradigms, and to adjust their conclusions when faced with superior data, establishing a reliable pathway to accurate and actionable knowledge.

Ultimately, unlocking CBE competencies through critical thinking means nurturing the essential spirit of a rational, just, and democratic society. Within Kenya's educational transformation, critical thinking serves as the vital link connecting personal growth to active civic duty. It provides the essential tools of inquiry that turn learners into self-correcting, well-informed citizens who are prudent in judgment and flexible in perspective. By anchoring education in this ultimate standard of truth, we do more than just prepare students for the workforce. We cultivate the vital

intellectual virtues necessary to sustain human dignity, advance social justice, and expand the boundaries of human potential

2.1.3 Characteristics of Critical Thinking

Wade (1995) identifies eight foundational characteristics that anchor critical thinking within the architecture of Competence Based Education (CBE). Rather than treating intelligence as a passive repository of knowledge, this framework operationalizes critical thinking as an active, iterative inquiry process structured around distinct cognitive movements. The process begins with asking questions to challenge premises and probe underlying mechanics, followed by defining a problem to strip away superficial symptoms and expose the core issue. Thinkers must then engage in examining evidence by gathering and parsing data for structural validity, while concurrently analyzing assumptions and biases to surface unstated beliefs and systemic distortions. To maintain objectivity, the process demands avoiding emotional reasoning to decouple cognitive judgment from affective impulses, and avoiding oversimplification to resist the urge to reduce intricate systems to binary conclusions. Finally, it requires considering other interpretations by actively exploring alternative paradigms, and tolerating ambiguity to maintain analytical composure when facts are incomplete or contradictory.

The capacity to navigate ambiguity is not merely a passive coping mechanism; it is an active epistemic virtue. As Strohm & Baukus (1995) observe, *"ambiguity and doubt serve a critical-thinking function and are a necessary and even a productive part of the process."* Within CBE, where training is explicitly aligned with real-world application, this characteristic becomes indispensable. Authentic professional and civic problems are rarely neat or pre-packaged; they are intrinsically muddled, evolving, and frequently devoid of singular, correct answers. Sustaining doubt prevents the thinker from rushing into premature, conceptually frail conclusions. It preserves intellectual openness, ensuring the mind remains receptive to newly emergent evidence and divergent cultural perspectives.

In practice, tolerating ambiguity yields four distinct structural advantages that elevate the quality of human judgment. First, it mitigates cognitive bias by acting as an internal brake, halting immediate leaps toward convenient but deeply distorted interpretations. Second, it galvanizes systemic inquiry, creating the necessary temporal space to search for deeper, verified proofs rather than surface-level satisfaction. Third, it optimizes strategic decision-making by forcing the thinker to meticulously compute likelihoods and weigh systemic risks before executing final steps. Lastly, it facilitates adaptive updating, fostering a resilient intellectual posture that readily modifies its worldview when confronted with superior data. Through these mechanisms, ambiguity transforms from an obstacle into a powerful resource for rational action.

2.1.4 Critical Thinking Skills

Critical thinking is not merely a set of cognitive tools, but an intellectual awakening that shifts the mind from passive consumption to active stewardship of truth. Within the framework of Competency-Based Education (CBE), these faculties serve as the catalyst for transforming the learner from a dormant vessel of memorized facts into a dynamic arbiter of reality. Grounded in foundational educational theory, these cognitive processes underlie the very execution of complex intellectual tasks (Bailin et al., 1999; Facione, 1998; Siegel, 1985). To think critically, as championed by scholars who view it as the ultimate realization of human reason is to engage in an ongoing dialogue with existence, moving past the superficial layer of information to dismantle illusions, evaluate evidence, and construct meaning (Siegel, 1985). By transitioning from a passive listener to an active problem-solver and decisive decision-maker, the individual reclaims their intellectual autonomy.

This cognitive evolution relies on a triad of foundational skills: observation, which demands a disciplined, hyper-aware gathering of environmental data; analysis, which deconstructs complex realities into their constituent parts; and interpretation, the vital art

of decoding the hidden meanings and contexts behind what is observed (Facione, 1998).

Once raw reality is perceived and deconstructed, the higher faculties of reason translate these insights into deliberate, impactful action. The mind initiates an intellectual leap through inference, drawing logical conclusions by navigating the space between the known and the unknown, while evaluation acts as a crucible to weigh the validity, bias, and strength of competing claims (Facione, 1998). This internal clarity finds its voice through explanation and effective communication, a skill that transforms solitary insight into shared, coherent understanding (Facione, 1998). Bound together by the rigorous architectural framework of reasoning - where the thinker recognizes the compelling force and epistemic quality of logic, these distinct cognitive elements ultimately converge into problem-solving (Siegel, 1985). Through this final act, critical thinking transcends abstract philosophy, weaponizing intellect to resolve the tangible conflicts, ambiguities, and vulnerabilities of the human condition. Rather than viewing these elements as isolated mechanics, contemporary curricular theory notes that these skills form a holistic suite of intellectual resources that empower learners to actively navigate the modern world (Bailin et al., 1999). Some explanations on the above skills:

i. Observation

Observation is the primordial lens of the critical intellect, serving as the foundational sensory threshold where inquiry begins. The observant mind does not merely perceive; it registers subtle shifts in the conceptual environment, instinctively sensing and identifying the emergence of an underlying problem. Beyond mere recognition, profound observation penetrates the surface to comprehend *why* a phenomenon fractures into a problem, contextualizing anomalies within a broader framework of cause and effect. Grounded in a rich tapestry of past experiences, this heightened attunement allows a thinker to anticipate structural friction and predict disruptions before they materialize. Ultimately, observation transforms the passive act of seeing into an active,

predictive diagnostic tool that prepares the mind for deeper investigation.

ii. Analysis

Once a disruption is observed, analytical intellect becomes the primary instrument of dissection, separating essential truths from superficial clamor. To analyze a situation effectively is to exercise epistemic discernment - knowing precisely which facts, data, or fragments of information carry structural weight and which are merely peripheral. This rigorous process demands the systematic collection of unbiased information, free from the distorting influence of cognitive preconceptions. By interrogating data with targeted, incisive questioning, the analytical mind verifies the accuracy of its inputs, assessing every finding through a lens of absolute objectivity. Through this deliberate deconstruction, raw data is distilled into verified, actionable insight.

iii. Inference

Inference represents the cognitive leap from the known to the unknown, synthesizing disparate clues to illuminate what remains hidden. It is the art of drawing nuanced conclusions from incomplete architecture, a skill that bridges the gap between limited data and conceptual clarity. This interpretive act often relies on a reservoir of domain-specific expertise; a mechanic diagnosing a sporadic engine failure, for instance, must decode invisible systemic flaws from purely circumstantial symptoms. To mature this capability, one must cultivate the discipline of the educated hypothesis over the convenience of the premature conclusion. By slowing the rush to judgment, the mind learns to meticulously audit subtle anomalies, patterns, and reports, extracting profound meaning from a sparse landscape of evidence.

iv. Communication

Communication is the dialogical matrix through which individual thought is translated into collective reason. Within the architecture of Competency-Based Education (CBE), communication is not

merely the transmission of data, but a vital testing ground forged through the friction of intellectual disagreement. By engaging with conflicting perspectives, learners are compelled to abandon rigid solipsism and articulate complex ideas with calm, rational precision. This pedagogical framework elevates active listening and mutual respect from simple social etiquettes to essential tools of critical evaluation. When individuals learn to navigate the turbulence of difficult discussions with intellectual humility, they transform subjective opinions into collaborative, thoroughly audited solutions.

v. Problem-Solving

Problem-solving is the teleological culmination of the critical mind, the ultimate arena where abstract analysis is actualized into tangible reality. The entire trajectory of identification, dissection, and inference exists to serve this final, decisive execution of a solution. Within CBE, the cultivation of this skill relies on the pursuit of embodied, hands-on knowledge, ensuring that theoretical understanding is permanently anchored to practical competence. Eventually, this mastery manifests as an instinctual fluency within one's professional domain, allowing the thinker to execute tasks with precision while critically monitoring whether the reality matches the goal. By observing the methodologies of peers and interrogating their processes, the problem-solver turns the world into a continuous classroom of adaptive innovation.

In synthesis, these five dimensional skills do not operate as isolated mechanics, but rather as a unified, self-reinforcing cognitive ecosystem. The journey of the critical intellect begins with Observation, the sensory gateway that detects the initial friction within an environment. This raw awareness is immediately ordered by Analysis, which dissects the phenomenon to separate objective reality from superficial blare. From this clarified landscape, Inference ventures into the unknown, forging educated leaps to bridge the gaps in incomplete data. These internal insights are then brought to light through Communication, where they are tested, refined, and democratized in the crucible of shared discourse.

Finally, this entire intellectual trajectory finds its fulfillment in Problem-solving - the decisive arena where abstract theory is translated into deliberate, real-world action. Together, these competencies transform the passive learner into an active architect of innovation, capable of navigating complexity with both analytical rigor and practical wisdom.

2.2 Critical Thinking Traits

We have explained how important critical thinking skills are for today's learners (and for *everyone*) to build on. Every educator needs to know how crucial it is to cultivate these skills in classrooms and indeed throughout learners' whole lives. But what does the ideal critical thinker look like? What are the most crucial defining traits of effective critical thinkers?

Effective critical thinkers' function by way of different thought processes in different circumstances. After all, figuring out how to make it to work on time when your car breaks down in rush hour traffic requires critical thinking application just as much as negotiating world peace does. Both scenarios facilitate such skills in far different settings, and with different stakes and outcomes, but they call upon these skills nonetheless.

The question is about what universal traits the effective critical thinkers in each circumstance, and all those in between, would share. That's the mystery we intend to solve here by offering suggestions of what the most important defining traits of a critical thinker would be, namely: curiosity, compassion, awareness, decisiveness, honesty, willingness, creativity, criticality, sensitivity to context, innovativeness, tolerance, perseverance, and, faith in reason. We explain each of these traits.

- *Curiosity*: effective critical thinkers are inherently curious about a wide range of topics and generally have broad interests. They tend to have a healthy inquisitiveness about the world and about people. An understanding of and appreciation for the diversity of cultures, beliefs, and views

that encompass humanity are one of the hallmarks of a great critical thinker. This is also part of what makes them lifelong learners.

- *Compassion:* as we seek to gift our readers and learners with these indispensable skills, we must not forget that they embrace the emotional and instinctual as much as the intellectual. Effective critical thinkers' act as much with their hearts as they do with their minds. The world is full of enough judgment and segregation, much of it from a lack of a clear understanding of one another's secret history of perseverance through often unimaginable suffering. Effective critical thinkers are inherently curious about a wide range of topics and generally have broad interests.

Each one of us has a story of our own that makes us who we are, as well as personal trials and challenges that have shaped us. Critical thinkers recognize this and compassionately celebrate the uniqueness in everyone, and are willing to help us see the best in ourselves and others.

- *Awareness:* opportunities to apply critical thinking skills are all around us every moment. Effective critical thinkers remain tuned into this and are always alert for chances to apply their best thinking habits to any situation. A desire to think critically about even the simplest of issues and tasks indicates a desire for constructive outcomes.

Effective critical thinkers don't take anything at face value, either. They never stop asking questions and enjoy exploring all sides of an issue and the deeper facts hiding within all modes of data. As such, those who think critically also tend to be instinctual problem solvers. This ranks as probably the most important skill we can help our learners build upon.

- *Decisiveness:* many situations that call for critical thinking also call for quick and decisive action. When we think critically, we weigh our options and imagine the outcomes in the moment with speed and clarity and are able to put aside fear when it comes to making decisions. In essence,

critical thinkers like to move things forward rather than moving backward or procrastinating, because they thrive on progression.

In addition to this, often, choices have to be made even when we don't have all the information; we need to make them with confidence. When facing any kind of a challenge, often someone has to take the lead and make the hard decisions others shy away from. Effective critical thinkers realize that, more often than not, it's necessary to take the initiative and make a decision even if it ends up being the wrong one. To them, that's preferable to not making any decision at all.

- *Honesty:* Honesty is important in any sense, but it is especially important to critical thinking. Moral integrity, ethical consideration and action, and global citizenship practices are all hallmarks of effective critical thinkers. It's not a surprise that honesty resides at the core of all things. We see in critical thinkers a strong desire for harmony and fulfilment in the world, and part of attaining this by learners involves pursuing honesty in all their educational endeavors, and future careers.

Many situations that call for critical thinking also call for quick and decisive action. The practice of honesty in critical thinking also extends to how one looks within oneself to embrace what resides there. It takes into account the processes behind managing our emotions, controlling our impulses, and recognizing any attempts at self-deception. Critical thinkers are as equally aware and accepting of themselves as they are of others.

- *Willingness:* willingness and flexibility encompass a number of key considerations for the critical thinker. They include but aren't limited to the ability to: i) learn from their own personal mistakes and shortcomings; ii) challenge the status-quo when the need arises; iii) open-mindedly embrace other opinions and views that challenge their own; iv) reconsider and revise their opinions in the wake of new

evidence; v) listen actively rather than simply wait for their turn to talk; and, vi) constantly improve, learn, and excel.

- *Creativity*: effective critical thinkers are also largely creative thinkers. Creativity has unquestionably defined itself as a requisite skill for having in the collaborative modern workforce. Critical thinking in education, business, marketing, and professional alliances relies heavily on one's ability to be creative. When teachers get creative in their pedagogical methods, the learners' curiosity is reactivated and the thread of comprehension and application is kindled.

In addition to the above, there are salient features of critical thinking, which includes objectivity, rationality, creativity, open-mindedness, reflectiveness, modesty, observation, and, the desire to learn more. All these are foundational components that aim at enhancing the effectiveness of the CBE system.

2.3 Value and Importance of Critical thinking

The overall value and importance of critical thinking to CBE cannot be over-emphasized.

- Critical thinking and problem solving inculcate habits of thought - the ability to think without the box and use reason as the engine to existence.
- Encourages breadth of vision - the ability to see things from different points of view
- It gives us a sense of self-perspective in our activities, and our lives - the ability to examine alternatives and choose those relevant to ensure we live an examined and worthy life.
- Its concerns are very abstract but with immense practical value - the ability to translate ideas (theory) into practice through action.
- Its interest and value lie in its ability in helping us to understand ourselves and our world better and more deeply than we otherwise would, and in permanently altering our

approach to our lives and our relations to others through encouraging a lifelong habit of reflection on them.

- Critical thinking and problem solving immensely enrich one's life, and can open to one view that would otherwise be closed or overlooked.
- It greatly enhances one's analytical, critical, evaluative, and interpretive abilities,
- It enhances one's ability to express oneself clearly and to formulate and respond to arguments in speech and writing effectively.
- Critical thinking and problem solving provides one with general problem-solving skills, skills in analyzing concepts, definitions, arguments, and problems.
- It enables one to organize ideas and issues and to extract what is central to an issue from a mass of information.
- It enhances one's ability to question deeply one's own framework of thought
- It equips an individual with the ability to reconstruct sympathetically and imaginatively the strongest versions of points of view and frameworks of thought opposed to one's own
- It inculcates the ability to reason dialectically (multi-logically) in such a way as to determine when one's own point of view is at its weakest and when an opposing point of view is at its strongest
- It helps both to make fine distinctions and to find what common ground between opposing positions is.
- Critical thinking and problem solving encourages one to synthesize or bring together a range of different views into one more comprehensive and coherent position.
- Critical thinking and problem solving improves one's communication skills, through improving one's ability to present ideas in well-constructed, systematic arguments, to

express what is unique about one's views, and to explain difficult material.

- By presenting well-thought-out arguments, clear formulations, and apt examples, in turn, critical thinking lends one's arguments persuasive power.
- The give and take of critical thinking and problem-solving based discussions improves one's ability to think on one's feet, and to indicate why one's own views are to be preferred to others.
- Critical thinking and problem-solving aids one in recognizing when and in what respect one's own views may be incorrect, and what must be revised or discarded and what can be retained.
- Critical thinking and problem-solving lays emphasis on clarity and rigor of argument, the apt use of example and illustration, and sensitivity to the strengths and weaknesses both of views one is examining and of one's own view thus making ideas that determine good reasoning, and living more explicit and relevant.
- Critical thinking and problem solving plays an important role in social change - institutions in any society (courts, governments, schools, businesses etc.) - are products of a certain way of thinking.
- Critical thinking and problem-solving helps in uncovering biases and prejudices.
- Critical thinking and problem-solving is a path to freedom from half-truths and deceptions as it opens up one's mind to seeing things independent of emotions, native biases, and from different perspectives.
- The willingness to change one point of view as we continue to examine and re-examine ideas that may seem obvious is a major component of critical thinking and problem-solving. Such thinking takes time and the willingness to say

three subversive words: "*I don't know.*" means the desire to learn, rather than to perpetually express ignorance.

2.4 Essential Characteristics of Critical thinkers

Critical thinkers occupy a rare and solitary space in the landscape of human consciousness, embodying an intellectual posture that transcends the conventional boundaries of everyday thought. To think critically is not merely to possess a mechanical skill; it is to commit to a rigorous mode of being. It is an awakening to the idea that the mind must not passively absorb the world, but actively interrogate it. By elevating reason as the supreme beacon of human existence, the critical thinker transforms the act of cognition from a default biological function into a deliberate, philosophical pursuit of truth.

At the core of this intellectual commitment is an unwavering devotion to rationality over the volatile currents of emotion. While the unreflective mind is often tossed about by the passions, the critical thinker seeks the steady, tranquil anchor of sequential logic. This is not a denial of human feeling, but a refusal to let prejudice dictate reality. To look at a problem without appealing to base emotions requires a profound level of self-mastery, ensuring that judgment is built entirely upon verifiable evidence and sound premises rather than comfort or convenience.

This pursuit demands a unique form of endurance - an intellectual patience capable of tolerating profound ambiguity. Where the crowd demands instant certainties and comfortable illusions, the critical thinker is willing to dwell within the unknown, allowing ideas the necessary time to ripen through deep reflection. It takes immense fortitude to resist the urge for hasty conclusions. This patience is paired with an insatiable eagerness to express well-reasoned thoughts, not for the sake of rhetorical vanity, but to actively participate in the shared human dialectic.

Perhaps the most defining characteristic of this mindset is a radical open-mindedness that welcomes alternative perspectives. The

critical thinker possesses the rare intellectual courage to pursue an inquiry wherever it may lead, even if it disrupts long-held personal dogmas. They treat opposing arguments not as threats to be conquered, but as mirrors to test the validity of their own assumptions. When confronted with discordant evidence, they do not retreat into defensive denial; instead, they willingly reevaluate their worldview, demonstrating that their ultimate loyalty belongs to the truth rather than the ego.

Consequently, this path requires a humbling standard of intellectual honesty. The critical thinker is hyper-aware of human fallibility and actively trains the mind to detect errors in persuasion, cognitive biases, and deceptive, fallacious arguments. When they themselves stumble into error, they do not obscure their mistakes behind a facade of false authority. They accept their errors, correct them, and offer sincere apologies. This capacity for self-correction transforms mistakes from failures into vital milestones of learning and growth.

This ongoing interrogation of reality is driven by the art of the penetrating question. By asking thought-provoking questions, the critical thinker cuts through superficial rhetoric to reveal the underlying architecture of any given argument. They maintain an intimate connection with their personal thoughts, ensuring an internal alignment between what they believe and why they believe it. They recognize that an unexamined life is a life led by proxy, and thus they remain vigilantly in touch with their own cognitive processes.

Ultimately, the critical thinker perceives the universe not as a collection of isolated fragments, but as an interconnected web of knowledge. They possess the unique ability to bridge disciplines, using insights from philosophy, science, and literature to enrich their reading and broaden their learning experiences. By synthesizing disparate fields, they transcend narrow specialization to achieve a holistic view of existence. In a world often fractured by dogma and superficiality, the critical thinker remains a vital guardian of nuance, navigating the complexities of human life with clarity, resilience, and profound depth.

SECTION THREE

Critical Thinking - The Foundational Pillar to CBE

3.0 Introduction

The adoption of the Competency-Based Curriculum (CBC) in Kenya represents a paradigm shift in the country's educational architecture, transitioning from the exam-heavy 8-4-4 system to a learner-centred framework. According to the Kenya Institute of Curriculum Development (KICD) (2017), the old system heavily incentivized rote memorization and academic competition. In contrast, the CBC prioritizes the practical application of knowledge, skills, and values. Akala (2021) and Amunga et al. (2020) observes that this reform aims to foster holistic student development, ensuring that Kenyan school graduates are globally competitive and capable of driving national growth.

In order to fulfill this vision, the Basic Education Curriculum Framework (BECF) outlines seven core competencies required for every learner. These competencies are: communication and collaboration, self-efficacy, critical thinking and problem-solving, creativity and imagination, citizenship, digital literacy, and learning to learn. Although not explicitly affirmed, *critical thinking and problem-solving* stands out to serve as the vital cognitive anchor. In the words of Momanyi and Rop (2020), facts and educational content evolve rapidly. Therefore, the primary objective of modern instruction must be equipping learners with the capacity to analyze situations and adapt to future environments.

In this regard, critical thinking functions as the engine for the realization of all other CBC competencies. For instance, the competency of *digital literacy* extends beyond operating devices; it demands the analytical capacity to evaluate information validity and

detect online scams, a need emphasized in studies by Sifuna and Obonyo (2019). Similarly, *communication and collaboration* are elevated from simple interactions to deep collective problem-solving when students apply reasoning to negotiate conflicts and synthesize group ideas. Without critical thinking, tasks associated with other competencies risk becoming mechanical checklists rather than meaningful life skills.

It's self-evident that the successful execution of Kenya's CBC rests on the deliberate and strategic integration of critical thinking across all academic subjects and pathways. When educators actively nurture these higher-order analytical skills, they move learners away from passivity toward full ownership of the learning process. Sustained investment in teacher training and resource distribution remains crucial to overcoming operational hurdles. Resolving these issues will allow critical thinking to successfully transform static academic requirements into the dynamic capabilities required for 21st-century citizens. Let us look at the competences and how they play out at the university-level education.

3.1 CBC Competences

1. Communication and Collaboration in Professional Environments

At the university level, this competency transitions from basic teamwork to managing professional dynamics, interdisciplinary research, and stakeholder engagement. Higher education requires students to articulate complex theories, defend research papers, and collaborate with diverse peers across cultural and academic backgrounds. This prepares graduates for global corporate environments and collaborative research industries.

- **University Scenario:** In an *Engineering and Business dual-project*, senior undergraduate students form cross-functional teams to design a commercially viable medical device. The engineering students must

translate complex technical jargon into layman's terms for the business students, who in turn must pitch the financial viability of the prototype to industry investors using corporate communication strategies.

2. Critical Thinking and Problem Solving through Research

University-level critical thinking demands that students move past regurgitating academic papers to actively interrogating existing literature, identifying research gaps, and solving complex societal challenges. It involves evaluating conflicting evidence, data analytics, and applying theoretical frameworks to unpredictable, real-world data sets.

- **University Scenario:** In a *Data Science or Public Health seminar*, students are given raw, unorganized regional health data during an infectious disease outbreak. Instead of following a structured lab manual, they must independently write code to clean the data, identify anomalies, evaluate the socio-economic factors driving the numbers, and formulate a policy recommendation paper for the Ministry of Health.

3. Creativity, Innovation, and Entrepreneurship

In higher education, creativity is scaled into innovation and entrepreneurship. It encourages students to patent new technologies, develop novel artistic expressions, or design innovative software. The focus shifts to creating intellectual property and practical solutions that can disrupt markets or uplift communities.

- **University Scenario:** In an *Agricultural Science program*, students are tasked with addressing post-harvest losses for smallholder farmers. Rather than writing a traditional essay, a student designs a low-cost, solar-powered charcoal cooler using locally

sourced materials. They then pitch this prototype at the university's incubation hub to secure seed funding for a campus startup.

4. Advanced Digital Literacy and Tech Integration

University digital literacy is not just about using software, but mastering specialized tools like programming languages, statistical packages (SPSS, R), computer-aided design (CAD), or artificial intelligence tools. It also heavily emphasizes digital ethics, intellectual property rights, data privacy, and combatting academic plagiarism in a tech-driven research landscape.

- **University Scenario:** In *an Architecture and Urban Planning studio*, students do not just draw blueprints; they use advanced Building Information Modeling (BIM) software to simulate how a proposed skyscraper will withstand environmental stressors like earthquakes or high winds, utilizing cloud-based collaboration tools to edit the model simultaneously with international exchange peers.

5. Global Citizenship and Professional Ethics

University education prepares students to be leaders who navigate complex ethical landscapes, human rights issues, and sustainability goals (such as the UN SDGs). It instills a deep sense of professional accountability, ensuring that future doctors, lawyers, and politicians act with integrity and respect for diverse global populations.

- **University Scenario:** In *a Faculty of Law clinic*, law students provide pro-bono legal aid to marginalized communities facing unlawful evictions. Through this, they do not just memorize statutes; they actively engage with human rights frameworks, navigate the complexities of local land laws, and experience the ethical weight of defending vulnerable populations.

6. Lifelong Learning and Autonomous Research (Self-Efficacy)

Higher education is the ultimate testing ground for self-efficacy, as students move away from guided high school schedules to completely unstructured independent study. Developing this competency ensures that graduates can up-skill themselves long after they graduate, adapting to job markets where technologies change rapidly and old degrees quickly become obsolete.

- **University Scenario:** A *Postgraduate or Final Year Undergraduate student* undertaking an independent dissertation must define their own research questions, design their methodology, obtain ethical clearance, and manage their time across a 12-month period. When their initial experiments fail, their self-efficacy drives them to troubleshoot the issues independently rather than abandoning the project, transforming them into autonomous scholars.

3.2 Effect of CBE on University Curriculum

When universities transition to a Competency-Based Curriculum (CBC), their curriculum blueprints must undergo a structural rewrite. Traditional blueprints focus on *inputs* (what content the lecturer covers and how many hours students sit in a lecture hall). CBC blueprints focus on *outputs* (what demonstrable tasks a student can perform at the end of the program).

Here is how curriculum blueprints change across six key structural dimensions, including a visual mapping of the shift.

1. Structural Comparison: Traditional vs. CBC Blueprint



TRADITIONAL BLUEPRINT (*Content-Driven*)

[Course Title] → [List of Textbook] → [2-Hour Sit-In Exam] → [Grade/Credit]

CBC BLUEPRINT (*Outcome-Driven*)

[Industry Needs] → [Core Competency] →

[Performance Indicators] → [Authentic Assessment]

2. Six Structural Changes in the Curriculum Blueprint

a) From "Course Topics" to "Competency Domains"

Traditional blueprints list chapters or theoretical concepts to be taught. CBC blueprints map out specific professional capabilities.

 **The Shift:** A traditional Bachelor of Computer Science blueprint lists a module called "*CSC 301: Advanced Database Systems.*" A CBC blueprint renames or restructures this module around a competency domain: "*Domain: Enterprise Data Architecture and Cloud Security.*"

b) From "Contact Hours" to "Milestone Mastery"

Instead of measuring progress by credit hours (e.g., "45 hours of lecture attendance"), the blueprint dictates the milestones or performance tasks a student must successfully demonstrate to pass, regardless of how fast or slow they learn.

 **The Shift:** Rather than requiring 4 weeks of sitting in a lecture on epidemiology, a Medical blueprint requires the student to independently trace and document a mock disease outbreak in a community to unlock the next phase of the course.

c) Integration of Multi-Disciplinary Blocks

Traditional blueprints isolate subjects into strict departmental silos. CBC blueprints organize learning into thematic or problem-based blocks that force different fields to intersect.

 **The Shift:** Instead of separating *Economics*, *Statistics*, and *Public Policy* into three different exam papers, a CBC Public

Administration blueprint merges them into a single 12-week block called "*Urban Housing and Resource Allocation Simulation*."

d) The Assessment Strategy Blueprint

Traditional blueprints rely heavily on a mid-semester test (CAT) and a final 70% written exam. A CBC blueprint explicitly outlines continuous, authentic assessments that mimic real professional tasks.

 **The Shift:** Written essays and multiple-choice finals are replaced in the blueprint by portfolios, capstone projects, peer-reviewed lab mock-ups, and oral defenses of practical work.

e) Co-Design with Industry Stakeholders

Traditional blueprints are often written solely by academic professors. CBC blueprints require documented input from industry experts, professional regulatory bodies (e.g., engineering boards, medical councils), and alumni to ensure the competencies match current job market demands.

 **The Shift:** Before a university Senate approves a new CBC Hospitality degree blueprint, it must show sign-offs and alignment with standards set by leading hoteliers, tourism boards, and culinary agencies.

f) Explicit Mapping of Core Employability Skills

In traditional curricula, soft skills like teamwork or digital ethics are "invisible" or assumed to be picked up along the way. In a CBC blueprint, these are explicitly mapped, taught, and graded alongside technical skills.

 **The Shift:** A Journalism blueprint will feature an explicit rubric matrix showing exactly which week and through which assignment a student's *Digital Literacy* (fact-checking tools) and *Global Citizenship* (ethical reporting on vulnerable groups) will be evaluated.

Example: A CBC Blueprint Unit Matrix

This is how a single unit looks inside a university-level CBC blueprint document:

Industry-Identified Competency	Performance Indicators (What the student must show)	Learning Experience /Delivery Mode	Authentic Assessment Task
Sustainable Infrastructure Design (Civil Engineering)	1. Analyzes environmental impact reports. 2. Selects eco-friendly building materials. 3. Optimizes structural integrity using CAD	• Problem-based studio work. • Site visits to green buildings. • Independent software labs.	Student must design and pitch a blueprint for a net-zero carbon community clinic to a panel of practicing architects.

3.3 Critical Thinking: The Cognitive Architecture of CBE

Earlier, we state the cardinal role played by critical thinking and problem solving in the entire paradigm of CBE. We can now authoritatively assert that critical thinking serves as the foundational pillar of Competency-Based Education (CBE), acting as the bedrock upon which all other educational outcomes are constructed. In a modern academic landscape, knowledge is no longer a static commodity to be memorized, but a dynamic resource to be manipulated, questioned, and applied. Without this primary pillar, the curriculum risks becoming a superficial checklist of mechanical tasks rather than an ecosystem of deep, adaptive learning. By prioritizing the ability to analyze structures and dismantle complex dilemmas from day one, CBE ensures that students possess the underlying cognitive strength necessary to

support and sustain every other professional capability they develop.

Critical thinking and problem solving fundamentally functions as the cognitive engine of Competency-Based Education (CBE). While other competencies focus on specific domains of knowledge or execution, critical thinking provides the intellectual scaffolding required to process, analyze, and apply information effectively. Without the ability to interrogate assumptions and evaluate evidence, a student cannot genuinely master any other skill. This makes critical thinking the foundational bedrock upon which the entire CBE framework is constructed.

In the realm of *Communication and Collaboration*, critical thinking shifts interactions from superficial compliance to meaningful discourse. Effective communication requires more than vocabulary; it demands that a speaker analyze their audience, anticipate counterarguments, and structure logically sound ideas. When working in teams, problem-solving skills allow students to deconstruct conflicts, assess diverse viewpoints objectively, and synthesize differing ideas into a cohesive strategy. This analytical processing transforms group work from a mere division of labor into a truly collaborative, intellectual partnership.

When applied to *Creativity and Imagination*, critical thinking acts as the vital bridge between a novel idea and a functional innovation. Raw imagination can generate wild, unconstrained concepts, but critical thinking evaluates those concepts for feasibility, relevance, and impact. A student must identify a specific friction point or systemic failure - a problem-solving task, before they can create a targeted, original solution. Therefore, meaningful innovation in CBE is never random; it is the deliberate result of creative thinking disciplined by rigorous analytical critique.

In an era dominated by rapid technological evolution, *Digital Literacy* becomes obsolete without a strong foundation of critical evaluation. True digital literacy is not merely knowing how to navigate software or write code; it is the capacity to verify

information, detect algorithm bias, and evaluate data privacy risks. When students use digital tools to solve complex academic or professional puzzles, they must critically filter out misinformation and synthesize fragmented online data. Problem-solving skills ensure that technology remains an active tool for inquiry rather than a passive source of distraction.

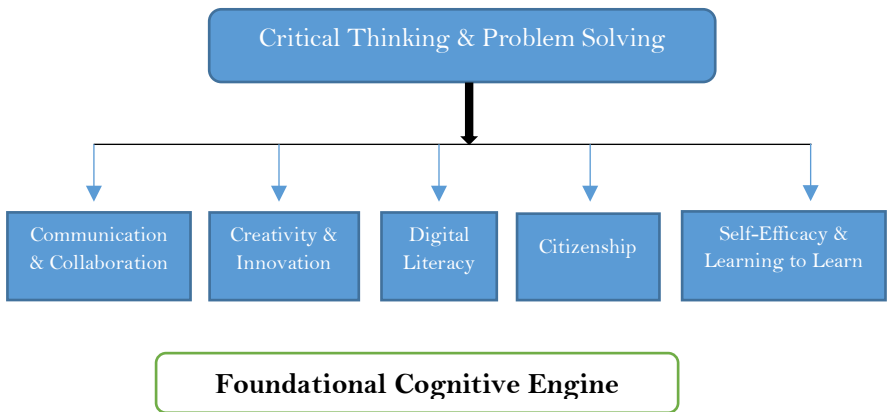
The realization of *Citizenship* and professional ethics is equally dependent on a learner's ability to navigate moral complexities. Civic responsibility requires individuals to look beyond personal biases, analyze structural inequalities, and evaluate the long-term societal consequences of policies or laws. When faced with ethical dilemmas in their communities or industries, students must use problem-solving frameworks to balance competing interests and advocate for justice. Critical thinking elevates citizenship from blind patriotism or passive law-abiding into active, ethical, and transformative community leadership.

Within the domain of *Self-Efficacy and Learning to Learn*, critical thinking provides the tools for honest self-reflection and metacognition. For a student to independently manage their educational journey, they must be able to diagnose their own learning gaps and analyze why a particular study method or experiment failed. Problem solving turns personal setbacks into analytical puzzles rather than emotional defeats. By systematically troubleshooting their own academic weaknesses, students build a resilient belief in their capabilities, transforming them into self-directed, lifelong learners.

Beyond its application to individual pillars, critical thinking serves as the unifying element that prevents CBE from fracturing into isolated, mechanical sub-skills. In a professional or academic ecosystem, a student rarely uses just one competency in isolation. A project will simultaneously demand digital research, team collaboration, and ethical design. Critical thinking is the overarching executive function that allows a student to dynamically switch between, integrate, and orchestrate these various competencies to resolve multi-layered, real-world challenges.

Ultimately, critical thinking and problem solving ground the entire CBE philosophy by shifting higher education away from passive consumption toward active knowledge creation. It transforms the curriculum blueprint from a checklist of discrete, performative tasks into an integrated ecosystem of cognitive mastery. By training students to question premises, analyze systems, and engineer solutions, universities ensure that graduates do not just hold a degree certifying what they *know*, but possess a robust intellectual framework that dictates how they *operate* in an unpredictable world.

The Umbrella Architecture of CBE Competencies



Critical thinking and problem solving sit at the apex of the Competency-Based Education architecture. The diagram above illustrates how this single cognitive engine continuously feeds into, refines, and sustains the execution of the other five core competencies.

Here is a breakdown of the specific analytical mechanics flowing through each branch:

- ➔ **Communication and Collaboration:** Critical thinking filters raw thoughts into structured arguments while problem-solving skills allow students to resolve team friction, evaluate group dynamics, and synthesize conflicting peer viewpoints.

- ➔ **Creativity and Imagination:** Imagination generates ideas, but critical thinking evaluates them for real-world viability, resource constraints, and scalability, turning abstract concepts into functional innovations.
- ➔ **Digital Literacy:** Analytical thinking acts as a shield against digital misinformation, allowing students to critically audit data sources, detect algorithmic biases, and solve complex problems using advanced technological tools.
- ➔ **Citizenship:** Problem solving enables students to dismantle systemic societal challenges and navigate deep ethical dilemmas, elevating citizenship from passive rule-following to active community leadership.
- ➔ **Self-Efficacy and Learning to Learn:** Metacognition—thinking about how one thinks—allows students to objectively analyze their own academic weaknesses, troubleshoot failed study habits, and independently direct their learning journeys.

Critical thinking is the quiet soul of competency-based education because true competence requires conscious reflection. When learners question assumptions, they stop merely absorbing knowledge and begin shaping it. This inner discipline turns rigid tasks into living wisdom. Education then becomes an art of true understanding rather than a factory for memorized answers. Without this questioning mind, skills are empty tools. With it, every learned ability becomes a path to human freedom.

SECTION FOUR

Essentials of Education in the Critical Faculty

4.0 Introduction

Education in the critical faculty aims at moving learners past passive memorization into active, independent thought. The core essentials focus on transforming students from passive information consumers into judicious, analytical creators. Many seasoned writers have underscored the importance of education not only for human understanding but also in the entire paradigm of skills development. Bertrand Russell for example developed a rich conception of education, involving a complex set of skills, dispositions and attitudes, which together delineate a virtue that has both intellectual and moral aspects. His views on Critical thinking and education for thinking and self-reflection are of enormous importance in our understanding of the nature of CBE educational aims.

CBE aims at inculcating skills, dispositions, and attitudes requisite for critical thinking, self-reflection, rational judgments and cognitive maturation. This section discusses the importance of education, skills, attitudes and dispositions of education in the critical faculty.

4.1 Definition of Education

Education is the deliberate awakening of human potential, a lifelong alchemy that transforms raw curiosity into disciplined wisdom and self-governance. Rather than a mere mechanism for information transfer, it is an existential journey - the process through which an individual learns to navigate the tension between the known universe and the mysteries of the unexamined self. By engaging

with history, science, and the arts, the learner inherits a shared human conversation, cultivating the critical empathy and intellectual courage required to question prevailing dogmas and articulate new truths. Ultimately, education serves as both a mirror and a horizon, reflecting who we are while revealing who we might become, expanding the boundaries of human agency to construct meaning in an indifferent world.

Within this framework, the integration of critical thinking with Competency-Based Education (CBE) serves as the vital mechanism that bridges theory and practice. The ultimate objective of nurturing critical inquiry within a competency-focused model is not just the mastery of isolated tasks, but the cultivation of an educated individual who can skillfully address the volatile, uncertain challenges of the contemporary world. By transforming abstract knowledge into adaptable, reflective action, this approach empowers learners to become active problem-solvers who don't just survive the modern landscape, but actively work to make the world a better, more equitable, and more humane place for everyone to coexist.

To embody the true fruit of this holistic process is to be educated, which means possessing an active, self-governing mind that has awakened to its own potential and its responsibility to the world. An educated person does not merely hold information; they use knowledge as a compass, demonstrating the intellectual humility to question their own assumptions and the refined sensibility to discern truth from noise. Conversely, to be schooled is to be socialized into conformity, prioritizing the passive absorption of prescribed curricula and the mastery of institutional mechanics over genuine existential growth. While schooling provides necessary tools like specialized credentials and economic skills, it emphasizes compliance and external validation, meaning a person can be highly schooled without ever becoming truly educated - mistaking the rigid boundaries of a syllabus for the boundless horizon of human understanding

4.2 Role of Education in the Critical Faculty

Education develops individual knowledge, skills, values, and attitudes. It enables personal growth, drives economic progress, reduces poverty, and promotes social cohesion and peace worldwide as a fundamental human right. In so doing, education liberate individuals from ignorance and dogmatic tendencies to rationality and self-understanding; it transform individuals from a state of individualism and mass-thinking to autonomy and individuality; it integrate individuals with the self, nature, and society; is a catalyst to progress and positive change for both the individual and society; is a spur to the development and reengineering of human society and individual growth; is a means to self-actualization, self-discovery, and reinvention; and, is a lever for human emancipation from the fetters of self-misdefinition, self-misconception, and self-deception.

Education in the critical faculty means training the mind to question, analyze, and evaluate beliefs, authority, and social structures instead of passively accepting facts at face value. This kind of education builds active thinkers who can reason logically, recognize bias, and make independent, ethical judgments. It helps to build, cement and solidify learners' skills for effective communication and collaboration, critical thinking and problem-solving, creativity and imagination, citizenship, digital literacy, learning to learn, and, self-efficacy, all of which are grounded in sharpening the critical faculty through infusion of critical thinking and problem solving competence across all learning disciplines' domains.

In addition, education in the critical faculty provides the ability to think with grounded reasons, pursue realistic dreams and aspirations in life and live a defined, deliberate and respectable life. It gives a definite path to follow, choices from which to decide, and leads to self-discipline by equipping the learner with requisite skills for freedom of expression, visibility, participation and respect. It frees the mind from prejudices, biases, perpetual dogmatic slumber, and egocentric tendencies; while motivating thinking logically,

sequentially, and precisely towards the attainment of desirable outcomes. It is essential for the overall development of the human mind and cognitive propensity. The benefits of such education are numerous, and below are just but a few.

- a) *Overcoming social prejudices:* This is probably the most important benefit of education in the critical faculty. Social evils and beliefs can really hold back the growth and development of society, and a country. To overcome this and understand and explain things with logic and reasoning, education in the critical faculty is essential. One enlightened mind can lit up a thousand more. Education, used in the proper way helps to reduce crime, restore law and order, and build a cohesive, peaceful and united society.
- b) *Nurture talent and pursue dreams:* Every human has dreams and aspirations. Education is a link and medium to pursue and fulfill them. It increases the knowledge of a person in different fields of study. It helps to determine a path to follow and visibly express one's talent to the world.
- c) *Enhance creativity and imagination:* Education opens up new ways and ideas to reflect upon. It cultivates a young mind to think without the box and explore different things in life. Education also helps to know about things and stay healthy, fit and follow a productive lifestyle.
- d) *Contribute to a bigger growth:* Education is a way of academic and intellectual excellence. It paves the path for the economic growth of a nation. Research and development in sectors like technology, medicine, sports, and others, breakthrough innovation, and progressive mindset - all of which are fruits of education. It takes a nation and its people forward. Educated people contribute towards advancement in every sector of development and human advancement.
- e) *Promotes citizenship and national pride:* the cultivation of rational, judicious, and analytical thinking empowers learners to question assumptions, evaluate evidence, and make reasoned judgments. In a Competency-Based

Education (CBE) framework, this intellectual training directly builds the core competency of citizenship by transforming passive societal occupants into active, ethically responsible, and critically literate participants

- f) *Knowledge, wisdom, and exposure*: Education opens up every channel of knowledge and wisdom. It exposes us to a new world of information, invent new things, and guides us on how we can make our surroundings a better place to live and put our lives to greater, and better use.
- g) *Enhance communication and collaboration*: Education in the critical faculty builds skills to analyze information, spot weak arguments, and think clearly. These skills improve communication and collaboration by helping people share ideas accurately, listen with an open mind, and solve team problems without personal bias. It is a catalyst to clear messages, better listening and stronger evidence; resulting in the ability to fairly address conflicts, have a structured mindset, and becoming a smart problem-solver.
- h) *Strengthens self-efficacy*: It teaches learners to analyze evidence, question assumptions, and solve complex problems independently. When learners master these analytical tools, they gain confidence in their own judgment and agency. This mastery directly strengthens their belief in their capacity to succeed.

In the words of Nelson Mandela, “*Education is the most powerful weapon, which one can use to change the world.*” When the world is busy getting equipped with deadly weapons and machinery, terrorism has been institutionalized, respect for human rights and dignity is abused, it is very important to understand that education is the real and only asset that can develop an individual, reclaim the sanctity of decency, and protect vulnerable nation. The need for nations and world leaders to join hands and make education, not only a fundamental right for all but also the guiding light, which can take humankind ahead through all phases of global darkness has never been urgent and wanting as it is today.

4.3 Skills, Dispositions, and Attitudes for Education in the Critical Faculty

Education in the critical faculty demands a rich tapestry of skills, dispositions, and attitudes that collectively forge an intellectual and moral virtue. This holistic character trait acts as a vital psychological and ethical shield, preventing the emergence of toxic cognitive vices like dogmatism, rigid prejudice, and mental laxity. By marrying rigorous intellect with moral responsibility, this transformative ethos serves as the deep philosophical cornerstone for modern Competency-Based Education (CBE). It shifts the purpose of schooling from the passive absorption of data to the active cultivation of human agency, suggesting that to think well is, fundamentally, to live well.

To fully understand this educational paradigm, we must first examine its foundational elements through a dual philosophical lens. On an epistemic level, this education develops intellectual virtues such as open-mindedness, a love for truth, and intellectual humility, pushing learners to interrogate assumptions and navigate complex realities with objective clarity. Simultaneously, it engages the moral realm, demanding the ethical courage to confront counter-evidence and a sense of justice when weighing competing viewpoints. True critical thought cannot exist in an ethical vacuum; it requires a deep-seated empathy that respects the dignity of diverse perspectives while fiercely resisting the lure of intellectual arrogance.

Ultimately, this synthesis of mind and character finds its practical expression within the Competency-Based framework, where abstract virtues are translated into lived actions. Education ceases to be a system of mechanical memorization and becomes a dynamic praxis - a training ground for the soul and the intellect. By embedding these critical dispositions directly into measurable competencies, the educational process transforms the student from a passive repository of knowledge into a rational, ethical agent. This holistic approach ensures that learners are not merely technically

proficient, but are deeply equipped for constructive civic engagement and wise navigation of an increasingly volatile world.

4.3.1 Skills of Education in the Critical Faculty

One central purpose of education is to prepare learners to be able to form "a reasonable judgement on controversial questions in regard to which they are likely to have to act". In addition to having access to impartial supplies of knowledge, CBE education aims to offer "training in judicial habits of thought. Beyond access to such knowledge, learners need to develop certain *skills* if the knowledge acquired is not to produce individuals who passively accept the teacher's wisdom or the creed which is dominant in their own society; let's talk of intelligence, contrasting it with information alone; to indicate the whole set of critical abilities such education is supposed to impact.

Such critical thinking skills grounded in knowledge include:

- i. *the ability to form an opinion for oneself*, which involves being able to recognize what is intended to mislead, being capable of listening to eloquence without being carried away, and becoming adept at asking and determining if there is any reason to think that your beliefs are genuinely true;
- ii. *the ability to find an impartial solution*, which involves learning to recognize and control your own biases, coming to view your own beliefs with the same detachment with which you view the beliefs of others, judging issues on their merits, trying to ascertain the relevant facts, and the power of weighing arguments;
- iii. *the ability to identify and question assumptions*, which involves learning not to be credulous, applying constructive doubt in order to test unexamined beliefs, and resisting the notion that some authority, a great philosopher perhaps, has captured the whole truth.

In nurturing these skills, educators need to remember that our most unquestioned convictions *may* be as mistaken as those we criticise or our opponents. Our account of critical skills should meet the test

and criteria of tools of evaluation, namely: clarity, accuracy, precision, relevance, depth, breadth, and logic

There are numerous insights in this effort which have a familiar ring to those acquainted CBE, and with the recent Critical thinking literature:

- a) First is the emphasis on *judgement*, suggesting the point that critical skills cannot be reduced to a mere formula to be routinely applied. Critical judgement means that one has to *weigh* evidence and arguments, approximate truth must be *estimated*, with the result that skill demands wisdom.
- b) Second is that critical thinking requires being critical *about our own attempts at criticism*. For example, we need to recognize that refutations are rarely final; they are usually a prelude to further refinements. We must also be cautious to reject the notion that critical thinking texts restrict criticism to "approved" topics and that punishment awaits those who wander into unconventional fields of criticism. Critical thinking must include critical reflection on what passes for critical thinking.
- c) Third, critical thinking is not a negative enterprise; our emphasis on *constructive* doubt, and warning against practices that lead to children becoming *destructively* critical is positive skepticism. It is important that the kind of criticism aimed at is not just that which seeks to reject, but that which consider apparent knowledge on its merits, retaining whatever survives critical scrutiny.

4.3.2 Dispositions of Education in the Critical Faculty

The mere possession of critical skills is not sufficient to make one a critical thinker or fully developed individual. We must draw our attention to certain *dispositions* which will guarantee that the relevant skills are actually exercised. A number of names can be used to refer to these dispositions- *habits* or the notion of *practice* to suggest the translation of skills into actual behaviour. In this respect, education can be understood as the formation, by means of

instruction, of certain mental habits [and a certain outlook on life and the world]. Of great importance among these dispositions are:

- i. *the habit of impartial inquiry*, which is necessary if one-sided opinions are not to be taken at face value, and if learners are to arrive at conclusions that do not depend solely on the time and place of their education;
- ii. *the habit of weighing evidence*, coupled with the practice of not giving full assent to propositions which there is no reason to believe true;
- iii. *the habit of attempting to see things truly*, which contrasts with the practice of merely collecting whatever reinforces existing prejudice; and
- iv. *the habit of living from one's own centre*, a kind of self-direction, certain independence in the will.

These habits have to be exercised intelligently. Although this can be problematic at times, it's the duty of the "teach for critical thinking" educator to address. One becomes a victim of habit if the habitual beliefs of one's own age constitute a prison of prejudice. Hence the need for a *critical* habit of mind.

Since these habits are not simply automatic responses in which one has been drilled, such intellectual habits, in effect reflect a person's willingness; call it one's *readiness*, to act and respond in various ways. For example:

- i. *a readiness to admit new evidence against previous beliefs*, which involves an open-minded acceptance (avoiding credulity) of whatever a critical examination has revealed;
- ii. *a readiness to discard hypotheses that have proved inadequate*, where the test is whether or not one is prepared in fact to abandon beliefs that once seemed promising; and,
- iii. *a readiness to adapt oneself to the facts of the world*, as opposed to merely going along with whatever happens to be in the ascendant, which might be evil, wrong and misleading; to be ready to act, or react in this way suggests both

awareness that the habits in question are appropriate and a principled commitment to their execution is justifiable.

These dispositions have in common the virtue of *truthfulness*, which entails the wish to find out and try to be right in matters of belief.

4.3.3 Traits of Education in the Critical Faculty

Beyond the skills and dispositions, a certain set of *attitudes* characterize the outlook of a critical person. By critical attitude, we mean a temper of mind central to a certain stance with respect to knowledge and opinion; it involves:

- i. *a realization of human fallibility*, a sense of the uncertainty of many things commonly regarded as indubitable, bringing with it humility;
- ii. *an open-minded outlook* with respect to our beliefs, an "inward readiness" to give weight to the other side, where every question is regarded as open and where it is recognized that what passes for knowledge is sure to require correction;
- iii. *a refusal to think that our own desires and wishes provide a key to understanding the world*, recognizing that what we choose to like has no bearing whatsoever to what is;
- iv. *being tentative, without falling into a lazy skepticism* (or dogmatic doubt), but holding one's beliefs with the degree of conviction warranted by the evidence. This entails having a strong desire to know, combined with great caution in believing that what one knows must meet the test of certainty and proof. It entails assurance that open-mindedness does not become degenerate into being mindless.

A number of phrases capture the ideal of critical thinking as a component of Competence Based Education (CBE), including the philosophic spirit and a philosophical habit of mind, the liberal outlook (or even the liberal creed), and the rational temper. All of these ideas are closely intertwined. The critical outlook, therefore, reflects an epistemological and ethical perspective that emphasizes:

how beliefs are held i.e., not dogmatically; *the doubtfulness* of all beliefs; *the belief* that knowledge is difficult but not impossible; freedom of opinion, *truthfulness*, and *tolerance*.

4.4 Relevance of Critical Thinking to CBE in Kenya

Kenya's developmental trajectory is intricately shaped by a triad of deeply intertwined social, economic, and political challenges. Socially, the nation grapples with persistent systemic inequalities, ethnocentric divisions that frequently threaten national cohesion, and inadequate access to high-quality healthcare and education. Economically, these vulnerabilities are compounded by a severe cost-of-living crisis, unsustainable public debt, and high rates of youth unemployment within a heavily informal economy. These issues are further exacerbated by political factors, including entrenched corruption, weak institutional governance, and recurring cycles of electoral instability. For critical thinking, analyzing Kenya's predicament requires examining how these three dimensions intersect - specifically, how political governance directly drives economic policy and either alleviates or deepens social disparities.

Integrating Critical Thinking and Problem Solving into subject domains aims at equipping a new generation with requisite abilities to dissect and resolve Kenya's unique social, economic, and political hurdles.

a. Solving Social Problems

Kenya faces significant social challenges, including negative tribalism, corruption, and healthcare inequalities. Critical thinking through CBE directly addresses these by:

- i. *Eradicating Tribalism:* CBE promotes "Citizenship" as a core competency. Critical thinking compels learners to question inherited prejudices, deconstruct stereotypes, and appreciate diversity, thereby fostering national unity and social cohesion.

- ii. *Combating Corruption:* Instead of accepting the status quo, critical thinkers evaluate the moral and social consequences of their actions. Integrated value education in CBE instills social justice and personal accountability from young age to university level education.
- iii. *Deconstructing Misinformation:* Learners are trained in digital literacy and evaluation. This helps them filter out fake news, online propaganda, and radicalization tracks that threaten social stability.

b. Solving Economic Problems

High youth unemployment, over-reliance on traditional agriculture, and a lack of industrial innovation stall economic growth. Critical thinking changes the economic landscape through:

- i. *Fostering Entrepreneurship:* CBE shifts focus to what learners can *do*, rather than what they *know*. Critical thinking allows youth to identify local market gaps, calculate financial risks, and create self-employment opportunities rather than waiting for formal jobs.
- ii. *Driving Applied Innovation:* Through practical, real-world school projects, students are encouraged to design creative solutions. They apply critical thinking to resolve major national resource hurdles, like developing smart, sustainable farming methods or eco-friendly waste management solutions.
- iii. *Aligning Skills with Global Markets:* A workforce trained to think critically can easily adapt to technological advancements, ensuring Kenya remains competitive in the global digital economy.

c. Solving Political Problems

Political issues in Kenya often stem from voter manipulation, lack of accountability, and weak civic

engagement. Critical thinking serves as a democratic shield by:

- i. *Promoting Informed Democratic Choices:* Critical thinking enables citizens to objectively evaluate political deceit, manifestos and policies instead of being swayed by populist rhetoric, handouts, or ethnic alignments.
- ii. *Demanding Accountability:* CBE empowers future civil society members to monitor governance. An analytical electorate can track public expenditure, critique legislative actions, and legally hold leaders accountable for their campaign promises.
- iii. *Constructive Conflict Resolution:* Political disputes in Kenya historically overflow into violence. CBE emphasizes communication and negotiation. Critical thinking helps citizens engage in peaceful dialogue, balance varying political opinions, and prioritize the country's stability over political polarization.

SECTION FIVE

Pedagogy for Critical Thinking

5.0 Introduction

Pedagogy for critical thinking is a teaching method that helps learners question facts, analyze arguments, and form independent judgments. Instead of just memorizing information, students learn how to evaluate evidence, spot hidden biases, and solve complex problems in real life.

The main objective for this approach is to enhance learners' abilities by encouraging them to ask open-ended questions especially those that do not have a single simple answer; to encourage the examination of assumptions that helps learners to see and know that personal beliefs and cultural views shape how they see facts and the world; building reasoning capacities which are instrumental to connecting claims with solid proofs; and by encouraging them to value different views by understanding the importance of listening to other opinions with an open mind.

In this kind of learning environment the teacher acts as a guide, creates safety by letting learners to share ideas without fear of being wrong, and acts as a model for curiosity by mitigating to learners search for truth and admit mistakes.

The learner on the other hand is guided into thinking deeply by looking past the surface of any topic or text, test ideas by asking is the data is true, accurate, current, and fair, and, reflects inwardly by looking at their own thought and changes them when new facts emerge.

5.1 Instructions for Critical Thinking

As earlier stated, critical thinking is the systematic process of objectively analyzing, evaluating, and synthesizing information to

form a reasoned judgment. It requires moving past intuitive "gut feelings" and emotional reactions to look at data, evidence, and alternative viewpoints. In order to achieve the necessary skills for such a task involves moving away from rote memorization toward active engagement. Core methods include using Socratic questioning, problem-based learning tasks, structured peer discussions, and reflective writing. These methods help learners analyze evidence, challenge assumptions, and justify reasoned conclusions regardless of the specific subject. Some of the most recommended across disciplines' pedagogical methods include:

5.1.1. Socratic Questioning Method

The Socratic Questioning is a disciplined, active learning tool based on Socrates (an ancient Greek philosopher). It uses focused, open-ended questions to unpack ideas, test core beliefs, and build critical thinking. Instead of lecturing facts, it prompts learners to discover and justify insights independently. The key elements of the method includes active inquiry where learners are encouraged to reflect, talk, and think instead of just listening and taking notes; teachers guide with more questions rather than providing answers or final verdicts; and challenges hidden biases as it uncovers weak logic through deep reflection.

The six main types of Socratic Questioning are: i) Clarification – ("What do you mean by that? Can you give an example?"); ii) Probing assumptions – ("Is this always true? What are we taking for granted?"); iii) Evidence and reasons – ("What facts support your view? How do we know this is true?"); i\]

v) Viewpoints and perspectives – ("Is there another way to look at this? Who might disagree?") ; v) Implications and consequences – ("If this happens, what else becomes true? What does this mean for our goal?"); and, vi) Questioning the question – ("Why was this a useful question to ask? Where should we focus next?").

By encouraging learners to ask open-ended questions that prompt them to evaluate source credibility, explore implications, and uncover hidden assumptions rather than repeating facts, the

Socratic Method cultivates the mind into critical spirit. The method encourages *Problem-Based Learning (PBL)* - Presents real-world, open-ended problems requiring collaborative data analysis, hypothesis testing, and multi-perspective solution building; *Active Discourse and Debate* -Facilitates structured controversies, peer discussions, and debates where learners must verbally defend or critique logical arguments; *Metacognitive Reflection* - Uses targeted journaling and pause-and-reflect checkpoints so students consciously evaluate their own reasoning processes; and, *Case Study Analysis* - an active, discussion-based teaching strategy where learners analyze real-life or hypothetical scenarios containing complex dilemmas. Rather than passively receiving facts, learners step into the shoes of a decision-maker, evaluate ambiguous data, weigh competing solutions, and defend their logical judgments.

5.1.2. Cognitive Activation

Cognitive activation is a teaching method that pushes learners to think deeply, solve problems with no obvious answers, and focus on the reasoning process rather than just memorizing facts. It builds critical thinking by using challenging questions, creating cognitive conflicts, and prompting students to justify their own ideas. The key elements of cognitive activation include: i) *Challenging Tasks* - Present problems that require higher-order thinking, analysis, and multiple steps rather than simple recall. ii) *Cognitive Conflict* - Introduce contradictory evidence, opposing viewpoints, or surprising results that disrupt routine thinking and force learners to re-evaluate their beliefs; and, *Instructional Dialogue* - Use guided discussions and open-ended questions where students must explain, defend, and critique different solution paths.

The main Strategies for the classroom include: i) *Ask Why and How* - Replace basic "what" questions with prompts that require justification, evaluation, and comparison; ii) *Encourage Multiple Approaches* - Guide and allow learners to choose their own procedures or methods to solve complex, open-ended problems; iii) *Make Thinking Visible* - Model a "think-aloud" process to show how

you weigh competing evidence and handle uncertainties; and, iv) *Promote Peer Discussion* - Require students to talk through their logic with others to stress-test their arguments and uncover hidden biases

Although the Socratic Method embraces most of the techniques used in teaching for critical thinking, the method can be further split in various segments. These segments are discussed here-below.

1. ***Active Learning:*** Involve learners directly instead of relying on passive lectures. Key strategies of this method include:
 - a) *Discussions and debates:* Encourage learners to share ideas and insights.
 - b) *Problem-solving exercises:* Apply concepts to real-world scenarios.
 - c) *Role-playing:* Practice scenarios such as handling a crisis or leading a meeting.
 - d) *Group projects:* Foster teamwork, communication, and sharing of diverse perspectives.

Among the benefits of this approach include:

- i. Boosts knowledge retention and practical skill-building.
 - ii. Makes learning engaging, interactive, and immediately applicable.
 - iii. Supports self-directed learning and collaboration.
2. ***Experiential Learning:*** This method helps learners to gain knowledge by doing, not just reading or listening. Learners will be able to apply skills in real-life situations, then reflect to deepen understanding and improve performance. Key strategies for this approach include:
 - a) *Internships:* Provide hands-on practice in real work settings, building confidence and institutional experience.

- b) *Simulations*: Offer safe practice environments, such as virtual reality training for healthcare, engineering and other practical-based in diverse fields.
- c) *Job shadowing*: Let learners observe professionals, gaining insight into workplace processes and practical skills.
- d) *Projects and case studies*: Connect theory to real-world scenarios, reinforcing learning and problem-solving abilities.

Among the benefits of this approach:

- i. Enhances practical skills and knowledge application.
 - ii. Boosts confidence and workplace readiness.
 - iii. Helps learners connect theory to real-world challenges.
3. ***Problem-Based Learning (PBL)***: In using this method the lecturer helps the learner to tackle real-world challenges rather than memorizing facts. This approach develops critical thinking, problem-solving, and independent learning skills. Key strategies include:
- a) *Real-world challenges*: Present learners with authentic problems to research, analyze, and solve.
 - b) *Collaborative teamwork*: Encourage group discussions, idea-sharing, and collective solution-building.
 - c) *Self-directed research*: Promote independent exploration, helping learners take ownership of their learning.
 - d) *Case studies*: Use complex scenarios to connect theory with practical application.

Benefits of this method include

- i. Building critical thinking and decision-making skills.
- ii. Encourages collaboration and communication.
- iii. Prepares learners for real-life professional situations.

iv. Boosts confidence and career readiness.

4. ***Collaborative Learning:*** helps learners to absorb knowledge more effectively by working together rather than studying alone. Learners share ideas, discuss topics, and solve problems as a team, making sessions interactive and engaging. Main strategies include:

- a) *Peer teaching:* Let learners take turns explaining concepts, and reinforcing understanding for both speaker and listener.
- b) *Study groups:* Provide support, motivation, and accountability to keep learners on track.
- c) *Brainstorming sessions:* Encourage creativity by allowing everyone to contribute ideas and build on others' thoughts.
- d) *Team projects:* Promote problem-solving, decision-making, and communication skills.

Benefits include:

- i. Enhanced understanding through discussion and explanation.
- ii. Improved teamwork, communication, and collaboration skills.
- iii. More interactive, enjoyable, and practical learning experience.
- iv. Supports engagement and motivation in learners.

5. ***Blended Learning:*** This approach combines online and in-person training to give learners flexibility while maintaining engagement. Learners can complete digital modules at their own pace and attend face-to-face sessions for hands-on practice. Key strategies include:

- a) *Online modules:* Videos, quizzes, and interactive lessons enhance understanding.

- b) *In-person sessions*: Facilitate practice, group discussions, and immediate feedback.
- c) *Flexible scheduling*: Allows learners to balance work, personal life, and learning.
- d) *Integrated projects*: Combine digital learning with practical application in real settings.

Some of the benefits of this mode of teaching include:

- i. Increased flexibility and accessibility.
- ii. Enhanced knowledge retention through multiple formats.
- iii. Encourages interaction and hands-on learning.
- iv. Balances self-paced learning with collaborative experiences.

6. ***Microlearning***: This approach simplifies learning by breaking information into small, focused lessons that fit busy schedules. This method improves retention and makes learning more manageable. Main strategies for lecturers include:

- a) *Short videos*: Explain key concepts in a micro learning video for quick understanding.
- b) *Quick quizzes*: Reinforce knowledge immediately after learning.
- c) *Infographics and visuals*: Simplify complex ideas into digestible content.
- d) *Modular content*: Allow learners to progress step by step at their own pace.

Benefits are:

- i. Fits learning into short breaks or busy days.
- ii. Enhances knowledge retention and recall.
- iii. Keeps learners engaged with concise, focused content.

- iv. Ideal for on-the-go learning in professional settings.

Platforms such as Coursebox AI makes it easy to create microlearning modules, track learner progress, and deliver interactive, bite-sized content that adapts to individual schedules

- 7. ***Coaching and Mentoring:*** Coaching and mentoring support learning through one-on-one guidance, feedback, and personal support. Learners gain practical advice, build confidence, and achieve personal or career goals. However, make sure you understand the difference between coaching, training, and mentoring before trying any of these methods. Strategies for the lecturer include:

- a) *Leadership mentoring:* Provide insights and strategies to handle workplace challenges.
- b) *Skill coaching:* Offer personalized feedback to help learners' master specific skills.
- c) *Peer mentoring:* Pair learners for mutual support, knowledge sharing, and accountability, among other benefits of peer learning.
- d) *Structured programs:* Combine formal coaching sessions with informal guidance for consistent growth.

Benefits include:

- i. Improves skill development and professional growth.
- ii. Builds confidence and motivation.
- iii. Offers personalized, actionable guidance.
- iv. Strengthens learner-mentor relationships for long-term impact

5.2 Elements of Critical Thinking Pedagogy

Critical thinking pedagogy is not merely a method of instruction; it is an awakening of the intellect to its own depths and boundaries.

At its foundation lie listening, explanation, flexibility, and fairness - the virtues of intellectual humility. To listen in a philosophical sense is to practice *epoché*, a deliberate suspension of judgment, allowing the voice of the “Other” to exist in its fullness before any critique begins. This deep reception prepares the mind for explanation, which transforms raw thought into shared logos. Explanation in this pedagogy is not a rigid transmission of facts, but an act of translation that uncovers the hidden structures of understanding. It is guided by flexibility - the mind’s capacity to bend without breaking, to abandon cherished dogmas when confronted with superior truth. This intellectual fluidity is anchored by fairness, a radical ethical commitment to treat opposing viewpoints with the same charity and rigor that we naturally afford our own.

Beyond these relational virtues, the pedagogy demands a rigorous ascent toward truth through objectivity, evaluation, analysis, and research. Objectivity functions as a regulatory ideal; while absolute neutrality may elude the human condition, the critical mind continuously strives to step outside its own subjective shadows to view reality with unclouded vision. This clear sight enables analysis, the methodical dismantling of complex concepts into their primal, constituent parts to examine how they hold together. Once dissected, these elements undergo evaluation, a normative judgment where arguments are weighed not by emotional appeal, but by the gravity of their logic and evidence. This entire philosophical journey is fueled and sustained by research - the restless, disciplined inquiry that refuses to accept the surface of things, digging beneath appearance to uncover the foundational truths of the world. These elements are demonstrated below.



SECTION SIX

Teach For Critical Thinking

6.0 Introduction

Implementing Competency-Based Education (CBE) at the university level in Kenya requires paradigm shift, reconfiguration of educators’ mindset, and a radical departure from the 8-4-4 system legacy. Instead of lecturing for memorization and high-stakes end-of-semester exams, university lecturers must adopt active, learner-centered methodologies. This shift aligns with the Commission for University Education (CUE) guidelines to foster Critical Thinking and Problem Solving – the core foundational umbrella to CBE framework

In order to be effective in this transition, educators must, first and foremost distinguish between “*Teaching Critical thinking*”, and “*Teach for Critical thinking*”. In regard to the CBE educational goals, there is a big difference, and the ability to attain what CBE is intended to, this distinction is vital. The fundamental difference lies in **what is treated as the subject matter** versus **how the entire learning environment is designed**. Teaching critical thinking treats analysis as an explicit topic or toolset to be studied, whereas teaching *for* critical thinking infuses analytical depth directly into the mastery of core course content. A direct comparison between the two below reflects these differences.

Feature	Teach Critical Thinking	Teach For Critical Thinking
Primary Focus	The mechanisms of thought	Deep understanding of content
Instruction Mode	Explicit, direct instruction.	Embedded, immersive practice.

Typical Topics	Logical fallacies, cognitive biases.	Domain concepts, historical context
Student Output	Identifying errors in sample arguments.	Solving complex, open-ended problems.
Role of Teacher/Lecturer	Instructor delivering a toolset.	Facilitator structuring inquiry.

6.1 Teach Critical Thinking

Teach Critical Thinking (The Tools) put emphasis on treating critical thinking as a distinct discipline or standalone skill that can be achieved through immersing learners in specific topics. It lays emphasis on the teacher/lecturer teaching vocabulary and mechanics of logic and other related topics such as fallacies, barriers to critical thinking, tools of critical thinking, appearance and reality, etc. The main goal for this approach is to ensure that students grasp cognitive processes and structural evaluation through mastery of the topics taught. The method used in the delivery of direct lessons focus on metacognition, heuristics, and syllogisms. For example, a professor explicitly teaches a unit on identifying logical fallacies or evaluating Socrates beliefs.

6.2 Teach *For* Critical Thinking

Teach *For* Critical Thinking (The Application) on the other hand shifts the entire classroom dynamic so that learners must actively use reasoning to learn the standard curriculum. The focus is on the environment and the nature of tasks assigned. The approach focuses on infusing critical thinking directly into instructional methods which then acts as the operational engine to build capacity and cultivate the requisite skills. While traditional lecture methods only transmit information with minimal practical aspects, critical thinking-driven instruction force learners to actively process, challenge, and apply that information. By restructuring how faculty

teach, students are forced to practice the exact behavioral traits that define every core CBE competency domain. Objective goal here is to move past rote memorization and cultivate an analytical disposition within subjects' domains. Common and relevant method used are case studies, structured debates, and open-ended inquiry. For example, instead of lecturing on a historical event, a lecturer/teacher gives students conflicting primary source documents and tasks them with reconstructing the historical timeline.

The difference between these two approaches lie in treating critical thinking as a **distinct subject** versus using it as a **method for delivery**. *Teach critical thinking* means making it the explicit content of a lesson (learning *what* analysis, bias, and logic are), while *Teach for critical thinking* means designing instruction so students use analytical habits to master regular subject matter with respective subject/disciplines domains.

While Teach Critical Thinking direct its focus specifically on lessons aimed at naming and unpacking logical fallacies, cognitive biases, or argument structures, teach for critical thinking employs an embedded approach that focuses on the use of active questioning, debates, and problem-based tasks where analysis happens naturally in its content delivery. And whereas the former employs a standalone approach, where specific frameworks like argument mapping, validity tests, or the SODAS method (Situation, Options, Disadvantages, Advantages, Solution) is the norm, the later embraces implicit practice where learners evaluate historical perspectives or scientific data trends without a separate "logic 101" lecture.

In matters of grading, the former uses a direct evaluation criteria where grades measure how well a student identifies a flaw in reasoning rather than just the factual answer, while the later evaluates learners indirectly based on the mastery of the subject (like science or history) which is shown through deep, justified problem-solving.

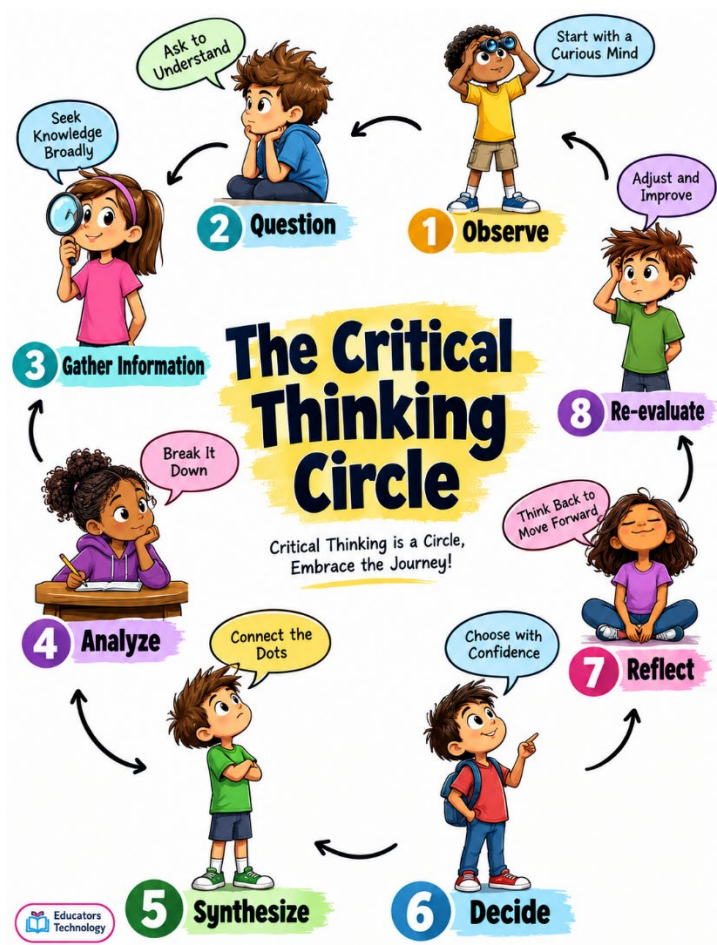
Although Competency-Based Education (CBE) does not formally use any specific linguistic distinction in its core policy documents, it treats critical thinking as an embedded core competency and a practical learning outcome. This has created a problem of interpretation and affected the realigning of both the university curriculum, and capacity building of the academic staff who are supposed to implement the system effective from 2029. Even as the universities endeavor to produce teachers for the pre-primary, primary and senior schools, the problem of how to integrate critical thinking within the subject domains or to teach it as a distinct subject still persist.

The CBE approach, however, puts emphasis on the: i) *Integrated Competency* - treats Critical thinking as an overarching skill applied across all learning areas rather than taught as a standalone theoretical subject; ii) *Process over Content* - shifts instruction from rote memorization of facts to the active deployment of problem-solving, reasoning, and real-life application; and, iii) *Performance-Based Mastery* - emphasizes the need for learners to be evaluated on demonstrated competencies and experiential tasks rather than time spent sitting in a classroom

The distinction between “teach critical thinking”, and “teach for critical thinking” is important to preparing the university faculty (members of staff) into the implementation of the CBC and the entire CBE system. Often, it has been a tradition in Kenyan universities to believing that teaching students’ content dubbed critical thinking will eventually translate them into critical thinking spirits. Little effort has been taken to shift the approach to teach for critical thinking as a means to cultivating learners cognitive potency through targeted reflective journaling, simulation, puzzles, inquiry-based learning, concept mapping, case studies & scenarios, Socratic Method, etc.

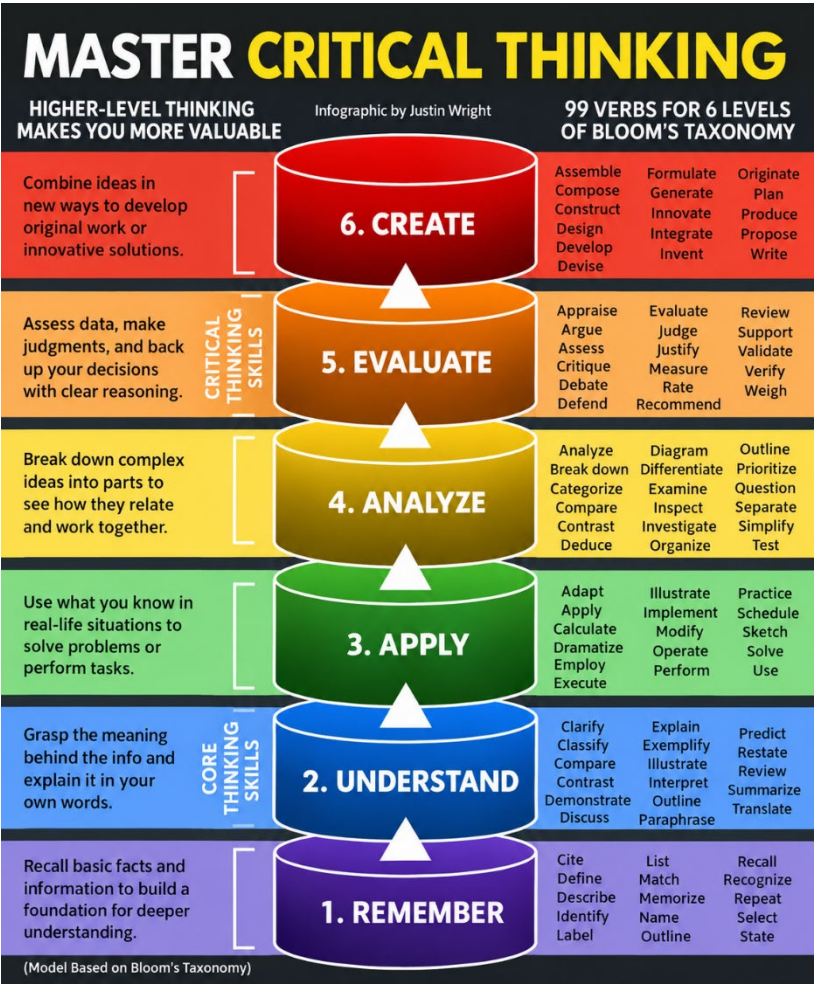
The above distinction amplifies the overall role of education in human development. As Martin Luther King Jr. rightly observed; *“The function of education is to teach one to think intensively and to think critically. Intelligence plus character - that is the goal of true education.”*

By adopting the teaching of critical thinking within subjects domains we will not only be reducing the burden of unnecessary baggage of extra common university units, but we will be enabling the learners to holistically develop critical thinking skills within their fields of study. By so doing, the goal of CBE to develop an all-round individual will be realized. Our critical thinking circle will be comprehensively all-round within subjects' domains as demonstrated in the diagram below.



Council For Critical Thinking (USA) 2022

The above image demonstrated the knowledge structure as recommended by Blooms Taxonomy, captured in the rephrased graphics below.



Justin Wright 2025

6.3 Value of Teach for Critical thinking

When designing instruction to **teach *for* critical thinking**, our objectives shift away from rote memorization and toward deep

processing. The goal is to use the existing subject matter (like history, science, or literature) as a vehicle to build long-term intellectual habits.

In this regard, the primary objectives of teaching *for* critical thinking, will, in practice be as follow:

- i. *Shift from Passive Learning to Active Evaluation:* Instead of students merely absorbing and repeating facts, the objective is to get them interacting with the information;
 - ✓ *Objective:* Students will interrogate sources, data, or texts rather than accepting them at face value.
 - ✓ *In practice:* Instead of memorizing the causes of a historical event, students evaluate the reliability of primary sources from that era and debate which cause was most significant.
- ii. *Foster Justified Decision-Making:* Students shouldn't just arrive at an answer; they must be able to defend the cognitive pathway they took to get there.
 - ✓ *Objective:* Students will provide evidence-based rationales for their conclusions and solutions.
 - ✓ *In practice:* In a mathematics or coding class, students aren't just graded on the final correct number, but on their ability to explain *why* they chose a specific formula or strategy over another.
- iii. *Encourage Metacognition (Thinking about Thinking):* Teaching *for* critical thinking aims to make students aware of their own learning processes, blind spots, and assumptions.
 - ✓ *Objective:* Students will monitor, assess, and regulate their own thinking when solving complex problems.
 - ✓ *In practice:* After completing a project, students complete a self-reflection identifying where their

original assumptions were wrong and how they adapted their strategy.

- iv. *Cultivate Cognitive Flexibility and Perspective-Taking:* In a complex world, problems rarely have a single, straightforward answer. This objective builds the stamina to handle ambiguity and contradictory confusions.

✓ *Objective:* Students will analyze a single issue through multiple viewpoints and weigh competing pieces of evidence.

✓ *In practice:* In a literature or ethics class, students analyze a conflict from the perspective of three different characters or stakeholders to understand that "truth" can be multi-faceted.

- v. *Promote Transfer of Knowledge:* The ultimate objective of Teach for Critical thinking is ensuring that the analytical habits built in our classrooms do not stay trapped in our classroom.

✓ *Objective:* Students will apply problem-solving frameworks and analytical mindsets to novel, real-world scenarios.

✓ *In practice:* Students use the data-analysis skills they learned in a biology unit to evaluate a real-world news article about a local environmental issue.

6.4 How to Teach Learners to Think Critically

A number of scholars maintain that to teach critical thinking effectively, it cannot be treated as a generic, standalone skill. Cognitive science shows that critical thinking is deeply intertwined with domain-specific knowledge; and that a learner cannot think critically about a subject he/she know nothing about.

According to educational psychologist Daniel Willingham, an effective framework for teaching critical thinking relies on a four-step progression, integrated directly into specific subject area.

a) Define Critical Thinking for Your Specific Domain

Critical thinking looks completely different depending on the discipline. You must explicitly identify what "thinking" looks like in your subject.

- *In History:* Sourcing documents, identifying political bias, and weighing conflicting accounts.
- *In Science:* Designing controlled experiments, isolating variables, and distinguishing correlation from causation.
- *In Math:* Identifying structural patterns, checking for logical fallacies in a proof, and optimization.
- *In Literature:* Analyzing subtext, evaluating thematic consistency, and questioning narrator reliability.

b) Build Deep Domain Knowledge First

Learners require factual information to anchor their reasoning. If a student does not understand the underlying science behind climate data, they cannot critically evaluate a scientific claim about it.

- Do not skip foundational memorization and comprehension.
- Use facts as the raw material for analytical tasks, rather than teaching abstract logic puzzles.

c) Structure and Sequence the Skills

Do not expect learners to jump into complex analysis automatically. Break down the cognitive load into a sequence of deliberate steps.

- *Sub-goal Labeling:* When teaching complex multi-step tasks (like chemical equations or mathematical proofs), explicitly label the strategic purpose of each stage (e.g., "*Step 1: Isolate the variable,*" "*Step 2: Balance the charges*"), rather than just showing the calculation.

- *Comparison & Analogy*: Present two problems that have different surface features but share the exact same underlying structural logic. This forces students to look past superficial data and see the core principle.

d) Explicitly Teach and Practice the Analytical Process

Do not just grade learners on whether their final answer is correct; explicitly teach them how to navigate the messy middle of problem-solving.

- ✓ Traditional Prompt —► "What caused the fall of the Roman Empire?" (**Memory retrieval**)
- ✓ Critical Prompt —► "Compare accounts X and Y. Justify which argument is more credible." (**Active analysis**)
 - *Use "Think-Aloud" Modeling*: Narrate your own cognitive hesitation. Show learners how you evaluate competing evidence, spot your own assumptions, and change your mind when a data point doesn't fit.
 - *Deploy "Magic Questions"*: Shift from a lecture format to a guided inquiry model using targeted prompts:
 - 🚦 "What makes you say that?" (Forces justification)
 - 🚦 "What does this conclusion depend on?" (Forces condition testing)
 - 🚦 "Can you argue the exact opposite perspective?" (Breaks confirmation bias)
 - *Design Scaffolded Checkpoints*: Alter assignments to embed mandatory pauses. Before students submit a final response, require them to list two counter-arguments or state the primary assumption their argument relies on

6.5 Manifestation of Critical Thinking abilities

The traits and dispositions of a critical thinker are manifest in the way a person's capacity process information objectively, logically, and reflectively. Rather than passively accepting claims at face value, a person with strong critical thinking skills demonstrates specific observable behaviors across their communication, problem-solving, and decision-making habits. Critical thinkers display maturity in reason, objectivity in thought, rationality in deliberations, and sobriety in character, and consistency in values and beliefs.

The above abilities manifest in various ways:

- a) **Investigative Questioning** - Critical thinkers do not accept facts blindly; they interrogate them by.
 - i. *Asking "Why" and "How":* Seeking the underlying mechanics of an issue rather than just observing the surface symptoms.
 - ii. *Using Socratic questioning:* Challenging premises by asking open-ended questions like, "*What evidence supports this conclusion?*"
 - iii. *Sifting intention:* Promptly identifying the motive or purpose behind a piece of communication.
- b) **Rigorous Information Evaluation** – Critical thinkers actively filter out noise, falsehoods, and cognitive traps.
 - i. *Verifying evidence:* Separating verified, empirical facts from unbacked opinions or emotional rhetoric.
 - ii. *Spotting logical fallacies:* Recognizing flawed reasoning, circular arguments, or sweeping generalizations.
 - iii. *Detecting bias:* Actively identifying personal blind spots, organizational biases, or media spin.

a) Objective Problem Framing & Analysis - Before rushing to a solution, a critical thinker dissects the architecture of a problem.

- i. *Deconstructing data:* Breaking down complex scenarios into smaller, manageable components to find patterns or gaps.
- ii. *Exposing assumptions:* Isolating the unstated beliefs or structural defaults built into a situation.
- iii. *Isolating variables:* Understanding how different elements interact with and affect one another.

c) Metacognition & Intellectual Humility - True critical thinking manifests heavily in a person's relationship with their own intellect.

- i. *Thinking about thinking:* Monitoring one's own cognitive processes to ensure decisions are rational rather than reactive.
- ii. *Prioritizing truth over ego:* Readily admitting mistakes or gaps in knowledge when presented with superior data.
- iii. *Suspending judgment:* Resisting the urge to make snap decisions until adequate information is collected.

d) Strategic Judgment & Foresight – Critical thinkers arrive at well-reasoned choices that account for future implications.

- i. *Weighing trade-offs:* Evaluating different paths objectively, recognizing that most solutions come with an inherent cost.
- ii. *Predicting consequences:* Foreseeing both short-term outcomes and long-term secondary ripple effects.

- iii. *Synthesizing perspectives*: Viewing a situation through multiple conflicting viewpoints before solidifying a stance.



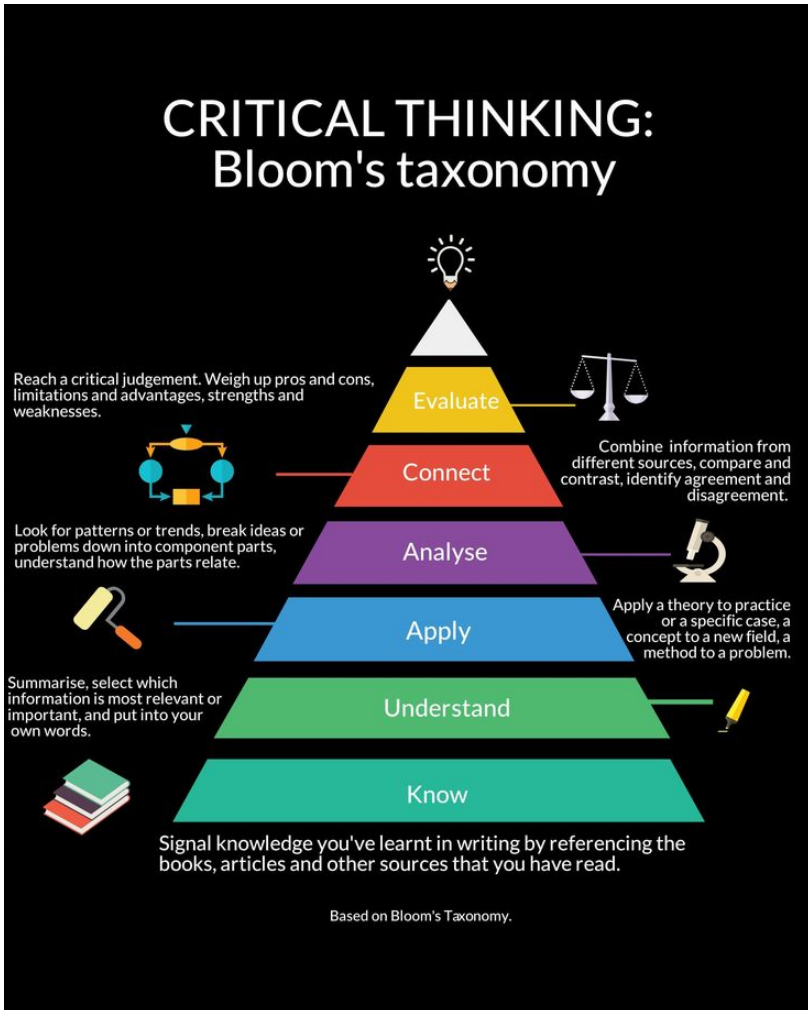
Foundation for Critical thinking, 2018

6.6 Frameworks of Teaching for Critical Thinking

To effectively teach and enable the learners to master the skills requisite for critical thinking, lecturers need to use structured frameworks to design lessons that naturally progress from basic understanding to higher-order critical thought. Among the recommended frameworks include:

- a) **Bloom's Taxonomy (Revised)**: This framework ranks cognitive skills from lowest to highest. To teach critical thinking, educators shift focus away from the bottom levels (*Remembering* and *Understanding*) and explicitly design tasks targeting the upper levels that focus on:
 - *Analyzing*: Structuring and relating information.

- *Evaluating*: Critiquing and judging based on criteria; and,
- *Creating*: Reorganizing elements into a new pattern or structure.



Research Gate – Based on Bloom's Taxonomy, 2024

- b) **Paul-Elder Critical Thinking Framework:** This robust model breaks critical thinking down into three distinct dimensions:
- i. *The Elements of Thought:* The building blocks of thinking (e.g., purpose, questions, assumptions, points of view).
 - ii. *The Universal Intellectual Standards:* The qualities used to judge the quality of thinking (e.g., clarity, accuracy, precision, relevance, depth); and,
 - iii. *Intellectual Traits:* The virtues a critical thinker develops (e.g., intellectual humility, empathy, integrity, and courage).
- c) **Harvard's Visible Thinking Routines:** These are short, easy-to-learn micro-strategies used regularly in classrooms to direct student thinking. Popular routines include:
- *See, Think, Wonder:* What do you see? What do you think about it? What does it make you wonder?
 - *Think, Puzzle, Explore:* What do you think you know? What puzzles you? How can you explore it?

It is evident that a robust framework of teaching for critical thinking transforms the instructional paradigm from the transmission of information to the cultivation of intellect. By deliberately structuring lessons around open-ended inquiry, scaffolded metacognition, and evidence-based justification, educators under CBE move beyond simply assessing what learners think to actively shaping how they think. This intentional pedagogical approach ensures that critical thinking is not treated as an accidental byproduct of schooling, but as a systematic, equitable, and measurable outcome that prepares learners for lifelong cognitive independence, and service to themselves, humanity, and to serve the world, intelligently.

SECTION SEVEN

Operationalizing CBE Critical Thinking Engine at Higher Education

For centuries, the university has existed as a secular temple of human knowledge, yet its modern incarnation is haunted by a quiet, Cartesian crisis: it has mastered the art of measuring what a student can memorize, while remaining profoundly blind to who that student is becoming and what they are truly capable of executing. We have inherited an educational architecture that treats the human mind as a passive vessel to be filled with fragmented data points, holding time constant in rigid semesters while allowing the actual depth of understanding to fluctuate as a volatile variable. This input-driven illusion collapses the moment a graduate steps out of the lecture hall and into a world that does not present itself as a neat series of multiple-choice options, but rather as an ambiguous, non-linear web of systemic crises. To move toward Competency-Based Education (CBE) is to stage an epistemological revolt against this passive inheritance, demanding that higher education realign itself with the pragmatic truth that knowledge is only real when it is actively weaponized to solve the dilemmas of existence. Yet, this shift introduces a profound philosophical challenge: if a competence is an intricate, living orchestration of internal reason, technical skill, and ethical character, how do we evaluate it without killing its essence through the mechanical reductionism of traditional grading?

The answer lies in realizing that we must stop treating critical thinking as merely one isolated item on a checklist of learning outcomes, and instead crown it as the foundational cognitive engine through which every other human capability is brought to light, tested, and verified. This intellectual transfiguration collapses the arbitrary Cartesian divide between knowing and being. By

elevating critical thinking to this central status, we uncover the ontological core of a mature, university-level Competency-Based Education (CBE) model: the realization that human capabilities do not exist as isolated, atomized silos. An authentic higher education framework must view this cognitive engine not as a discrete skill, but as the primary horizon through which all other competencies find their expression and validity. In this integrated pedagogical architecture, a student cannot manifest advanced digital literacy, intercultural communication, or professional ethics without simultaneously enacting a deeper, self-reflective critique of reality itself. By positioning critical thinking as the foundational lens of assessment, the educator transcends the hyper-reductionist trap of the spreadsheet, evaluating a wide matrix of subject-specific and generic capabilities through a single, indivisible performance. Ultimately, this approach rescues evaluation from mechanical utility, ensuring that university assessment honors the true, irreducible complexity of human praxis.

When evaluating *digital and informational literacy* through this lens, assessment moves far beyond checking if a student can operate software or write a basic string of code. Instead, critical thinking transforms the assessment into an evaluation of how a student investigates information ecosystems, tracks down algorithmic biases, and analyzes the validity of massive, conflicting data streams. For instance, in a computer science or data analytics program, a student demonstrates true digital competence not by simply building a predictive model, but by critically evaluating the historical training data for hidden systemic prejudices and forecasting the societal risks of deploying that model. By requiring students to defend their data selections and critique their own software architectures, the professor uses the tools of critical thinking to measure whether the digital competence is deeply understood or just mechanically copied.

Similarly, *intercultural competence and communication* cannot be authentically measured through shallow behavioral tests or simple vocabulary checklists; they must be evaluated by analyzing a

student's capacity for deep, critical perspective-taking. When communication is measured through a critical thinking framework, a university student must explicitly deconstruct the cultural assumptions, power structures, and historical contexts embedded within a specific discourse. In fields like international relations, business, or the humanities, this means assessing a student's ability to identify systemic biases within their own communication styles and strategically adapt their arguments to resonate across diverse cultural spaces. The assessment criteria focus directly on how well the student analyzes hidden subtexts, navigates cultural friction, and balances competing viewpoints, proving that true communication is an advanced intellectual act driven by analytical reasoning.

Furthermore, *professional ethics and civic responsibility* are completely dependent on critical thinking for authentic measurement, as memorizing a professional code of conduct is useless if a graduate cannot apply it to a real-world crisis. Measuring ethical competence through critical thinking requires students to audit complex, real-world case studies where multiple ethical values clash and no easy answer exists. In a medical, legal, or engineering faculty, an authentic assessment task forces students to map out the long-term, systemic consequences of a professional decision, expose hidden conflicts of interest, and challenge standard institutional practices. By evaluating the depth of the student's ethical reasoning, their awareness of systemic vulnerabilities, and their intellectual honesty during these simulations, the university gains clear, verifiable proof of an ethical competence that is resilient, practical, and fully prepared for the workplace.

When evaluating *leadership* through the lens of critical thinking, universities move away from treating leadership as a vague personality trait and instead measure it as an advanced cognitive capacity for strategic problem-solving in high-stakes environments. Authentic leadership assessment requires a student to critically audit complex institutional failures, identify systemic vulnerabilities, and evaluate the long-term, non-linear

consequences of organizational interventions. In a business, public administration, or military science program, a student demonstrates true leadership competence by entering an ambiguous crisis simulation and systematically deconstructing the cognitive biases, competing agendas, and ethical friction points within a team. The professor measures leadership not by how loudly a student speaks, but by the analytical rigour they apply to resource allocation, conflict resolution, and the strategic positioning of a group to achieve sustainable, real-world solutions.

Similarly, *creativity* is stripped of its romanticized, accidental mystique and measured as an explicit process of divergent thinking, analytical boundary-pushing, and systematic innovation. In a CBE framework driven by critical thinking, creativity is defined as the ability to dissect prevailing paradigms, expose hidden orthodoxies, and synthesize entirely new frameworks from seemingly disconnected fields of study. Whether in architecture, computer science, or the fine arts, a student proves their creative competence by explicitly mapping out the limitations of existing solutions and critically justifying why their novel approach is both viable and superior. The assessment criteria focus directly on the student's metacognitive awareness - their ability to explain *why* they rejected traditional methods, how they navigated structural constraints, and how they analyzed the real-world scalability of their innovative design.

When assessing *research skills potency*, critical thinking serves as the ultimate safeguard against academic fraud and mechanical data aggregation, shifting the target from simple information gathering to deep methodological critique. A university student demonstrates advanced research competence not by merely compiling a long list of citations, but by performing rigorous source auditing, identifying methodological flaws in published literature, and justifying their own epistemological frameworks. In an authentic assessment task, students must actively critique the sample sizes, potential variables, and historical biases of existing data streams before designing their own investigative tools. By requiring students to defend their data

triangulation choices and explicitly analyze the limitations of their own findings, the evaluator uses critical thinking to verify that the student is an independent, scientifically rigorous knowledge producer rather than a passive information copier.

Finally, measuring *patriotism* within a higher education CBE model requires a profound philosophical shift from blind, dogmatic indoctrination to an active, intellectually rigorous commitment to nation-building. Evaluated through critical thinking, patriotism manifests as a student's capacity to perform constructive, data-driven critique of their nation's current social, economic, and institutional realities. In disciplines like law, economics, or sociology, an authentic assessment of patriotic competence tasks students with analyzing systemic national crises, such as corruption, infrastructural decay, or economic inequality, and designing evidence-based policy solutions. The university evaluates patriotism by measuring the student's intellectual honesty, their deep understanding of constitutional values, and their analytical dedication to solving local problems, proving that true civic devotion is an active intellectual responsibility aimed at advancing human progress. This philosophical realignment demands that the entire curriculum be reimaged not as a repository of passive consensus, but as an operational arena where civic duty and intellect converge; to transform this lofty ethical mandate into a measurable academic reality, the structural architecture of the course must translate abstract virtues into concrete, specialized domains of human agency.

Consequently, to achieve a passing evaluation in their respective courses, students must successfully demonstrate six multi-dimensional target competencies: *leadership, creativity, research skills, communication/collaboration, digital and informational literacy, and patriotism* - each explicitly mapped to, and measured through, the operational tools of critical thinking.

Assessment in university courses must rely on criterion-referenced evaluation frameworks rather than traditional normative grading curves that sort and rank students against each other, ensuring that

progression and final accreditation are triggered exclusively by verified mastery of the stated competencies. Lecturers must utilize the Triangulation of Evidence method, compiling proof of student performance over time through three distinct channels: *direct faculty observation of real-time tasks*, *student-curated digital product portfolios*, and *metacognitive reflective self-assessments*. Students will be required to complete authentic, performance-based tasks modeled directly on real-world professional environments, such as oral defenses of complex research theses before faculty panels, real-time institutional crisis simulations, and data-driven civic project designs. Rather than receiving arbitrary percentage points, student work will be plotted along a *Four-Tier Developmental Rubric Matrix* that categorizes performance as *Below Expectation* (Novice), *Approaching Expectation* (Apprentice), *Meeting Expectation* (Proficient), or *Exceeding Expectation* (Expert). Continuous, qualitative formative feedback loops must be embedded throughout the duration of these tasks to mimic the professional peer-review process, turning mistakes into valuable milestones, cultivating a growth mindset, and building long-term student self-efficacy.

To operationalize this integrated assessment strategy, students will complete a comprehensive capstone initiative titled the *National Infrastructure and Institutional Crisis Simulation (NIICS)*, a project designed to simultaneously test and verify all six target competencies through the lens of critical thinking. Working in multi-disciplinary teams, students will be presented with a highly complex, unstructured real-world crisis scenario - such as a major regional supply chain failure, an algorithmic bias crisis in public data systems, or a severe public health and infrastructural breakdown.

To demonstrate *leadership*, students must critically audit the institutional failures that caused the crisis, manage team cognitive biases under pressure, and map out the non-linear risks of their proposed interventions. They must express *creativity* by breaking away from existing regulatory orthodoxies to engineer a novel, structurally viable, and scalable solution that reconciles competing

economic and social demands. The execution of this solution requires advanced *research skills*, as students must perform rigorous source auditing, evaluate the validity of conflicting data streams, and explicitly defend their chosen investigative methodologies before a faculty peer-review panel. Finally, students will anchor their projects in authentic *patriotism* by subjecting their own nation's current policies to a rigorous, data-driven critique, ensuring their final blueprint directly aligns with constitutional values and serves as a sustainable asset for local nation-building.

To guarantee the success of this sophisticated assessment model, the university will launch a mandatory, year-long *Faculty Competency Development Initiative (FCDI)* to equip instructors with the pedagogical and philosophical tools required to move beyond traditional rote grading. This institutional roll-out will shift lecturers away from binary answer keys and toward masterfully navigating multi-dimensional, criterion-referenced developmental rubrics. Faculty training will focus heavily on calibration workshops, where lecturers analyze anonymized student artifacts from the NIICS project to ensure consistent grading standards across departments, minimizing subjective bias and maximizing evaluation reliability. Additionally, instructors will be trained in the *Triangulation of Evidence* method, learning how to effectively manage digital student portfolios and embed continuous, qualitative formative feedback loops directly into classroom hours. By providing faculty with specialized training in cognitive coaching and formative dialogue, the university ensures that lecturers can smoothly transition from authoritarian text-deliverers into expert evaluators of human potential, capable of guiding students through complex intellectual failures and fostering long-term academic self-efficacy.

SECTION EIGHT

Critical Thinking as Subject Specific Ecosystem

8.0 Introduction

The transformation of an educational environment from a space of passive compliance to an arena of active intellectual inquiry relies entirely on the default language used within the classroom. When educators rely on traditional, recall-based phrasing, they inadvertently reinforce the illusion that knowledge is a static, pre-packaged commodity to be memorized rather than an ongoing conversation to be contested. To truly embed critical thinking within a specific field of study, instructors must consciously audit and redesign their verbal and written prompts. By reframing routine questions to target the unique epistemic rules, boundary constraints, and unstated assumptions of the discipline at hand, educators force students to move past simple fact retrieval. This linguistic shift acts as the practical engine of the integrated approach, transforming daily dialogue into a continuous exercise in domain-specific critique and intellectual autonomy.

The practice of separating critical thinking from the substantive matter of human inquiry reduces an essential intellectual habit to an abstract game, detached from the concrete realities it is meant to navigate. When partitioned off as an independent discipline or a standalone course, critical thinking lacks the necessary friction provided by rich, domain-specific content, leaving learners with theoretical tools they rarely know how to apply to complex, messy situations. True analytical reasoning requires a structural canvas to act upon; it cannot be practiced in a vacuum, nor can it be mastered through generic exercises that pretend knowledge is uniform. By seamlessly infusing critique directly into the core fabric of any given field of study, the act of learning a concept becomes entirely

synonymous with evaluating its underlying assumptions, boundaries, and validation metrics.

This integrated approach is philosophically necessary because the very standards of evidence, logic, and justification change drastically as an inquirer moves from one domain of human knowledge to another. A universal, generic thinking skill is a pedagogical myth; a mind trained exclusively in formal deductive reasoning will stumble when faced with the conflicting testimonies of historical archives, just as empirical validation metrics cannot fully untangle the nuanced metaphor of a literary text or the systemic variables of social architecture. Teaching critical thinking within specific domains allows learners to master the unique epistemic rules that govern different fields. They learn to adapt their skeptical lens to the precise nature of the material at hand, developing a fluid intellectual agility rather than a rigid, one-size-fits-all checklist.

Furthermore, embedding critical reflection within specific disciplines transforms the educational ecosystem from a space of passive memorization into a living, ongoing dialogue. It dismantles the artificial divide suggesting that a learner must first absorb vast amounts of unexamined data before earning the right to think deeply about it, showing instead that comprehension and evaluation are inseparable parts of the same cognitive process. When critique and content are delivered together, errors are elevated from simple failures into vital conceptual turning points that reveal hidden assumptions or structural misalignments. Students learn to deconstruct the dominant frameworks, historical biases, and unstated paradigms inherent to the field they are exploring. This embedded methodology ultimately fosters a permanent habit of metacognitive awareness, turning domain-specific insights into a cohesive, lifelong capability for autonomous thought and objective inquiry.

Isolating critical thinking into an independent subject inadvertently signals to learners that analytical reasoning is merely an occasional exercise - a specific textbook to open or a distinct exam to pass

before returning to uncritical compliance across the rest of their education. When logic is partitioned into its own silo, the remainder of the curriculum is stripped of its intellectual vitality, reducing rich subject matters to static storehouses of facts to be memorized rather than living traditions to be contested. Infusing critique directly into the daily fabric of domain learning breaks this illusion. It demonstrates to the learner that no piece of knowledge arrives pre-packaged and flawless, and that every academic arena is defined not by its final conclusions, but by its ongoing, foundational arguments.

By forcing students to confront the messy, chaotic, and incomplete data inherent to actual fields of study, embedded critique prepares them for authentic professional and civic challenges. Clean, artificial logic puzzles found in generic thinking courses rarely mimic the ambiguous problems of real life, where conflicting interpretations must be weighed in real time. When analytical tools are taught alongside specific content, students build the cognitive stamina required to tolerate uncertainty within that field. They discover that progress within a discipline rarely involves choosing between an obvious right and wrong answer, but rather managing competing probabilities, identifying missing variables, and identifying systemic flaws.

This domain-specific integration also provides a direct gateway to understanding the ethical dimensions and human impacts of applied knowledge. When critical reflection is woven into technical or professional training, students are forced to confront the immediate moral consequences of their work rather than discussing ethics as an abstract philosophical luxury. They learn that technical proficiency is incomplete - and potentially dangerous, without a continuous evaluation of systemic outcomes and human dignity. By embedding this reflective habit directly into the specialized content, education ensures that future experts possess the moral clarity to balance innovation with responsibility.

Additionally, embedding critical thinking helps students understand that the methodologies and tools they use daily are themselves products of historical evolution, not absolute,

unchanging truths. Every domain carries its own ingrained habits of mind and institutional frameworks that heavily influence how practitioners view reality. If critique is taught from the outside, these deep-seated systemic biases remain completely hidden and unchallenged. Forcing students to pull back the curtain on a discipline's dominant paradigms while they are actively learning them allows them to see the field as an open, evolving conversation that they have the agency to change.

Ultimately, the mastery of domain-specific critique serves as the only reliable foundation for true interdisciplinary thinking. A student cannot meaningfully connect or critique two different fields of study without first understanding the distinct epistemic foundations of each. By learning to think deeply and differently within various specific contexts, students naturally begin to notice overarching patterns in how knowledge is constructed, defended, and revised. This self-reflective awareness eventually transcends the boundaries of any individual classroom, lecture hall, or training environment, creating an adaptable, independent mind capable of navigating a rapidly changing world.

Crucially, this contextualized paradigm yields immediate cognitive advantages by significantly improving knowledge retention and conceptual transfer. When analytical strategies are anchored directly to real-world subject matter, information transforms from abstract, short-term data into a deeply integrated schema. Students who learn to interrogate information within a domain do not merely memorize facts; they build robust mental models that tie specific concepts to their logical justifications and boundary conditions. This deep processing ensures that knowledge is stored in a highly accessible format, allowing students to effortlessly retrieve and apply their understanding to novel, unexpected problems within the field, rather than letting it fade immediately after an evaluation.

Additionally, embedding critical thinking cultivates a profound intellectual motivation and curiosity that isolated logic exercises fail to inspire. When students realize they have the agency to critique, debate, and reshape the foundational ideas of a discipline

they are actively studying, their relationship with education shifts from passive compliance to active stewardship. Rather than feeling alienated by sterile reasoning drills, they experience the authentic thrill of discovery, seeing how real scholars and professionals navigate competing theories. This sense of academic belonging and empowerment transforms the student from a distant observer into an engaged stakeholder, fostering a lifelong passion for continuous, self-directed learning.

8.1 Educator Prompts to Trigger Domain-Specific Critique

To successfully embed critical thinking within specific domains, educators must consciously shift their language away from prompts that merely trigger memory recall or passive description. Traditional phrasing often encourages students to treat knowledge as a static, pre-packaged commodity. By restructuring questions to target the unique epistemic rules, structural boundaries, and systemic biases of a given field, instructors force students to think like active practitioners within that discipline.

The following framework outlines how to rephrase common instructional prompts to trigger genuine, domain-specific critique across different areas of study:

Traditional Content Prompt	Reframed Domain-Specific Critique Prompt	Target Cognitive Skill
What is the correct answer or formula to solve this specific problem?	Under what parameter constraints or foundational assumptions does this model or formula fail to function accurately?	Identifying Boundary Constraints
What are the primary facts, dates, and causes of this specific historical event?	Whose perspective is missing or silenced in this archive, and how does that absence shape the dominant narrative?	Interrogating Archival Bias & Absences

What did the author mean by this specific metaphor or literary passage?	How does the structural ambiguity of this text allow for conflicting interpretations, and which ideological framework supports each view?	Navigating Structural Ambiguity
What were the final results and conclusions of this laboratory experiment?	What systemic vulnerabilities or confounding variables in this experimental design could challenge the validity of our conclusions?	Deconstructing Empirical Methodology
What is the standard professional procedure or checklist for this technical task?	If the standard procedure fails unexpectedly due to chaotic real-world variables, what diagnostic indicators will guide your adaptation?	Cultivating Situational Diagnostics
Which economic policy or organizational strategy did this institution implement?	Whose socioeconomic interests are privileged by this framework, and what are its hidden, long-term systemic costs?	Deconstructing Ideological Systems

By shifting the linguistic focus from *what* is known to *how* it is known and *where* its limits lie, educators dismantle the illusion of absolute certainty. These reframed questions force students to confront the cluttered, incomplete, and contested nature of real-world disciplines. When this style of interrogation becomes the default language of the classroom, students naturally develop the intellectual agility to evaluate claims, trace cognitive errors, and actively participate in the evolution of the field they are exploring.

8.2 Synthesizing the Embedded Paradigm

The transition from teaching critical thinking as an isolated subject to embedding it seamlessly within specific disciplinary domains represents a profound philosophical shift in pedagogical design. As this guide has argued, isolating analytical critique into an

independent silo fundamentally starves the mind of the domain-specific friction required for genuine intellectual growth. It creates a false dichotomy between the absorption of content and the practice of evaluation, inadvertently training students to become passive consumers of information who only occasionally activate their critical faculties. By integrating interrogation directly into the daily fabric of every field of study, educators close this artificial gap. The acquisition of knowledge is permanently fused with its evaluation, transforming every classroom, lecture hall, and laboratory into a living arena of disciplined skepticism and active inquiry.

The cognitive, professional, and ethical advantages of this integrated approach are both immediate and far-reaching. When students are forced to navigate the unique epistemic architecture, boundary constraints, and messy data of a specific field, they build robust, highly integrated mental models that dramatically improve long-term retention and conceptual transfer. Furthermore, reframing instructional dialogue from simple fact retrieval to deep epistemic interrogation shifts the student's role from passive compliance to active stewardship of the discipline. Graduates of this embedded model do not emerge merely with a checklist of generic logic skills; they possess the precise diagnostic tools, historical awareness, and moral clarity required to challenge naturalized paradigms, manage real-world ambiguities, and balance technical innovation with systemic responsibility.

Ultimately, the true measure of an education lies in its ability to cultivate genuine intellectual autonomy and lifelong metacognitive awareness. By mastering the art of critique within specialized, concrete contexts, learners naturally begin to recognize the broader, underlying patterns of how truth is constructed, defended, and revised across the human experience. By intentionally reframing our prompts, restructuring our curricula, and modeling explicit inquiry, we do not simply prepare students to pass an exam or fill a workforce vacancy; we cultivate adaptive, independent

minds capable of navigating, reshaping, and meaningfully contributing to a complex and rapidly changing world.

8.3 Re-Engineering the Educator Mindset

In order to prepare educators to cultivate a generation of independent, analytical minds, professional development must radically move away from generic teaching workshops that lecture on abstract logic or universal thinking skills. Traditional teacher training treats pedagogy as separate from content, failing because it reduces critical thinking to an isolated set of clean, artificial rules. Instead, training models must be deeply situated within the specific discipline the educator teaches, treating instructors not merely as classroom managers, but as active scholars of their own subject domains. By shifting the focus of professional development from generic instructional strategies to the deep interrogation of a field's unique epistemic rules, institutions empower educators to teach content as an ongoing, living argument rather than a static storehouse of facts to be memorized.

This transformative preparation requires guiding educators to systematically map the unique epistemic architecture and deep-seated blind spots of their own disciplines. Before an instructor can prompt students to think critically about a subject, they must first become deeply aware of how knowledge is constructed, validated, and contested within that specific arena. Training sessions must be structured as collaborative design laboratories where educators pull back the curtain on their curriculum's dominant frameworks, historical biases, and unstated assumptions. Through this deliberate process, teachers learn to identify the exact moments in their existing syllabi where certainty gives way to ambiguity, transforming standard learning objectives into prime opportunities for conceptual critique and student interrogation.

Furthermore, effective training must equip educators with the linguistic tools necessary to restructure daily classroom dialogue from the ground up. Professional development modules should explicitly focus on the art of dialectical questioning, moving

teachers away from traditional, recall-based phrasing that targets a single correct answer. Coaches should work with educators to audit their current assignments, exams, and lecture prompts, actively reframing them to target boundary constraints, conflicting evidence, and systemic implications. By practicing this reframing within peer groups, teachers build the linguistic agility required to move past simple fact retrieval, ensuring that their default classroom language naturally triggers deep, domain-specific analysis.

A critical, yet often overlooked, component of this preparation involves training educators to expertly navigate student discomfort and resistance. When a classroom shifts from passive memorization to continuous evaluation, students accustomed to looking for the comfort of a single correct answer frequently experience frustration and cognitive fatigue. Teacher training must provide concrete strategies for managing this transition, teaching educators how to scaffold ambiguity and validate the analytical process rather than just the final product. Instructors must learn to view student errors not as failures to be penalized, but as vital conceptual turning points that reveal underlying misconceptions. Training educators to normalize and celebrate this productive struggle ensures that the classroom remains a safe laboratory for intellectual risk-taking.

Compounding this challenge is the urgent necessity for the comprehensive retraining and continuous upskilling of the current in-service workforce. Many active, practicing educators were themselves educated under traditional, content-heavy systems that prioritized rote retention, meaning they may lack the immediate frameworks required to facilitate deep, open-ended domain critique. Institutional leadership cannot assume that a single introductory workshop is sufficient to undo decades of ingrained pedagogical habits. Instead, systems must invest in mandatory, recurring refresher courses and peer-coaching networks that allow current educators to continuously audit their practices, engage with shifting disciplinary methods, and actively unlearn the tendency to act as absolute gatekeepers of certainty.

Finally, training programs must reform how educators design and utilize assessment metrics. Critical thinking cannot thrive in a classroom where the evaluation system exclusively rewards rote replication and memorized compliance. Professional development must guide teachers to build robust, domain-specific rubrics that explicitly value and measure the quality of argumentation, the identification of bias, and the navigation of structural ambiguity. By aligning assessment practices directly with the philosophy of embedded critique, educators send a clear signal to learners that analytical reasoning is not an optional add-on, but the fundamental standard of academic excellence within that field. This comprehensive approach to teacher training ensures that critical thinking becomes a permanent, structural component of the educational ecosystem.

8.4 The Synthesis Arena

The ultimate validation of embedding critical thinking within specific subject domains lies in recognizing that the disposition to question, analyze, and evaluate is not merely a tool for academic specialization, but the foundational architecture of human agency. Competency-Based Education rightly demands that analytical skills be anchored to concrete tasks and distinct bodies of knowledge, preventing critical thinking from dissolving into an unapplied, abstract exercise. However, a student's intellectual journey does not end when they master the specific criteria of their chosen field. True critical thinking is a permanent, lifelong necessity that transcends any singular employment matrix or academic border. It serves as an internal compass required to navigate the hyper-complexities of civic life, evaluate shifting moral landscapes, detect misinformation, and make deliberate choices in an increasingly unpredictable world.

Because the ultimate destination of education is the cultivation of an adaptable, fully autonomous individual, this embedded disciplinary training must be intentionally unified through a dedicated university common unit. While domain-specific instruction builds the vital cognitive muscle and deep specialized

analytical frameworks, a standalone core course provides the rare, essential space for macro-level synthesis. Without this centralized arena, there is a distinct danger that a student's critical thinking abilities will remain fragmented, locked within the specific silos of their chosen professions. A core common unit explicitly rescues these scattered abilities, teaching students how to deliberately decouple critical thinking from its specialized constraints and translate it into a universal methodology for cross-disciplinary innovation and complex problem-solving.

This deliberate synergy between embedded instruction and a centralized university requirement transforms critical thinking from a localized academic requirement into a dynamic, lifelong cognitive asset. The common unit does not replace domain-specific critique; rather, it acts as an essential laboratory for higher-order metacognition, forcing students from diverse fields to pit their unique ways of processing reality against one another. It challenges future practitioners to discover the shared underlying values of intellectual humility, open-mindedness, and collaborative problem-solving. By maintaining a core common unit alongside integrated subject-matter training, higher education ensures that graduates possess both the highly specialized diagnostic capabilities required for immediate professional success and the universal, resilient critical thinking capacity necessary to navigate the human condition.

SECTION NINE

Assessment Methods for Competence-Based Education (CBE)

9.0 Introduction

To educate is not to fill a vessel, but to kindle a flame; yet, the machinery of modern evaluation often treats the human mind as little more than a warehouse for inherited data. In the landscape of traditional education, we have long conflated the echo of recitation with the resonance of true understanding. We reward the student who remembers the map, while neglecting the traveler who must navigate the unmapped terrain. Competence-Based Education (CBE) emerges as a quiet revolution against this static epistemic paradigm. It demands a shift from the passive possession of knowledge to the active, ethical manifestation of capacity. Within this framework, knowledge is no longer viewed as an end in itself, but as the raw material from which real-world agency is forged.

Within this landscape, critical thinking must be understood not as a standalone silo, nor as a mere byproduct of an isolated discipline, but as an *inter-subject ecosystem*. It operates as an intellectual connective tissue, a master meta-competence that breathes life into the spaces *between* traditional subjects. The modern world does not present its crises neatly partitioned into departments; a climate crisis is simultaneously an ecological, economic, and ethical dilemma. Critical thinking as an inter-subject domain is the fluid intelligence that allows a student to translate insights across these artificial borders - applying the empirical skepticism of the scientist to historical narratives, and the interpretive nuance of the humanist to statistical algorithms. It is the universal language of cognitive synthesis.

However, a profound philosophical paradox arises when we attempt to measure a capacity that inherently resists boundaries. How do we assess the invisible currents of human thought when they refuse to sit quietly within a single departmental bucket? If traditional assessment is a cage that traps the memorized fact, authentic assessment of an inter-subject domain must be an open horizon that invites multi-dimensional insight. We cannot measure a student's capacity to synthesize divergent perspectives or navigate structural ambiguity by offering them a rigid, multiple-choice menu of pre-packaged certainty. To truly evaluate this connective intelligence, faculty and senior school teachers must look beyond the parameters of their specific courses.

This requires us to establish a unified, integrative standard of evaluation. We must look to the cognitive actions that unite diverse fields of study: the parsing of systemic biases, the reconciliation of conflicting epistemologies, and the ethical defense of complex decisions. To bridge the gap between abstract integrative theory and concrete classroom practice, we must articulate explicit, operationalized *Cross-Disciplinary Assessment Criteria for CBE* that treat critical thinking as a dynamic, inter-subject bridge. Only by establishing these connective criteria can we build evaluation systems that honor the messy, iterative, and deeply reflective journey of the thinking mind, transforming assessment from an instrument of content compliance into a crucible of holistic intellectual growth.

9.1 Cross-Disciplinary Assessment Criteria for CBE

To assess Competence-Based Education (CBE) with critical thinking as its core engine, senior secondary school teachers and higher education faculty must replace static content checklists with dynamic, behavioral benchmarks. Because critical thinking acts as an inter-subject driver, these criteria explicitly evaluate the process of reasoning rather than the repetition of isolated facts. The first core criterion, *Epistemic Reconciliation*, measures a student's capacity to stand at the intersection of conflicting fields of study and forge a

coherent path forward. Learners are frequently confronted with data sets that speak entirely different professional languages - such as environmental metrics that flatly contradict short-term economic models. An advanced thinker does not simply choose one discipline and discard the other; instead, they evaluate the underlying assumptions of different subject areas, expose their systemic limitations, and synthesize a single, comprehensive framework that addresses the core problem.

The second vital criterion is *Analytical Translation*, which tracks a student's methodological agility in porting cognitive tools from a native discipline into foreign intellectual territory. This ensures that analytical methods are treated as portable instruments of universal reason rather than rigid rules tied to a single classroom. Faculty evaluate this agility by looking for evidence of meta-cognitive flexibility, such as the application of historical source criticism to scientific journalism, or the deployment of mathematical modeling to literary narrative patterns. The criteria explicitly reward the self-aware migration of these intellectual tools across traditional boundaries, verifying that the student can seamlessly reorganize diverse methodologies to unpack highly complex, cross-cutting problems.

Third, the framework prioritizes *Systemic Bias Deconstruction*, which measures how deeply a learner can peel back the layers of a claim to expose its hidden socio-cultural, economic, or institutional scaffolding. Biases are rarely confined to a single subject; they thrive in the blind spots where disciplines overlap, often cloaked in the authoritative language of a specific field. Assessment must therefore move beyond simple right-or-wrong matrices to evaluate the depth, nuance, and systemic awareness of the student's critique. An advanced student is expected to look beyond explicit, obvious biases within a single text and instead interrogate the historical and structural limitations of entire fields of study, revealing how foundational assumptions skew the interpretation of evidence.

Fourth, the engine of critical competence is sustained through *Metacognitive Auditing*, a criterion that grades the strategy of the

cognitive journey rather than just the final answer. This requires students to continuously monitor, evaluate, and restructure their own thought processes in real-time, documenting an explicit audit trail of their decision-making. By prioritizing intellectual humility when confronted with disruptive counter-evidence, this metric evaluates a student's willingness to ruthlessly critique their own initial hypotheses and actively seek out conflicting data to refine their logic. This shifting focus from product to process transforms the act of thinking into an observable sequence of self-regulated actions.

Fifth, to make these four abstract dimensions operational within an institutional setting, educators must employ *Behaviorally Anchored Metrics*. Traditional grading relies on vague, subjective adjectives like "excellent analysis" or "poor logic," which inevitably leads to grading variance across multi-teacher departments and distinct disciplines. By anchoring criteria to explicit, observable classroom behaviors, the rubric acts as a universal scale where an instructor can clearly track a student's transition from passive observation to active intellectual intervention. This behavioral grounding ensures that whether an artifact is an essay, a lab report, or an oral presentation, the underlying critical-thinking engine is evaluated with identical rigor and fairness.

Finally, integrating these comprehensive criteria reshapes the cultural landscape of the classroom, establishing a new contract of *Intellectual Accountability* between the learner and the educator. When critical competence is transparently mapped and measured, students realize that academic success is no longer a game of strategic compliance or clever memorization. They are pushed to view every assignment not as a box to be checked, but as a crucible for testing their own cognitive architecture against the chaotic, cross-disciplinary realities of the world. Ultimately, these criteria elevate CBE from a mere administrative framework into an equitable, profound training ground for human potential.

9.2 Universal Performance-Based Assessment Models

To translate abstract assessment criteria into the living reality of the classroom, educators must construct evaluation arenas that demand the active deployment of the critical-thinking engine. If the criteria of epistemic reconciliation and analytical translation are to be more than mere phrases on a syllabus, they require structural vessels capable of holding their weight. Traditional testing models - predicated on isolation, predictability, and the existence of a single pre-packaged answer are fundamentally unequipped for this task. They act as restrictive boundaries that stifle connective intelligence. Authentic performance-based assessment, by contrast, must deliberately disrupt these comfortable certainties, offering instead open-ended frameworks where students must actively navigate intellectual ambiguity.

The foundational blueprint for this disruptive evaluation is the *"Ill-Structured"* Problem. Unlike traditional textbook exercises that present clean variables and clear directions, an ill-structured problem mimics the beautiful, chaotic messiness of reality. It presents a scenario intentionally stripped of an obvious resolution, filled with missing information, conflicting data points, and competing stakeholder motivations. When high school teachers and university faculty introduce such a prompt, they are not testing whether a student can find a hidden answer key; rather, they are evaluating how the student begins to map the unknown. According to foundational framework guidelines from AACSB, well-designed assessments must bypass simple recall, forcing students to apply evidence-based reasoning and demonstrate deep accountability for the complex problems they solve.

A prime operational vehicle for this model is the *Multi-Perspective Case Study*, an assignment architecture that flatly rejects departmental isolation. Consider a scenario where students are tasked with designing a response to a looming regional water scarcity crisis. To succeed, a student cannot merely think like a hydrologist, an economist, or a moral philosopher; they must dynamically become all three. The assignment structure forces the

learner to actively engage in epistemic reconciliation, weighing the cold empirical data of climate models against the messy socio-political realities of local agricultural communities and the ethical imperatives of human rights. Research highlighted by Smowl (Online Exam Proctoring Software) reinforces that authentic, task-based configurations contribute significantly to improved knowledge transfer beyond classroom settings, proving far more effective than traditional standardized metrics.

Similarly, the *Structured Academic Controversy (SAC)* provides a powerful interactive model that puts metacognitive auditing to a rigorous, live test. In this performance model, students are placed in small groups and assigned opposing sides of a complex, cross-cutting issue - such as the ethical boundaries of gene editing in global public health. However, the true cognitive crucible occurs mid-way through the exercise, when the instructor forces the students to abandon their original positions, switch sides, and articulate their opponent's argument with absolute intellectual honesty. This deliberate destabilization aligns with the methodology noted by ResearchGate scholars, demonstrating that evaluating the structural strength of shifting arguments directly enhances a student's metacognitive awareness and analytical flexibility.

These performance models radically redefine the traditional understanding of a classroom "product". In a content-heavy educational paradigm, the final written essay, the polished report, or the completed worksheet stands as the ultimate evidence of learning. In a critical-thinking-driven CBE model, however, these final products are viewed with a healthy measure of skepticism, as they can frequently mask a lack of genuine understanding through eloquent mimicry or compliance. As argued by education specialists on *Scribd*, process assessments must carefully differentiate between merely completing an assignment and demonstrating active, higher-order cognitive skills throughout the journey. The true object of assessment becomes the visible trace of the student's

analytical struggle, rather than just the aesthetic polish of their final answer.

Consequently, implementing these models requires a profound shift in how faculty deliver and evaluate feedback. The instructor can no longer sit as a passive judge dispensing numerical points from a distance; they must become an active auditor of cognitive strategies. As established by Zabalza (2003), competency-based evaluation relies on a continuous loop of qualitative feedback designed to verify suitability through real, pertinent, and challenging tasks. Feedback within these performance-based models does not focus on correcting historical facts or fixing calculation errors, though structural accuracy remains important. Instead, the educator's commentary targets the logical handoffs between disparate ideas, probes the unstated assumptions underlying a student's chosen methodology, and challenges the systemic biases left unaddressed in their conclusions.

Moreover, these cross-disciplinary models act as an institutional bridge, breaking down the historic silos that have long isolated educators from one another. When senior secondary teachers and higher education faculty design assessments around ill-structured, multi-perspective problems, they are naturally driven to collaborate across departmental lines. A history professor and an environmental scientist find common ground in evaluating how a student handles conflicting historical records and ecological data within a single project. This institutional convergence, supported by the cross-cutting outcomes models outlined by *Learning Design experts*, ensures that transferable competencies like critical thinking are unpacked uniformly, offering students an integrated environment where universal analytical rigor is valued over localized departmental compliance.

Ultimately, universal performance-based assessment models serve as the vital proving grounds where students transition from passive consumers of knowledge to active architects of wisdom. By confronting problems that reflect the genuine friction of the world, learners discover that education is not an exercise in pleasing an

instructor or passing an exam. It is a live, ongoing workshop for cultivating the intellectual virtues necessary to navigate an unpredictable future. When we assess our students through these rigorous, multi-dimensional arenas, we ensure that their cognitive competence is not just a theoretical potential, but a practiced, resilient capacity ready to face the world.

9.3 Domain-Agnostic Process Assessments

While high-impact performance models provide expansive arenas for evaluating holistic synthesis, the critical-thinking engine must also be monitored at a more granular, immediate level. If we only evaluate the final, macro-level output of a student's labor, we risk missing the subtle fractures or triumphs that occur within their day-to-day cognitive processing. Domain-agnostic process assessments fill this vital pedagogical space, acting as precise instruments that capture thinking in its rawest, most immediate states. These finer formative tools peel back the polished exterior of completed assignments, allowing senior secondary school teachers and higher education faculty to observe, diagnose, and guide a student's intellectual mechanics as they unfold in real time. By shifting the evaluative gaze from what is produced to how it is processed, educators establish a continuous feedback loop that mirrors the non-linear nature of genuine intellectual inquiry.

The first of these precise tools is the *Cognitive Micro-Task*, a short, highly adaptable formative exercise that can be injected into any lecture, lab, or seminar across any discipline. Rather than checking for content recall, a cognitive micro-task isolates a specific intellectual behavior - such as source interrogation, flaw detection, or alternative hypothesis generation - and demands its immediate application. For instance, an instructor might display a single, flawed statistical claim or a historical passage containing a hidden logical contradiction, giving students five minutes to write a punchy critique identifying the structural vulnerability. Because these micro-tasks are intentionally stripped of heavy content constraints, they allow educators to isolate and measure the raw

speed, agility, and accuracy of a student's analytical engine without the distracting noise of a massive project framework.

Complementing these micro-tasks is the implementation of *Progressive Concept Mapping*, a visual assessment strategy that tracks how a student's mental models adapt when confronted with disruptive information. Critical competence is not a static state of knowing; it is the dynamic capacity to restructure one's thinking in light of new, often uncomfortable evidence. In this assessment model, students construct a visual map of a complex problem at the beginning of a unit, illustrating the causal links and relationships between variables. As the academic term progresses and the instructor deliberately introduces conflicting data points or rival frameworks, the student must physically redraw, expand, and recalibrate their map. Faculty grade not the static aesthetic beauty of the diagram, but the intellectual honesty, depth, and logic displayed in how those links are broken, rearranged, and forged anew.

To capture the deepest layers of self-regulation, educators must look to the *Reflective Audit Trail*, an assessment mechanism that shifts the focus of evaluation from the final product to the strategic choices made throughout its creation. When a student submits a major research paper, an engineering blueprint, or a business proposal, they are required to attach a continuous "log" or audit trail detailing their cognitive decisions. This trail documents the initial hypotheses they discarded, the sources they evaluated and rejected due to bias, and the exact moments where counter-evidence forced them to pivot their strategy. By evaluating this meta-cognitive diary alongside the final artifact, faculty can explicitly reward the intellectual virtues of humility and self-correction, penalizing superficial compliance while uplifting authentic, self-aware critical engagement.

The deployment of these micro-formative mechanisms fundamentally relies on a classroom culture that values "*Visible Thinking*." For an engine to be assessed, its internal gears must be exposed; similarly, for a teacher to audit a student's critical capacity,

the silent steps of logic must be translated into explicit, shared artifacts. Utilizing immediate response mechanisms, such as *rapid peer-interviews*, *interactive digital feedback dashboards*, or *live process-reflection challenges* - allows faculty to capture a comprehensive, real-time dataset of classroom comprehension. This live data stream enables pacing to be dictated by the depth of analytical mastery rather than the superficial speed of a few vocal students, turning the traditional lecture hall into a reactive laboratory of active reasoning.

Furthermore, these PDF-thin process assessments dramatically recalibrate the pedagogical approach to academic rigor. In traditional content-driven models, rigor was equated with the density of text a student could navigate or the volume of facts they could retain before a high-stakes examination. In a process-oriented CBE framework, rigor is redefined as the precision of one's analytical execution under changing conditions. When a faculty member tracks a student through multiple iterative cycles of micro-tasks and audit trails, they are testing the endurance of the student's logic, their ability to withstand cognitive dissonance, and their capacity to maintain strict standards of evidence under systemic pressure.

Ultimately, these fine-grained process assessments redefine the classroom relationship between failure and growth. In a traditional evaluation system, an analytical misstep on an exam results in a punitive reduction of points, discouraging intellectual risk-taking and incentivizing students to chase safe, predictable answers. Domain-agnostic process tools, however, treat cognitive errors not as permanent failures, but as highly instructive diagnostic data points that illuminate the boundaries of a student's current analytical capacity. By making the messy, iterative journey of the thinking mind completely visible, these formative mechanisms empower instructors to intervene precisely where a student's logic falters, ensuring that evaluation ceases to be a post-mortem judgment and becomes instead a supportive, continuous workshop for refining human reason.

9.4 Collaborative Critique and Co-Assessment

To fully realize critical thinking as an inter-subject driver within Competence-Based Education, the traditional architecture of authority in evaluation must be philosophically dismantled. For generations, the instructor has occupied an insulated position as the solitary arbiter of intellectual quality, while the student remained a passive recipient of a final, top-down verdict. This lopsided dynamic creates a severe pedagogical blind spot: it allows students to conform superficially to grading criteria without ever internalizing the underlying standards of rigorous judgment themselves. Authentic CBE demands that we transform evaluation into a shared, democratic ecosystem. By actively involving learners in the design and execution of assessment through collaborative critique, senior secondary school teachers and higher education faculty cultivate true student agency, transforming the classroom from an arena of compliance into a living workshop for distributed intellectual responsibility.

The foundational mechanism for this democratic shift is the *Student Co-Constructed Rubric*. When faculty present a completed, unyielding matrix on the first day of an assignment, they inadvertently distance the learner from the cognitive behaviors being measured. In a co-constructed framework, the class begins by analyzing varying exemplars of complex work, collectively debating and isolating the precise characteristics that separate superficial descriptions from high-level, systemic analysis. Through structured classroom dialogue, students and educators co-author the behavioral milestones for criteria like epistemic reconciliation or analytical translation. This act of co-creation demystifies advanced academic expectations, forcing students to look into the cognitive mechanics of evaluation and encouraging them to view a rubric not as an arbitrary hurdle to bypass, but as a transparent map of their own intellectual development.

Once the evaluative framework is co-established, it must be put to the test through a multi-tiered system of Peer Moderation. True critical thinking requires an evaluative mindset that can be directed

inward toward one's own work or outward toward the claims of others. Peer review, however, must carefully move past the shallow boundaries of casual proofreading or unstructured commentary; it must be structured as a formal, rigorous process of evaluative judgment. Faculty can introduce multi-tiered moderation activities, including pre-moderation calibration exercises, where students practice grading sample anonymous portfolios, and perimoderation loops, where peer feedback is delivered formatively without initial point penalties. This systematic exposure to peer critique sharpens a student's evaluative lens, teaching them to look past personal biases and focus entirely on the structural strength, evidence quality, and logical continuity of an argument.

Furthermore, establishing this collaborative architecture requires careful attention to the social and psychological dynamics of the classroom. Research indicates that while students often feel empowered by the rubric co-design phase, they can experience cognitive discomfort and relational anxiety when tasked with evaluating or being evaluated by their peers. To mitigate these interpersonal frictions, educators must explicitly scaffold the peer-review process, shifting focus away from "peer assessment" (awarding grades) and prioritizing "peer review" (offering qualitative diagnostic feedback). By utilizing structured feedback routines - such as blind digital review channels to preserve anonymity or targeted criteria checklists, instructors can build a psychologically safe environment where critical critique is decoupled from personal exposure.

Beyond individual skill-building, this co-assessment approach establishes a community of practice that mirrors contemporary scholarly and professional environments. When students engage in structured moderation panels or interactive calibration circles, they actively simulate the peer-review mechanisms of academic journals and corporate advisory boards. This dynamic demands that students justify their evaluative stances with explicit reference to the co-constructed behavioral definitions, effectively removing arbitrary emotion or personal rivalry from the equation. Through

this continuous practice of collective defense and collective audit, individual student efforts are unified under a shared culture of intellectual excellence, demonstrating that analytical rigor is a collective standard rather than an isolated pursuit.

Ultimately, embedding collaborative critique and co-assessment at the center of CBE is an act of democratic empowerment. When senior school students and university undergraduates learn to negotiate success criteria, calibrate their judgments against external evidence, and defend their analytical critiques to their peers, they are practicing the essential civic virtues of a free society. They discover that knowledge and standards of truth are not static monuments handed down by an elite authority, but living, rigorous agreements built through collaborative inquiry and relentless self-correction. By stepping into the dual roles of both creator and auditor, the learner breaks free from the dependency of the traditional classroom, stepping fully into their own authority as a self-regulated, deeply critical thinker ready to navigate a fractured world.

9.5 Scalability, Bias, and the AI Challenge

The systemic implementation of a critical-thinking-driven Competence-Based Education framework inevitably collides with the harsh realities of institutional logistics. While thin, binary testing instruments like multiple-choice grids scale seamlessly across massive student bodies, the nuanced evaluation of process-oriented intellect requires significant temporal and cognitive resources from faculty. When a department scales from twenty students to several hundred, the deep reading of reflective audit trails and the observation of live performance models can quickly induce evaluator fatigue, introducing structural bottlenecks into the educational pipeline. This logistically constrained landscape creates a strong administrative temptation to retreat into traditional, superficial assessment models, sacrificing the authentic evaluation of higher-order reasoning for the sake of mechanical convenience and rapid grading turnaround.

Compounding this structural friction is the persistent vulnerability of human evaluation to systemic grading bias. Because critical thinking is manifested through open-ended, complex problem-solving rather than standardized answer keys, the evaluation process risks becoming an involuntary theater for an instructor's implicit prejudices. Factors ranging from a student's prior academic reputation to subtle variations in writing style or socio-cultural rhetoric can quietly warp an assessor's judgment, clouding their evaluation of a student's underlying reasoning strength. To scale CBE without compromising equity, institutions must deploy *Behaviorally Anchored Rating Scales (BARS)* that anchor marks to explicit, observable behavioral milestones rather than vague qualitative descriptors. Standardizing evaluation around these objective scales forces multi-teacher departments to operate under a single calibrated standard, minimizing individual grading variance and shielding the student from subjective prejudice.

The contemporary challenge of this scalable, unbiased evaluation has been fundamentally altered by the rapid rise of sophisticated generative artificial intelligence tools. In an educational landscape where large language models can seamlessly generate polished essays, clear code, and structurally sound reports in seconds, traditional homework artifacts can no longer serve as reliable evidence of an individual's critical capacity. As emphasized by contemporary educational researchers, when submitted work reflects machine generation rather than human capacity, the entire inferential chain from performance to qualification is invalidated. If an instructor continues to grade only the final written product, they trigger what experts call an *"assessment validity gap"* - failing to evaluate the student's internal cognitive engine and instead measuring the surface quality of a prompt engine.

Rather than attempting to ban these pervasive tools through unenforceable plagiarism policies, progressive faculty must intentionally redesign their assessments to be inherently AI-resilient. This resilience is achieved not by building tools impervious to automation, but by designing tasks so that artificial

assistance cannot completely substitute for the cognitive struggle essential to genuine learning. Rather than policing students, institutions must shift academic labour towards pedagogical designs that place a premium on conceptual understanding, interpretation, and real-time judgment. This principle requires a systematic shift in primary grading weights away from static, final submissions and a purposeful redirection toward the live, non-linear phases of the learning journey.

To execute this process-oriented shift at scale, faculty can strategically *introduce voice-driven, interactive components* where an algorithmic model cannot act as an immediate proxy for a student's live agility. Implementing live oral vivas, unexpected process interventions, or real-time structured academic controversies forces students to re-enter and defend their own reasoning on command. Furthermore, as demonstrated by digital learning design initiatives, these interactive sessions can be supported by branching, scenario-based digital simulations that track a student's situational decision-making trail in real time. These process-heavy configurations allow educators to monitor and grade a student's live cognitive agility and professional judgment without relying on traditional take-home essays.

In tandem with live performances, generative AI can be intentionally leveraged as an analytical foil to deepen, rather than diminish, a student's critical engagement. Instructors can craft assignments where the primary task is not to write a report, but to ruthlessly critique a highly detailed, deeply flawed analysis pre-generated by an AI model. When AI use is made visible and analytical, it becomes a learning activity rather than a shortcut, prompting students to develop the critical AI literacy that will serve them professionally. Under this design, the rubric scores the student's capacity for systemic bias deconstruction, error auditing, and epistemic reconciliation as they dissect the machine's hallucinations and hidden logical gaps.

Ultimately, navigating the overlapping challenges of scalability, grading bias, and automated intelligence requires an institutional

commitment to rewriting the educational contract. Senior school teachers and higher education faculty must accept that the comfortable, predictable methods of past evaluation systems are poorly suited for an unpredictable, technologically fluid world. By embracing process-focused, AI-resilient assessment models grounded in transparent behavioral criteria, institutions can build a scalable framework that honors the authentic development of the human mind. In doing so, education moves beyond an administrative ritual of credentialing and becomes a resilient training ground for cultivating the sharp, independent intellects needed to navigate the complex realities of the future.

9.6 Synthesizing Assessment for the Future Mind

To reimagine assessment within Competence-Based Education is ultimately to engage in an act of profound restoration, rescuing the human intellect from the reductionist machinery of standardized compliance. Throughout this section, we have argued that if critical thinking is to be the true engine of modern education, our methods of evaluation must match the fluid, interconnected nature of human reason itself. We cannot prepare senior secondary students and university undergraduates for a world defined by systemic volatility if our exams remain anchored to static certainty. By establishing explicit, cross-disciplinary criteria, such as epistemic reconciliation and metacognitive auditing, and embedding them within universal performance models, educators can move beyond the surface-level tracking of data retention. We begin instead to evaluate the deep, living capacity of a mind learning to navigate the unknown.

This transformative shift demands a collective willingness among faculty and teachers to sit with the inherent messiness of process-oriented learning. It requires us to look past the polished aesthetic of the final written product and instead value the visible trace of the student's internal cognitive struggle. Whether through the real-time friction of an ill-structured case study, the strategic iterations of a progressive concept map, or the collective accountability of a co-constructed rubric, authentic assessment must always serve as

an invitation to think rather than a trap for failing to remember. Furthermore, as we navigate the complex, overlapping challenges of scalability, grading bias, and the rapid ascent of generative artificial intelligence, our commitment to process over product becomes our most vital line of defense. It ensures that education remains a deeply human encounter, an un-automatable crucible where lived wisdom is actively forged.

Ultimately, the ultimate test of any assessment framework is not how cleanly its data can be aggregated into an institutional spreadsheet, but how effectively it empowers the learner to step into their own cognitive authority. When senior school teachers and higher education faculty cultivate an evaluative ecosystem grounded in transparent, behaviorally anchored criteria, they do more than simply certify professional competence. They nurture the essential civic virtues of intellectual humility, analytical courage, and systemic responsibility. In a fractured world flooded with automated information and competing claims to truth, the sharp, independent thinker is no longer an academic luxury, they are a democratic necessity. By aligning our assessment practices with this high calling, we ensure that our classrooms cease to be monuments to past knowledge and become, instead, resilient workshops for the future of human intelligence.

9.7 CBE Subject-Specific Assessment Criteria

Competence-Based Education (CBE) shifts the academic focus from traditional time-based learning to the actual mastery of specific skills and measurable behaviors (Wongnaa and Boachie, 2018). Unlike traditional frameworks that rely heavily on memorization and standardized testing, CBE requires dynamic evaluation strategies that can accurately measure what a student can do rather than just what they know (Ministry of Education, 2021). To achieve this, assessment methods must be inherently performance-driven, continuous, and highly integrated into the learning process (Evans et al., 2021). These methods provide concrete evidence of proficiency while giving learners multiple opportunities to

demonstrate their capabilities at their own pace. They include the following:

1. Performance-Based Assessments

Performance-based assessments serve as the cornerstone of CBE by requiring students to apply their knowledge to execute complex, real-world tasks (Wongnaa and Boachie, 2018). Instead of selecting answers from a multiple-choice list, learners are asked to build projects, conduct laboratory experiments, or deliver professional presentations (Kenya National Examinations Council, 2021). Educators evaluate these tasks using pre-defined criteria that explicitly outline what successful mastery looks like (Alkhaledi et al., 2024). This approach ensures that evaluation directly mirrors the actual environments where the competencies will eventually be utilized.

- *Senior School Example:* In a **Senior School Agriculture** pathway, rather than taking a written exam on crop production, students are assessed on their physical ability to prepare a nursery bed, test soil pH, and safely apply organic fertilizers to achieve optimal crop germination.
- *Critical Thinking Demonstration:* Critical thinking is exemplified here through **problem-solving and troubleshooting**. If the tested soil pH is found to be too acidic for the target crop, the student cannot simply follow a rigid script; they must analyze the variance, calculate the exact amount of agricultural lime needed to neutralize the soil, and adjust their environmental strategy based on real-time data.

2. Objective Structured Clinical Examinations (OSCEs) and Simulations

In fields where practical execution is critical, such as healthcare, aviation, and engineering, simulated environments

offer a safe yet rigorous method for checking competence (Kishan Prasad HL et al., 2020). Objective Structured Clinical Examinations (OSCEs) and high-fidelity simulations place students in highly realistic scenarios where they must diagnose problems, interact with clients, or troubleshoot equipment under pressure (Assessment of clinical competence, 2020). Assessors use standardized checklists to evaluate technical precision, decision-making speed, and interpersonal skills, bridging the gap between theoretical training and professional reality (Wolcott MD et al., 2018).

- *Tertiary College Example:* In a **Medical Training College (KMTC) Diploma Program**, a nursing student moves through a series of timed OSCE stations where they must interact with a patient mannequin or actor experiencing acute respiratory distress. They are graded on their ability to properly administer oxygen, check vital signs, and maintain professional bedside manners under strict time constraints.
- *Critical Thinking Demonstration:* Critical thinking is exemplified through **clinical reasoning and rapid prioritization under pressure**. The student must interpret ambiguous, fluctuating vital signs, rule out competing diagnoses (such as an asthma attack versus acute heart failure), and make an immediate, justified decision on the safest intervention before the patient's condition deteriorates.

3. Portfolio Assessment and Authentic Evidence

Portfolios offer a longitudinal view of student growth by compiling a curated collection of a learner's work over an extended period (Assessment of clinical competence, 2020). Students populate their portfolios with authentic evidence of their competencies, such as written reports, code repositories, video recordings of performances, and

reflections on their learning journey (Tanzania Institute of Education, 2013). This method shifts the ownership of assessment to the student, encouraging metacognition and self-evaluation while allowing instructors to verify that a competency has been sustained across different contexts (Harrison CJ, 2016).

- *University Level Example:* In a **University Software Engineering Degree**, a final-year student compiles a digital portfolio on GitHub (a cloud-based platform where developers store, share, and manage their computer code). This repository contains full-stack web applications they have built, documented APIs, code review feedback they provided to peers, and video demonstrations of their software successfully running in real-time.
- *Critical Thinking Demonstration:* Critical thinking is exemplified through **synthesis, curation, and defense of intellectual choices**. Rather than just dumping files into a folder, the student must evaluate their own body of work, select the pieces that best demonstrate optimized system architecture, and write technical justifications explaining *why* they chose specific coding frameworks over others to solve scalability issues.

4. Direct Observation and Workplace-Based Assessment

Direct observation in authentic workplaces such as internships, clinical rotations, or apprenticeships provides the most direct evidence of occupational readiness (Assessment of clinical competence, 2020). Supervisors and educators utilize structured tools like Entrustable Professional Activities (EPAs) or mini-Clinical Evaluation Exercises (mini-CEX) to evaluate learners as they perform routine professional tasks (Cate and Schumacher, 2022). This continuous, real-time assessment captures crucial nuanced behaviors, including professional ethics,

teamwork, adaptability, and situational awareness, which are difficult to replicate in a traditional classroom setting.

- *University Level Example:* In a **University Bachelor of Education Program**, a faculty supervisor and an assigned school mentor sit in a live classroom to observe a student-teacher during their teaching practice. They utilize a structured rubric to evaluate real-time classroom management, lesson delivery, and how the student-teacher engages struggling learners.
- *Critical Thinking Demonstration:* Critical thinking is exemplified through **situational awareness and dynamic adaptation**. When a pre-planned lesson plan completely fails to engage the learners or a disruptive behavioral incident occurs, the student-teacher must read the room, abandon their rigid script, and critically pivot their pedagogical strategy mid-lesson to re-establish a productive learning environment.

5. Formative Diagnostic Feedback and Micro-Credentials

Continuous formative assessment is vital in CBE to guide learners toward mastery before they attempt high-stakes summative evaluations (Lim YS, 2019). Frequent low-stakes quizzes, interactive digital modules, and peer-review sessions offer immediate diagnostic feedback that highlights specific skill gaps (Kenya National Examinations Council, 2021). As students successfully demonstrate individual sub-skills or smaller competencies, they are often awarded digital badges or micro-credentials, which serve as motivational milestones and verifiable proof of specialized capabilities (Benen, 2021).

- *Tertiary College Example:* In a **Technical and Vocational Education and Training (TVET) College**, automotive engineering students complete short digital modules on modern vehicle electronics. Once a student demonstrates they can accurately use an

OBD-II scanner to diagnose an engine fault code, they instantly earn a "Digital Vehicle Diagnostics" micro-credential badge.

- *Critical Thinking Demonstration:* Critical thinking is exemplified through **diagnostic deduction and iterative trial-and-error**. An error code on a scanner rarely points to a single faulty part; the student must critically trace electrical schematics, isolate variables, formulate hypotheses about why a circuit is failing, and use logical deduction to pinpoint the exact root cause of the mechanical failure.

6. Criterion-Referenced Rubrics

To ensure fairness, transparency, and consistency, CBE relies strictly on criterion-referenced rubrics rather than norm-referenced grading curves (Kenya National Examinations Council, 2021). These rubrics break down complex competencies into distinct, observable behaviors and define explicit performance levels ranging from "emerging" to "mastery" (Implementing Competency-Based Education, 2025). Because the grading standard is absolute and public, students know exactly what is required to pass, eliminating competition among peers and ensuring that every passing grade signifies a guaranteed level of ability.

- *Tertiary College Example:* In a **Culinary Arts Certificate Course**, students are graded on a knife-skills assessment using an absolute rubric. To achieve "mastery," the student's *julienne* (to cut vegetables, fruits, or cheese into long, thin strips that look like matchsticks) cuts must be exactly 1/8 inch by 1/8 inch by 2 inches, regardless of how fast or slow the rest of the class finishes the task.
- *Critical Thinking Demonstration:* Critical thinking is exemplified through **adherence to quality standards**

and self-regulation. Because the rubric clearly defines "mastery" vs "emerging," the student must continually critique their own work-in-progress against the absolute benchmark, analyze their physical technique (e.g., blade angle, hand grip), and make micro-adjustments to self-correct their performance to meet the standard.

7. Self-Assessment and Reflective Journals

Developing self-directed learners is a core objective of CBE, making self-assessment and reflective writing highly valuable diagnostic tools (Lim YS, 2019). By regularly analyzing their own performance against established competency rubrics, students learn to identify their strengths and proactively target their weaknesses (Implementing Competency-Based Education, 2025). Reflective journals prompt learners to articulate how they solved a problem or navigated a failure, transforming a mechanical task into a deeply understood, internal competence that can be adapted to future challenges.

- *Senior School Example:* In a **Senior School Performing Arts** track, after delivering a mock theatrical performance or presentation that did not go as planned, a student writes a journal entry analyzing exactly where their vocal projection and emotional delivery faltered, mapping out a specific rehearsal plan to correct it before the final evaluation.
- *Critical Thinking Demonstration:* Critical thinking is exemplified through **deep metacognition and objective self-appraisal**. The student must step outside of their emotional reaction to a sub-optimal performance, objectively deconstruct their behavioral flaws, evaluate the cause-and-effect relationship of their preparation habits, and design a logical, forward-

looking strategy for cognitive and behavioral improvement.

Overall, critical thinking serves as the operational engine of Competence-Based Education (CBE), transforming abstract cognitive theory into observable, real-world behaviors. Across these seven assessment methods, learners are consistently pulled away from passive recall and forced to engage in high-level intellectual processes: they must execute data-driven problem solving in performance tasks, practice rapid clinical reasoning during high-stakes simulations, and engage in synthesis and justification when curating personal portfolios. Furthermore, whether adapting pedagogical strategies mid-lesson during direct observations, utilizing inductive reasoning to isolate mechanical faults for micro-credentials, or exercising metacognitive self-regulation against strict criterion-referenced rubrics and journals, students actively drive their own learning. Ultimately, these dynamic evaluation strategies ensure that a student's graduation from senior school, college, or university signifies not just a collection of credit hours, but a proven, highly adaptable capacity to reason logically and solve volatile, real-world problems.

Appendices

Appendix 1: Sample Course Outline for First Year Sociology University Students tailored on Scaffolded Metacognition Framework

Course Outline

Unit Code & Name: ASD100: Introduction to Sociology

A. Course Outline: Introduction to Sociology

Framework: Scaffolded Metacognition (Planning → Monitoring → Regulating → Evaluating)

Phase 1: Planning & Mapping (Weeks 1–3)

Instructor support is high. Focus is on identifying prior knowledge, biases, and setting learning goals.

Week 1: The Sociological Imagination

- ✓ **Sociological Core:** Distinguishing "personal troubles" from "public issues" (C. Wright Mills).
- ✓ **Metacognitive Task: Pre-Course Belief Inventory.** Students write down their current explanations for why poverty exists.
- ✓ **Journal Prompt:** *Look at your explanation for poverty. Is your view primarily individualistic or structural? What personal experiences shaped this viewpoint?*

Week 2: Culture and Social Norms

- ✓ **Sociological Core:** Cultural relativism, ethnocentrism, and folkways vs. mores.
- ✓ **Metacognitive Task: Assumptions Mapping.** Students identify an everyday norm they take for granted.

- ✓ **Journal Prompt:** *How did you learn this specific norm? Anticipate how a person from a different culture might perceive your daily routine, and map out where your own cultural biases might cloud your objectivity.*

Week 3: Socialization and the Self

- ✓ **Sociological Core:** Agents of socialization (family, peers, media) and Cooley's "Looking-Glass Self."
- ✓ **Metacognitive Task: Reading Plan Log.** Before reading the text, students skim headers and predict the most challenging concept.
- ✓ **Journal Prompt:** *Which concept did you predict would be hardest? Describe the exact study strategy (e.g., flashcards, summarizing, active recall) you planned to use, and whether it actually helped you understand the concept.*

Phase 2: Monitoring & Tracking (Weeks 4–6) - Lecturer support moderates. *Focus shifts to tracking emotional friction, cognitive dissonance, and comprehension gaps.*

Week 4: Social Class and Stratification

- ✓ **Sociological Core:** Socioeconomic status, social mobility, and systemic class barriers.
- ✓ **Metacognitive Task: Cognitive Dissonance Tracker.** Students note physical or mental resistance during class data presentation.
- ✓ **Journal Prompt:** *When we reviewed statistics on low social mobility, did you feel defensive, surprised, or dismissive? Trace that emotional reaction to a specific belief you track in yourself.*

Week 5: Race and Ethnicity

- ✓ **Sociological Core:** Institutional racism, prejudice, privilege, and intersectionality.

- ✓ **Metacognitive Task: The Muddiest Point.** Identifying precise moments of confusion during dense systemic theories.
- ✓ **Journal Prompt:** *What was the most confusing or uncomfortable sentence in this week's reading? Break down exactly where your understanding broke down: Was it vocabulary, logic, or a conflict with your lived experience?*

Week 6: Gender and Sexuality

- ✓ **Sociological Core:** The social construction of gender, gender roles, and wage gaps.
- ✓ **Metacognitive Task: Peer Strategy Swap.** Mid-term check-in on peer study methods.
- ✓ **Journal Prompt:** *Compare your notes on gender construction with a peer. What did they notice that you missed? How will you alter your note-taking strategy next week based on their method?*

Phase 3: Regulating & Adjusting (Weeks 7–9) - Lecturer support lowers. Learners actively adjust their learning strategies and analytical lenses based on performance feedback.

Week 7: Social Institutions – Education

- ✓ **Sociological Core:** Manifest and latent functions of schooling; tracking and educational inequality.
- ✓ **Metacognitive Task: Midterm Feedback Self-Correction.** Reviewing mid-term errors.
- ✓ **Journal Prompt:** *Analyze the feedback on your midterm assessment. Identify one recurring logical flaw or gap in your understanding. Write a concrete three-step plan to fix this error in your next analytical essay.*

Week 8: Social Institutions – Family and Religion

- ✓ **Sociological Core:** Changing definitions of family structures; secularization and religious functions.

- ✓ **Metacognitive Task: Framework Switching.** Analyzing a single topic through competing theories (Functionalism vs. Conflict Theory).
- ✓ **Journal Prompt:** *I wrote my initial thoughts on family using functionalism. When I forced myself to switch to conflict theory, how did my conclusions change? Which framework felt more natural to me, and why does my mind default to it?*

Week 9: Deviance and Social Control

- ✓ **Sociological Core:** Stigma, labeling theory, and the criminal justice system.
- ✓ **Metacognitive Task: Concept Mapping Assessment.** Creating an independent visual web of deviance theories.
- ✓ **Journal Prompt:** *Explain the logic behind how you structured your concept map. Why did you connect labeling theory to your specific examples? What structural gaps did you notice in your own map while drawing it?*

Phase 4: Evaluating & Synthesizing (Weeks 10–12) - *Autonomous student regulation. Focus is on evaluating overall cognitive growth and shifts in the sociological worldview.*

Week 10: Social Movements and Collective Action

- ✓ **Sociological Core:** Civil rights, environmental movements, and resource mobilization theory.
- ✓ **Metacognitive Task: Theory Evaluation.** Grading the utility of sociological frameworks.
- ✓ **Journal Prompt:** *Evaluate the theories of social movements presented this week. Which framework best explains a current event you see in the news today? Why did you select this framework over the others?*

Week 11: Globalization and Social Change

- ✓ **Sociological Core:** Modernization, world-systems theory, and digital societies.

- ✓ **Metacognitive Task: Bias Evolution Analysis.**
Comparing past and present mindsets.
- ✓ **Journal Prompt:** *Read your Week 1 entry on poverty. How has your framework for evaluating global inequality changed? What specific evidence or concept from this semester forced you to alter your initial thinking?*

Week 12: Final Synthesizing & Course Portfolio

- ✓ **Sociological Core:** The future of society and applying sociology outside the classroom.
- ✓ **Metacognitive Task: Final Metacognitive Synthesis.**
- ✓ **Journal Prompt:** *Reflect on yourself as a learner over the last 12 weeks. What is the most significant change in how you process complex social data? How will you apply this style of self-monitoring to future non-sociology courses?*

B. Grading Rubric for Metacognitive Journals

This 20-point rubric evaluates the **depth of thinking, strategy adjustment, and self-awareness**, rather than whether the student got a sociological answer "right" or "wrong."

Criteria	Advanced (5 pts)	Proficient (4 pts)	Developing (2-3 pts)	Novice (0-1 pt)
Depth of Self-Reflection	Deeply analyzes personal assumptions, emotional triggers, or cognitive biases. Explores <i>why</i> they	Identifies assumptions and biases clearly, but does not fully trace their origins or deeper structural causes	Mentions personal thoughts superficially. Explains <i>what</i> they think, but lacks self-analysis or exploration of biases.	Merely recites course facts or summaries. Completely avoids personal reflection or self-analysis.

Application of Framework	Seamlessly connects a specific metacognitive phase (Planning, Monitoring, Regulating, or Evaluating) to a sociological concept.	Applies the week's metacognitive task clearly, though the connection to the sociological concept is slightly disjointed.	Attempts the metacognitive task, but confuses the phases (e.g., tries to evaluate before planning or monitoring)	Fails to complete the assigned metacognitive task. Writes a standard essay rather than a reflective journal.
Strategy & Regulation	Identifies specific learning blocks, evaluates study tactics used, and proposes concrete, realistic changes to their learning process.	Recognizes learning difficulties and mentions general strategies for improvement, but the solutions are somewhat vague.	Acknowledges a learning struggle or confusion, but expresses helplessness or offers no plan to resolve it.	Does not monitor understanding. Fails to note any areas of confusion or strategies for learning improvement
Evidence of Intellectual Growth	Clearly contrasts previous worldviews or study habits with current states. Explicitly embraces cognitive discomfort.	Acknowledges that their thinking has evolved or changed, but provides limited evidence or examples of that growth.	Mentions that the course is interesting or eye-opening, but demonstrates no actual change in cognitive habits or assumptions.	Rigidly holds onto initial assumptions. Shows resistance to self-examination or growth over time.

C. Student Guide on Writing Metacognitive Journals

a) Overview

Welcome to your sociological journey! In this course, you will not just memorize sociological facts. You will learn to map, track, and evaluate **how you think** about the social world.

To do this, you will keep a **Metacognitive Journal** throughout the 12-week semester. "Metacognition" simply means *thinking about your own thinking*. These journals are designed to help you notice your own assumptions, recognize when your brain experiences confusion or discomfort, and adjust your study habits to master complex topics.

b) The Four Phases of Your Journal

Your prompts change throughout the semester as your skills grow. You will move through four specific phases:

-  **Phase 1: Planning (Weeks 1–3):** Before you read or study, you will map out what you already know, identify personal biases, and choose your learning strategies.
-  **Phase 2: Monitoring (Weeks 4–6):** While learning, you will pause to track your internal friction, emotional reactions, and areas of confusion.
-  **Phase 3: Regulating (Weeks 7–9):** After receiving feedback, you will change your analytical lenses and actively alter your study strategies to fix systematic errors.
-  **Phase 4: Evaluating (Weeks 10–12):** At the end of the course, you will measure your overall cognitive growth and look at how your view of society has evolved.

c) Formatting & Requirements

- ✚ **Length:** 300 to 450 words per weekly entry.
- ✚ **Structure:** Every journal entry must include three distinct paragraphs using the **A-M-O Framework**:
 - i. **A – Assess:** Address the specific weekly prompt by exploring your internal thought process, bias, or strategy.
 - ii. **M – Monitor:** Connect this thought process directly to a specific sociological concept or reading from the week.
 - iii. **Optimize:** State exactly how you will change, tweak, or apply your thinking or learning strategy moving forward.
 - iv. **Tone:** Reflective, honest, and analytical. Use first-person language ("I noticed," "My assumption was," "I struggled to grasp").

What This Journal Is NOT

- ✚ **It is NOT a summary:** Do not repeat what the textbook says. Your instructor already knows the sociology definitions. We want to know how *your* brain processed them.
- ✚ **It is NOT an essay:** You do not need a formal thesis statement, perfect academic jargon, or outside research.
- ✚ **It is NOT about being "right":** You will never be penalized for admitting that a concept confused you, or that your initial assumption was biased. Honesty and strategy adjustment earn top marks.

d) Example: Proficient vs. Weak Entry

Weak Entry (Summary Style)

"This week we read about Cooley's Looking-Glass Self. This theory says that our self-concept is built on how we think other people see us. I think this is a very interesting concept because social

media makes everyone care about their image. I see this happening a lot with my friends on Instagram."

- **Why it fails:** This is a summary followed by a generic opinion. The student does not analyze their own thinking, track a learning strategy, or explain how they processed the material.

Strong Entry (Metacognitive Style)

"[ASSESS] - Before opening the reading on the Looking-Glass Self, I planned to skim the text quickly because I assumed 'the self' was just common sense. However, when I got to Cooley's three steps, I realized my strategy failed. I caught myself zoning out because the concept of seeing myself through an imagined lens felt abstract and uncomfortable.

"[MONITOR] - To fix this breakdown in my comprehension, I changed my strategy. I stopped reading and drew a diagram mapping out how I personally internalize comments from my family versus my peers. This helped me realize that my sense of professional confidence is entirely built on what I assume my professor thinks of me, which perfectly illustrates Cooley's concept.

"[OPTIMIZE] - Going forward, I realize that my habit of passive reading does not work for abstract sociological theories. For next week's reading on social class, I will start by building a concept map while I read, rather than trying to cram the text into my head all at once."

- **Why it succeeds:** The student identifies a failed learning strategy, pins down their exact moment of cognitive resistance, applies the sociology framework directly to their own behavior, and builds a concrete plan to optimize their learning for the next week.

Appendix 2: Sample Lesson Plan Structure for First Year University Students tailored on Paul Elder Framework

Unit Code & Name: IRD 100: Introduction to International Relations

Topic: Terrorism

Note: At the introductory university level, the primary challenge is moving students away from treating terrorism purely as an emotional, moral, or psychological aberration. This lesson uses the **Paul-Elder Framework** to move freshmen to domains of analyzing terrorism as a calculated, strategic choice within the international system, examining it through competing IR frameworks like Rational Actor Models (Strategic Realism) and Critical/Constructivist Security Studies.

Topic Theme/Lesson Plan: Terrorism and Non-State Actors: Asymmetric Warfare, and the Framing of Terrorism

Duration: 50 - 60 minutes

1. Objectives (IR/Terrorism Studies Intellectual Traits)

- *Academic Goal:* Students will distinguish between the *rhetorical/ideological justifications* a terrorist group uses and the underlying *strategic, asymmetric goals* dictated by their position in the global power hierarchy.
- *Critical Thinking Goal:* Students will build **Intellectual Empathy** and **Fair-mindedness** by analyzing a terrorist group's actions through a clinical, rational-choice lens, evaluating how a non-state actor exploits structural vulnerabilities to achieve specific political outcomes.

2. Focal Elements of Thought

- *Purpose:* The ultimate political or structural objective of the non-state actor (e.g., regime change, territorial liberation, provoking state overreaction).
- *Implications & Consequences:* The predictable cyclical feedback loops of counter-terrorism policies (e.g., how state retaliation can inadvertently fuel terrorist recruitment).

3. Focal Intellectual Standards

- *Precision:* Stripping away broad, politically charged labels (like "evil" or "mindless violence") to isolate the precise tactical logic of asymmetric warfare.
- *Depth:* Digging past the surface-level religious or ideological rhetoric to map out the underlying structural grievances (e.g., state fragility, foreign occupation, economic disenfranchisement).

4. Lesson Sequence

Phase 1: The "Senseless Violence" Trap (15 Minutes)

- *Activity:* Display a short statement or a manifesto excerpt from a historical or contemporary transnational terrorist group, alongside a standard state response condemning the act as "mindless, irrational terror."
- *The Trap:* Ask the class: *Is terrorist violence fundamentally irrational?* Freshmen will typically default to moral outrage or psychological explanations: *"Yes, they are just fanatics who hate freedom."*
- *The Pivot:* Introduce the Paul-Elder intervention: *If terror were completely random and mindless, it wouldn't persist as a global phenomenon.* Shift the focus to

strategic logic: *"If we assume this non-state actor is a **Rational Actor** operating with extreme resource scarcity against a vastly superior state military, what is the calculated **Purpose** of this specific attack?"* (Introduce concepts like *attrition, provocation, or spoiling*).

Phase 2: Live Rhetoric vs. Strategy Tracking (15 Minutes)

- *Activity:* Project a 300-word excerpt from a counter-terrorism policy brief or a state's declaration of a "War on Terror."
- *Instructor Prompt:* Conduct a "Think-Aloud" analysis, color-coding the unstated assumptions:
 - *"Look at this policy clause. The state argues that terrorism can be eradicated solely through military elimination of the actors. Let's test this for **Depth**. What does this assume? It assumes a state-centric Point of View where violence has a clear end-point. But let's look at the **Implications**: If a state uses heavy-handed military force in a civilian area to kill a non-state actor, what is the structural consequence? It often legitimizes the terrorist group's narrative of state oppression, accelerating their recruitment. The solution itself feeds the problem."*

Phase 3: The Asymmetric Matrix Simulation (20–25 Minutes)

- *Activity:* Divide students into small groups. Assign each group a specific case study of asymmetric conflict (e.g., an urban insurgency, a transnational extremist network, or a historical national liberation movement). Split the groups into two analytical factions: *Team Strategic Rationalism* and *Team Critical Security Studies*.

- *Task:* Groups must analyze the assigned conflict by filling out a 3-part *Terrorism Analysis Matrix*:
 - i. *The Asymmetric Target (Purpose):* What is the group actually trying to alter? Are they trying to destroy the state's military (impossible), or are they trying to break the state's *political will* and psychological security? (Testing for *Precision*).
 - ii. *The State's Blind spot (Point of View):* How does the state's massive conventional military power blind it to the political nature of the conflict? Why does the state keep falling into the "provocation trap"?
 - iii. *The Systemic Consequence:* If the state responds with conventional military dominance, what is the inevitable long-term structural outcome for regional stability? (Testing for *Logic*).

Phase 4: The Epistemic Mirror Close (10 Minutes)

- *Activity:* Individual reflection exit ticket.
- ***Exit Ticket Prompt:*** “Look at the counter-terrorism strategies we analyzed today. Identify one major ***Assumption*** built into our domestic national security apparatus that might actually be making global terrorism more resilient rather than less. How does changing your lens from a moral one to a structural one alter what a 'solution' looks like?”

5. Higher Education IR Assessment Indicators

When grading their matrices or reflections, track their transition into clinical, systemic thinking:

- *Fails to Meet Standard* (High School Narrative): The student treats terrorism as an unexplainable moral failure or a purely psychological disease. They rely on

media-driven tropes, emotional adjectives, and fail to see the strategic utility of violence in asymmetric conflicts.

- *Meets University International Relations Standard:* The student analyzes terrorism as a weapon of the weak - a highly calculated, political strategy designed to leverage a state's own power against itself. They successfully deploy IR concepts like *asymmetric warfare*, *security dilemmas*, *signaling*, and *structural violence* without relying on personal emotional biases.

References

1. Amutabi, M.N. (2003). *The 8-4-4 system of education*. International Journal of Educational Development. 23
2. Browne, M. N & Keeley, S. M. (2014). *Asking the Right Questions. A Guide to Critical thinking*. Harlow: Pearson Education Ltd.
3. Burger, B. E. & Starbird, M. (2012). *The 5 Elements of Effective Thinking*. New Jersey: Princeton University Press.
4. Crusius, T. W & Channell, C. E. (1999). *The Aims of Argument*. London: Mayfield Publishing Company
5. Elder, L. and Paul, R. (1994), "Critical thinking: *Why we must transform our teaching.*" Journal of Developmental Education 18:1, Fall 1994.
6. Elgin, C. Z. 1996. *Considered Judgement*. New Jersey: Princeton University Press
7. Ennis, R. H. (1987). *A taxonomy of Critical thinking dispositions and abilities*. In Joan B. Baron and Robert J. Sternberg (Eds.).
8. Fisher, A & Tallant, J. (2016) *How to Get Philosophy Students talking. An Instructor's Toolkit*. London: Routledge Group.
9. Halpern, D. F, (1997). *Critical thinking Across the Curriculum*. New Jersey: Lawrence Erlbaum.
10. Jeptepkeny, A. & Keter, J. (2025). *The Influence of Inclusive Education Planning on the Implementation of Competency-Based Education (CBE) in Senior Schools in Kenya*. In Journal of Research, Innovation and Implications in Education.
11. Kahnemann, D. (2012). *Thinking, Fast and Slow*. London: Penguin Books Ltd.

12. Kahneman, D., Slovic, P., and Tversky, A. (1982). *Judgement under Uncertainty: Heuristics and Biases*. Cambridge: Cambridge University Press.
13. Maiorana, V. P. (1992). *Critical thinking Across the Curriculum: Building the Analytical Classroom*.
14. KICD (2017). *Competence Based Curriculum*
15. Ministry of Education (K) (2018) *Competency Based Education and Training Policy Framework*
16. Namwambah, D. T. (2026). *Foundations of Critical Thinking and Problem Solving*. Riga, Latvia (E.U): Scholars' Press. ISBN-9786630239928
17. Namwambah, D. T. (2020). *Critical Thinking and Problem Solving*. Riga, Latvia (E.U): Scholars' Press. ISBN-13: 978-613-8-93402-8
18. Namwambah, T.D. (2011). (Revised Ed.). *Essentials to Critical and Creative Thinking*. Njigua Books -Nairobi. ISBN 9966- 9813-4
19. Namwambah, T. D. (2016). *Introduction to Critical and Creative thinking*. A Self-Teaching Module.
20. Namwambah, T. (2014). *Elements and Pedagogy of Critical Thinking*. Nairobi: Dale publishers
21. Namwambah, T. (2010). *Think Critically and Creatively "A Thinkers' Companion"*. Dale -Nairobi. ISBN 7968- 4680-3-9
22. Richard P. (1997), *Educating Reason*. California Univ. Press.
Weston, A. (2018). *A Rulebook for Arguments*. Cambridge: Hackett Publishing Co. Inc.
23. Wilson, J. (2017). *Critical Thinking: A Beginner's Guide to Critical Thinking, Better Decision Making, and Problem Solving*. New York: C.S.I.P Publishers.

Recommended Journal Articles

1. <https://ideapublishers.org/index.php/lassij/article/view/10.1.5/a>
2. <https://ideapublishers.org/index.php/lassij/article/view/9.1.6/a>
3. <http://www.socialsciencejournal.in/search/6-3-166>
4. <https://ijlass.org/articles/8.3.1.1-11.pdf>
5. <http://www.iosrjournals.org/iosr-jrme/pages/vol10-issue2.Series-5.html>
6. https://saudijournals.com/media/articles/JAEP_43_11_8-123.pdf
7. <https://ideapublishers.org/index.php/lassij/article/view/10.1.5/a>

Annex: Leveraging Critical Thinking Pedagogies for CBE Competency Mastery

Note: This article, "*Leveraging Critical Thinking Pedagogies for CBE Competency Mastery*," functions as a rigorous philosophical exegesis and conceptual synthesis of this essential Guide. Operating at the intersection of epistemology and praxis, it shifts the discourse from mechanistic instructional methodologies to a profound interrogation of the ontological conditions requisite for genuine competency. It conceptualizes critical thinking not as a secondary, instrumental skill, but as the primary, constitutive modality through which the learner actively instantiates, validates, and internalizes knowledge. By illuminating the latent teleological structures of the Guide, this philosophical summary successfully elevates Competency-Based Education from a system of utilitarian task-execution to a robust, intellectually cohesive framework of cognitive emancipation and authentic mastery.

Leveraging Critical Thinking Pedagogies for CBE Competency Mastery

*Tom Destiny Namwambah
Kenyatta University*

=====

Abstract

Kenya is currently undergoing a historic educational paradigm shift, transitioning from the exam-centric 8-4-4 system to Competency-Based Education (CBE). While this transition aims to equip learners with practical skills for the 21st century, its operationalization risks succumbing to a mechanical, instrumental reductionism that prioritizes performance metrics over profound

intellectual growth. This paper provides a philosophical critique of the CBE framework, arguing that core competencies remain structurally superficial and ontologically unrealized without the foundational integration of critical thinking across disciplines. Drawing upon Immanuel Kant's critique of pure reason and his vision of *enlightenment as emancipation from self-incurred immaturity*, John Dewey's pragmatist *theory of reflective inquiry*, and Jürgen Habermas's *framework of communicative rationality*, we interrogate the epistemological assumptions underlying contemporary notions of "competence." We contend that critical thinking is not merely a discrete, horizontal skill, but the vital meta-competence required to elevate rote task execution into genuine epistemic agency, moral autonomy, and democratic citizenship and maturity. By reframing CBE through a philosophy of dialogical and autonomous inquiry, this study illustrates how learners transcend passive technocratic compliance to achieve transformative, independent thought. Ultimately, we argue that for the CBE transition to realize its liberatory and democratic promise, educational stakeholders must prioritize deep-seated critical inquiry over the superficiality of mere task mastery.

Key words: Competency-Based Curriculum (CBC), Competency-Based Education (CBE); Critical Thinking; Educational Philosophy; Epistemic Agency, Kenya, Meta-Competence, Pragmatism; Reflective Inquiry, Rational Pedagogy.

1.0 Introduction

The transition from Kenya's legacy 8-4-4 framework to the Competency-Based Education (CBE) model represents more than a structural realignment; it is a profound ontological shift in the philosophy of learning (Momanyi & Rop, 2020). For decades, the 8-4-4 system operated on a foundational premise that equated knowledge with retention and human worth with examination scores. It was a pedagogical architecture that treated the student as a passive vessel to be filled with standardized data, culminating in

high-stakes assessments that dictated destiny in a single stroke (Wanjohi, 2017).

By contrast, the inception of the Competency-Based Curriculum (CBC) in 2017, and its structural manifestation through the 2-6-3-3-3 timeline of pre-primary, primary, junior, and senior school pathways fundamentally redefines the essence of the learner (Republic of Kenya, 2017). Under this new paradigm, which blends pragmatism and progressivism, education is conceptualized not as the mere accumulation of facts, but as the active cultivation of being (Amunga et al., 2022). The focus pivots from *what a student remembers to who the student becomes*, prioritizing real-world utility, ethical values, and the organic nurturing of individual talent (Surr & Redding, 2017; Mulder, 2017).

Yet, this philosophical departure from the old scholastic orthodoxy does not occur in a vacuum. The transition from an exam-centric reality to a competence-driven ideal introduces a dialectical tension between vision and material reality (Sifuna & Obonyo, 2019). The promise of specialized career pathways and continuous assessments must contend with the stubborn inertia of existing societal structures.

1.1 Challenges to CBE Implementation in Kenya

The systemic transition of Kenya's education sector from the legacy 8-4-4 system to the Competency-Based Education (CBE) framework is built on a profound philosophical premise: true learning is demonstrated not through rote memorization, but through the observable application of knowledge, values, and skills (KICD, 2017). At the core of this radical paradigm shift is the ambition to activate core competencies, chief among them being critical thinking and problem-solving, which act as the cognitive engine required to translate abstract learning into actionable societal solutions (Ongesa, 2020). However, since its rollout, this progressive educational migration has faced immense structural, financial, and cultural bottlenecks (Isaboke et al., 2021). These challenges create a sharp philosophical contradiction between the

aspirational rhetoric of "unlocking competencies" and the material realities of the Kenyan classroom, threatening to undermine the development of the very intellectual autonomy the curriculum seeks to cultivate.

This tension is most visible in the acute deficit of foundational school infrastructure across Kenyan public institutions, a material shortage that directly stifles empirical inquiry and analytical dialogue. Critical thinking cannot thrive in an intellectual vacuum; it demands collaborative, experiential spaces where learners can experiment, evaluate data, and engage in cognitive trial and error (Githui et al., 2017). Yet, the implementation of specialized Senior Secondary School pathways - particularly the Science, Technology, Engineering, and Mathematics (STEM) tracks has been severely crippled by a widespread lack of functional laboratories, technology workshops, and digital equipment (Isaboke et al., 2021). This resource scarcity is further compounded by heavily congested classrooms resulting from high enrollment rates that drastically outpace physical infrastructure expansion (EAJESS, 2026). When marginalized and rural schools are denied these critical learning tools while their urban counterparts remain comparatively equipped, CBE's promise of universal competency development is hollowed out, reducing the tenability of critical thinking skills to an abstract luxury dependent on geographic privilege.

Furthermore, the human catalyst required to unlock these higher-order competencies: the Kenyan educator, is constrained by institutional and systemic pressures that actively hinder the practice of critical pedagogy. For teachers to effectively nurture critical thinking and ethical reasoning in secondary learners, they must first possess deep content mastery and pedagogical freedom (Ongesa, 2020). Instead, implementation strategies have relied heavily on rushed, superficial in-service retraining workshops that leave veteran educators ill-prepared to facilitate complex, learner-centered instruction (Gachahi et al., 2024). This pedagogical vulnerability is aggravated by severe understaffing across public schools, which frequently forces non-specialized teachers to teach

advanced technical or science-based tracks. Overburdened by the immense administrative fatigue of tracking continuous school-based assessments, student portfolios, and practical projects, teachers are often reduced to bureaucrats of compliance rather than mentors of critical inquiry (LinkedIn, 2025).

The systemic friction of this educational transition extends deeply into the domestic sphere, transforming the collaborative ideals of CBE into a source of severe financial anxiety and conceptual confusion for Kenyan households. Unlocking authentic competencies requires extensive project-based learning, yet these practical tasks consistently force parents to purchase expensive materials, tools, and printing services, effectively commodifying public education and shifting state burdens onto vulnerable families (Isaboke et al., 2021). Furthermore, public participation and stakeholder sensitization have been historically inadequate, leaving many working-class parents struggling to comprehend their expected roles as they are compelled to assist with complex homework requirements (Wairimu, 2022). This lack of clear systemic guidance manifests as career pathway chaos during the Senior School selection process, where Kenyan students frequently choose specialized tracks based on peer pressure or parental anxiety rather than critical self-assessment - a misalignment that threatens to cause massive waves of course-correction when these cohorts eventually transition into higher education.

Administratively, the transition of learner cohorts into Grade 10 Senior Secondary Schools has exposed deep institutional inequities that threaten the democratic promise of education in the critical faculty. The rollout has triggered massive systemic backlogs and delayed school reporting for hundreds of thousands of learners due to placement inefficiencies within online management systems (EAJESS, 2026). Crucially, this transition friction does not impact all social classes equally; wealthier families seamlessly bypass under-resourced public tracks by financing private resources, external technical training, and elite schools (LinkedIn, 2025). This widening inequality gap creates a stratified educational landscape

wherein privileged students access the rich environments necessary to hone critical capabilities, while underprivileged learners remain confined to underfunded systems. Consequently, without deliberate state intervention, uncoordinated curriculum reform risks converting CBE into a mechanism that institutionalizes social stratification under the guise of modernization.

Despite this formidable landscape of infrastructure deficits, teacher burnout, and socioeconomic strain, the Kenyan educational community continues to struggle for the realization of the curriculum's core promises. Teachers, administrators, and parents remain locked in a collective effort to extract relevance, equity, and best practices from this volatile transition (Isaboke et al., 2021). This persistence underscores a shared, stubborn faith in the transformative power of learning, recognizing that the friction of the current implementation is not a final destination but the chaotic evolution of a system in transition. It is within this crucible of trial and structural adaptation that the institutional dust must settle. Ultimately, optimizing the structural mechanics of CBE in Kenya is an urgent imperative, ensuring that the framework is fully aligned with the intellectual necessity of fostering critical thinking to unlock true learner competencies.

1.2 Philosophical Pillars of CBE

The foundational philosophy of Competency-Based Education (CBE) represents a radical epistemological shift, transitioning pedagogy from passive, time-bound content consumption to the active, demonstrable mastery of practical skills, knowledge, and attitudes (Sullivan & Downey, 2021). Rather than quantifying academic progress through the arbitrary metric of seat-time, CBE reclaims the true purpose of education by prioritizing what a learner can authentically execute in real-world contexts (Miglani et al., 2026; Voorhees, 2001). This paradigm is fundamentally anchored in John Dewey's Pragmatism, which rejects rote memorization in favor of experiential learning-by-doing and practical problem-solving (Dewey, 1916). By framing knowledge as an instrument for action, Pragmatism demands that education be judged by its utility,

establishing a conceptual landscape where learning is intrinsically tied to lived experience and continuous inquiry (Dewey, 1938).

Complementing this pragmatic foundation, CBE draws deep conceptual strength from Constructivism and Humanism to honor individual learner agency (Vygotsky, 1978; Rogers, 1969). From a constructivist lens, the learner is no longer a passive vessel to be filled, but an active epistemological agent who dynamically builds personal understanding and competence through direct interaction with their environment (Piaget, 1970). This matches the progressive and humanist commitment to the whole student, which manifests operational principles like learner-centered design and self-directed pacing (Knowles, 1975). Within this framework, mastery-based progression and authentic assessments replace traditional, high-stakes testing, ensuring that students advance only when they have synthesized knowledge into demonstrable, personal capability (Wiggins, 1998).

On a broader systemic scale, CBE aligns its individualist goals with Social Reconstructionism, transforming education into a tool for collective societal and economic evolution (Freire, 1970). By directly linking educational outcomes to 21st-century workforce demands and civic responsibilities, the model ensures that personal growth translates into national progress (MoE Kenya, 2017). This philosophy in action holistically dismantles traditional, rigid exam-driven frameworks - such as the legacy 8-4-4 system - in favor of an inclusive architecture designed to cultivate seven core competencies: *Communication and Collaboration, Critical Thinking and Problem Solving, Creativity and Imagination, Citizenship, Digital Literacy, Learning to Learn, and Self-Efficacy* (KICD, 2017). These competencies represent the essential capacities required for modern citizens to thrive and contribute meaningfully to their communities (MoE Kenya, 2020).

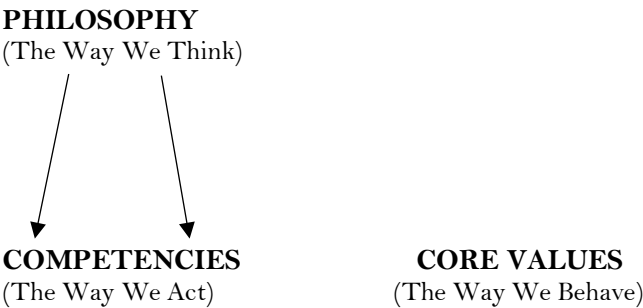
While current educational policies present these seven competencies as a flat hierarchy of co-equal pillars, educational good practice reveals a deeper structural truth: the entire CBE architecture is inherently dependent on a singular intellectual

engine (Ennis, 2015). Although no single competence has been officially pronounced predominant, contemporary academic debates increasingly recognize that Critical Thinking and Problem Solving cannot be treated as merely one objective among many (Facione, 2011; Paul & Elder, 2019). Instead, critical thinking must be recognized as the foundational catalyst through which all other competencies are activated (Lipman, 2003). Without the ability to analyze, evaluate, and prioritize information, a learner cannot genuinely collaborate, innovate, navigate digital landscapes safely, or drive their own lifelong learning (Bailin et al., 1999).

Consequently, educational architects must conceptually elevate critical thinking to an "umbrella competence" that overarches and supercharges the entire curriculum (Nyamosi, 2024; McPeck, 1981). For instance, authentic communication requires the critical evaluation of audience and intent, while meaningful citizenship demands the interrogation of social justice and systemic structures (Siegel, 1988). Similarly, digital literacy remains superficial without the critical discernment needed to filter misinformation, and creativity becomes hollow without the analytical problem-solving required to turn imagination into innovation (Sternberg, 2003). By deliberately positioning "teaching for critical thinking" as the primary pedagogical mechanism, educators unlock the cognitive pathways necessary for the robust development of every other intended capacity (Elder & Paul, 2020).

This philosophical restructuring ultimately resolves the conceptual relationship between the core components of the CBE framework, which operate as an inseparable triangle of educational purpose (KICD, 2018). The founding philosophy of CBE provides the existential "*why*" of education, the seven competencies provide the operational "*how*," and the core values supply the indispensable moral "*anchor*" (Akala, 2021). Crucially, it is the disciplined mechanism of critical thinking that serves as the crucible for this entire matrix, acting as the substantial trigger that transforms abstract philosophy into lived competence (Scheffler, 1973). By anchoring the curriculum in the primacy of thought, CBE evolves

from a mere structural alternative to traditional schooling into a transformative cognitive awakening (Amunga et al., 2023). Below is the hierarchical demonstration:



Understanding the inherent practicality of this pedagogical philosophy provides a compelling resolution to the systemic friction and implementation tailbacks currently bedeviling the execution of the educational framework. This efficacy arises because the foundational tenets of Competency-Based Education (CBE) do not merely prescribe a set of mechanical procedures; rather, they inspire an intrinsic system of ethics by cultivating the mind into an acute critical faculty capable of discerning meaning and acting judiciously (Ennis, 2015; Scheffler, 1973). This structural foundation relies fundamentally upon the tenets of humanism and progressivism, which theoretically reposition learners as holistic, multi-dimensional human beings rather than passive academic storage units destined for rote consumption (Knowles, 1975; Rogers, 1969). Central to this existential shift is a constellation of cardinal core values, namely *love, responsibility, respect, unity, peace, patriotism, social justice, and integrity*. Consequently, instead of viewing peers as existential competitors to be vanquished in a zero-sum national ranking, the philosophical framework demands that learners recognize one another as dignified human beings deserving of mutual respect and collective empathy.

Secondly, these deeply embedded values provide a structural grounding for the seven core competencies, ensuring an interconnectedness that elevates the moral and functional value of

the entire educational spectrum. In an era where technological acceleration routinely outpaces human comprehension and ethical regulation, the possession of high-level competencies stripped of moral parameters becomes distinctively hazardous (Paul & Elder, 2019). Technical proficiency in digital systems devoid of integrity inevitably manifests as cybercrime, just as potent rhetorical and communication capacities untethered from respect quickly degenerate into psychological manipulation. Within the CBE architecture, values act as the indispensable ethical guardrails, guaranteeing that advanced cognitive and behavioral competencies are deployed exclusively toward constructive, humanizing ends.

Thirdly, the deliberate cultivation of citizenship, patriotism, and social justice serves as the indispensable cornerstone for engineering a cohesive, self-respecting, and unified nation-state. In isolation, the competency of citizenship, defined as the mere functional understanding of one's local and national community remains an empty civic construct unless it is explicitly animated by the core values of patriotism and social justice (Freire, 1970). It is the synthesis of this competency with these precise moral virtues that drives students to transcend passive awareness; it actively compels them to utilize their civic agency to love, embrace, and systematically uplift marginal or diverse segments of their society (Republic of Kenya, 2017). Through this alignment, the abstract concept of civic duty is transformed into a lived, compassionate practice of national solidarity.

Fourthly, the actualization of effective collaboration requires that students actively internalize and practice the values of unity and respect when interacting with diverse paradigms within their peer groups. For collaboration to evolve past a superficial division of labor, learners must genuinely appreciate the cultural diversity, epistemic variations, and distinct ways of life that characterize other community members, taking conscious pride in the heterogeneous fabric of their society (Bailin et al., 1999). This is the precise locus where the operational competency of communication and collaboration intersects with the ethical imperatives of unity and

respect. By learning to decenter their own perspectives, students transform group dynamics from sites of competitive friction into collaborative, inclusive ecosystems.

Fifthly, a profound dialectical relationship exists between the competency of self-efficacy and the core value of responsibility. The operational capacity for self-efficacy - characterized by internal self-drive, emotional intelligence, and personal confidence - relies entirely upon the ethical cultivation of responsibility, which demands that the individual take absolute ownership of their actions, time, and academic progression (Akala, 2021). To assume this degree of ownership requires a radical ontological shift, wherein the student transitions from a passive spectator of institutional mandates into the conscious driver of their own destiny. By fully internalizing responsibility for their choices and progress, learners abandon the disempowering habit of projecting blame onto external factors, opting instead to critically engineer tangible solutions. This reflective mindset builds durable self-confidence, fuels continuous cognitive growth, and systematically refines daily habits into lifelong, autonomous capabilities.

Sixthly, the modern digital landscape necessitates a tight conceptual pairing between digital literacy and digital integrity. While digital literacy equips the learner with the essential technical mechanics to locate, evaluate, and disseminate information safely through technological mediums, it remains a purely functional tool (KICD, 2017). It is digital integrity - defined as acting with honesty, respect, and deep accountability online - that transforms this literacy into an ethical practice. When navigating sophisticated online platforms, learners must anchor their technological competence in integrity to actively reject plagiarism, cyberbullying, or dishonest digital habits (Nyamosi, 2024). Together, digital literacy and integrity empower individuals to decipher digital disinformation, construct authentic relationships of trust, and thrive both within contemporary academic spaces and the future digital economy.

Ultimately, the three definitive dimensions of the CBE model; *philosophy, competencies, and values*, are inextricably entwined and synthesized within real-world output. When these elements align, education successfully moves away from the reductionist paradigm of merely passing high-stakes examinations. For example, during a Community Service Learning (CSL) project, a student does not merely execute a task; they deploy the competency of critical thinking driven by the intrinsic values of love and responsibility to diagnose and solve a local pollution crisis (Amunga et al., 2020). This holistic application achieves the ultimate social reconstructionist goal of the CBE philosophy: the engineering of a balanced, highly skilled, and ethically grounded society (Dewey, 1916). These core values are absolutely essential to the architecture of CBE because they directly fulfill three systemic functions:

- *Combating "Intellectual Criminality"*: Developing practical skills like digital literacy in an ethical vacuum simply creates highly sophisticated, smart cybercriminals. Infusing core values ensures that 21st-century capabilities are harnessed strictly for ethical advancement (Paul & Elder, 2019).
- *Transforming Classrooms into Communities*: By deliberately replacing the legacy system's hyper-competitive national ranking structures with the foundational virtues of love and unity, CBE encourages learners to celebrate and validate each other's diverse developmental pathways and individual pacing, rather than viewing peers as institutional rivals (Sullivan & Downey, 2021).
- *Driving Autonomous Accountability*: The mastery-based progression characteristic of CBE inherently demands that learners take personal responsibility for generating authentic portfolio evidence, executing practical tasks, and steering their own skill acquisition, shifting the locus of control entirely to the student (Voorhees, 2001).

To fully understand how critical thinking functions as the unifying agent, it is necessary to examine the epistemological assumptions

underlying CBE design. Traditional educational paradigms operate on an objectivist epistemology, treating knowledge as an external, static entity to be transferred into the learner's cognitive storage (Biesta, 2014). Conversely, the integration of multiple competencies within CBE presumes a constructivist and fallibilist epistemology, where knowledge is dynamically generated, context-dependent, and constantly subject to revision through active engagement (Wiggins, 1998). In this landscape, critical thinking acts as the primary epistemological engine; it transforms raw informational inputs into validated, actionable competencies. Without this analytical filter, the acquisition of competencies risks degenerating into the uncritical assimilation of fragmented procedural skills.

This theoretical imperative to emancipate the mind from passive assimilation finds its ultimate rational foundation in Immanuel Kant's Enlightenment philosophy. Kant (1784) famously defined enlightenment as the human being's emergence from self-incurred immaturity, rallying under the imperative *Sapere aude* - dare to know, or have the courage to use your own understanding. In a Kantian framework, an educational model that dictates *what* to think through rote parameters subjects the learner to heteronomy, a state where the intellect is governed by external commands (Kant, 1784). Elevating critical thinking to the apex of CBE is an intentional and strategic act of cultivating intellectual autonomy, encouraging students to legislate their own cognitive and moral paths (Kant, 1803). By shifting from passive consumption to active reasoning, CBE fulfills Kant's demand that human beings must never be treated as mere instruments or empty vessels, but as autonomous agents capable of independent critique (Kant, 1784; Kant, 1803).

Furthermore, Kant's *Critique of Pure Reason* establishes that our understanding actively organizes raw sensory experiences through specific cognitive concepts, rather than simply mirroring the world (Kant, 1781). This transcendental perspective directly provides the historical lineage for constructivist frameworks embedded within CBE. To build authentic competencies like digital literacy, self-

efficacy, or innovation, a learner cannot simply copy external structures; they must critically evaluate, synthesize, and categorize their experiences using their own reason (Kant, 1781; Kant, 1803). Critical thinking, seen through a Kantian lens, operates as the regulatory baseline of the intellect. It ensures that the competencies developed are not merely disconnected mechanical responses to economic pressures, but the balanced products of an integrated, self-regulating mind (Kant, 1781).

This focus on individual, self-legislating cognitive autonomy provides an essential conceptual bridge to John Dewey's pragmatist theory of reflective inquiry. While Kant establishes the internal structures of independent reason, Dewey brings these structures directly into the human environment, positing that genuine thinking is sparked by a state of perplexity, doubt, or a "forked-road situation" that disrupts passive habit (Dewey, 1910). Reflective inquiry is the disciplined, intentional effort to guide the mind through this state of uncertainty toward a well-grounded conclusion. Within the CBE matrix, competencies like problem-solving and self-efficacy cannot develop through smooth, routinized tasks; they require the learner to actively confront problematic real-world environments, form hypotheses, test them through action, and reflect on the consequences (Dewey, 1938). Elevating critical thinking to a core competence ensures that education models this exact reflective loop, turning every learning experience into an active crucible for cognitive growth.

From this pragmatist vantage point, knowledge is not a passive mirror of reality but an instrument for navigating life - a concept Dewey termed "instrumentalism" (Dewey, 1916). The value of any competence within CBE is therefore determined by its capacity to improve the learner's transaction with their social and physical environment. Critical thinking bridges the gap between abstract thought and practical execution, ensuring that operational capacities like digital literacy or collaboration do not become mechanistic or rigid. By embedding reflective inquiry into the heart of the curriculum, educational architects shift the metric of success

from what students know in theory to how effectively they can think through novel, ambiguous challenges.

However, because CBE explicitly links educational outcomes to community service, citizenship, and workforce alignment, its epistemological framework must transcend individual inquiry and address collective action. While Kant secures internal autonomy and Dewey models external environmental adaptation, the democratic coordination of society requires a linguistic, intersubjective baseline. This social dimension finds a powerful theoretical anchor in Jürgen Habermas theory of communicative rationality. Habermas (1984) argued that human rationality is not merely instrumental, designed for the technical manipulation of objects, but inherently communicative, aimed at achieving mutual understanding and uncoerced consensus within a community. When CBE highlights competencies like communication, collaboration, and citizenship, it implicitly adopts this communicative framework. To prevent these competencies from turning into tools for strategic deception or manipulation, they must be fundamentally guided by an overarching commitment to critical, rational dialogue.

Communicative rationality assumes that language and interaction are governed by implicit "validity claims", specifically, expectations of truth, moral rightness, and comprehensibility (Habermas, 1984). It is through the faculty of critical thinking that learners gain the capacity to interrogate these claims, identifying bias, expose power structures, and hidden systemic distortions in discourse. When applied to CBE, teaching for critical thinking shifts communication from a passive exchange of words to a rigorous space of democratic deliberation. Students learn to back their assertions with valid reasons, listen empathetically to opposing viewpoints, and collectively construct solutions to societal issues. Critical thinking thus elevates collaboration from a simple division of labor into a shared ethical pursuit of truth and social justice.

Synthesizing the insights of Kant, Dewey, and Habermas reveals that a truly transformative CBE model must balance instrumental

efficiency with communicative ethics (Lipman, 2003). Kant's critique secures the foundational necessity for individual intellectual autonomy; Dewey's reflective inquiry provides the learner with the cognitive tools to problem-solve and adapt to a rapidly changing material landscape; and Habermas's communicative rationality ensures that this problem-solving capacity is directed toward democratic, ethical, and collaborative community life. By anchoring the seven competencies in this deep philosophical foundation, educational architects prevent the curriculum from being co-opted by purely market-driven, technocratic demands. Instead, critical thinking becomes the ultimate mechanism for liberating the mind, allowing students to navigate both technical systems and human relationships with equal sophistication.

Ultimately, this combined philosophical analysis reshapes our understanding of the output of Competency-Based Education. The epistemological assumption of CBE is that true mastery is holistic, demanding an inseparable alignment of action, intellect, and ethical responsibility (Mulder, 2017). By utilizing Deweyan inquiry to tackle systemic practical issues and Habermasian discourse to cultivate civic unity, the learner embodies the highest ideals of progressivism and social reconstructionism. Critical thinking is then exposed not merely as an isolated cognitive skill set, but as the foundational intellectual spark that makes all other competencies humanizing, ethical, and socially transformative.

1.3 Criticality amid Flux: Navigating 21st-Century Workforce Dynamics and Kenya's Systemic Demands

The contemporary global landscape is characterized by a condition of perpetual and accelerating uncertainty, marked by systemic pressures, existential challenges, and a destabilizing influx of conflicting ideological narratives that threaten to overwhelm human agency (Biesta, 2014). This complex, rapidly shifting environment demands an epistemological reorientation; our collective capacity to adeptly navigate these fluid challenges directly determines our potential to live meaningfully and exercise

stewardship over a world on a spin with itself (Lipman, 2003). Consequently, the cultivation of an advanced mental faculty for critical thinking serves as an indispensable prerequisite for human flourishing (Siegel, 1988). Developing structured methods for intellectual criticality, systematic problem-solving, and decisive decision-making provides individuals with the analytical armor necessary to diagnose authentic problems, mitigate systemic risks, and execute ethically sound judgments (Paul & Elder, 2019). By consciously anchoring human intelligence in reflective critique, modern education can transcend technical training to actively alleviate societal suffering and engineer a more enlightened, balanced global community (Scheffler, 1973).

To address these unfolding existential challenges, critical thinking must be positioned as the primary engine driving the architectural shift toward Competency-Based Education (CBE). This imperative systematically replaces the reductionist, passive memorization of traditional pedagogy with a vibrant, active framework of conceptual analysis, forcing learners to rigorously evaluate empirical evidence, interrogate deeply entrenched assumptions, and confront real-world dilemmas (Ennis, 2015). Without this central engine of criticality, a competency-based framework inevitably fractures into disconnected, mechanical tasks, failing to realize the authentic, practical capabilities intended by the system (Voorhees, 2001). Recognizing this necessity, modern educational reforms, most notably exemplified by Kenya's shift away from legacy, exam-centric architectures, have actively embraced critical thinking to transition pedagogy from rote retention to deep, experiential application (KICD, 2017). This specific paradigm shift redefines the classroom environment by prioritizing three distinct dimensions of cognitive transformation:

- a. *Deep Conceptual Understanding*: Students transcend the superficial acquisition of static facts to analytically deconstruct the systemic mechanics of how and why phenomena operate (Wiggins, 1998).

- b. *Active Epistemic Participation*: Learners reject the passive consumption of teacher-led dictates, transforming into active agents who directly struggle with, test, and reformulate ideas (Dewey, 1938).
- c. *The Deconstruction of Bias*: The curriculum equips students with the intellectual tools to recognize subjective personal assumptions, confront systemic prejudices, and empathetically evaluate alternative global viewpoints (Bailin et al., 1999).

Furthermore, by structuring instruction around real-world application, this critical engine transforms how students diagnose and resolve modern complex crises. In this context, problem-solving ceases to be an abstract exercise and becomes a lived, investigative practice focused on three core operational pillars:

- a. *The Articulation of Practical Solutions*: The curriculum structures engagement around messy, ill-defined social and economic challenges, training students to dissect intricate issues into conceptually manageable components (Mulder, 2017).
- b. *Inquiry-Based Epistemic Growth*: Natural curiosity is systematically elevated into disciplined academic inquiry, driving learners to independently investigate problems, formulate rigorous hypotheses, and evaluate outcomes (Dewey, 1910).
- c. *Dynamic Structural Adaptability*: Armed with reliable, structured reasoning paths, self-efficacious students develop the intellectual confidence needed to navigate completely unfamiliar spaces and unexpected systemic disruptions (Elder & Paul, 2020).

Ultimately, by emphasizing the absolute necessity of preparing students for future societal flux through the primacy of thought, CBE aligns itself with the pressing personal, economic, and civic demands of the 21st century (Ministry of Education, 2020). This alignment ensures that the output of basic schooling satisfies three vital societal requirements:

- a. *Workforce Optimization*: Modern economic environments heavily favor individuals who possess the logical adaptability to reason under pressure and make sound, autonomous decisions (Sullivan & Downey, 2021).
- b. *Informed, Ethical Decision-Making*: Learners develop the cognitive foresight to weigh competing consequences and systemic benefits within both their personal choices and broader professional obligations (Facione, 2011).
- c. *Autonomous, Lifelong Independence*: The model cultivates self-directed, reflective individuals who continuously evaluate, interrogate, and self-correct their own thinking patterns long after exiting formal institutional structures (McPeck, 1981).

When looking at economic production, this cognitive engine acts as a direct response to the specific, volatile transformations defining the 21st-century workforce. The contemporary corporate and industrial landscapes have completely abandoned legacy, predictable industrial tasks in favor of hyper-automated, data-dense, and non-linear working ecosystems (Mulder, 2017). In this landscape, technical literacy and specialized skills become obsolete overnight unless they are tightly bound to a resilient meta-cognitive capacity. Critical thinking supplies this exact cognitive layer, transforming an employee from a rigid task-executor into an adaptive strategic analyst who can systematically diagnose automated disruptions and re-engineer institutional frameworks under pressure (Sullivan & Downey, 2021). Consequently, modern labor markets no longer value passive data aggregation; they reward the highly critical capacity to verify source credibility, balance competing risks, and generate innovative solutions amidst systemic ambiguity (Paul & Elder, 2019).

Expanding beyond general workplace optimization, the rise of the Fourth Industrial Revolution imposes unique demands on emerging markets, making critical thinking a prerequisite for survival rather than a professional luxury (Sternberg, 2003). As artificial intelligence, machine learning, and decentralized

technologies fundamentally reorganize commercial transaction paths, the premium on human labor shifts entirely toward creative and evaluative domains (Sullivan & Downey, 2021). Rote tasks are rapidly consumed by automated algorithms, leaving human workers responsible for the ethical oversight, systemic integration, and conceptual modeling of complex industrial flows (Voorhees, 2001). CBE addresses this shift by ensuring that technological competencies, such as digital literacy, are not taught as isolated computational skills (KICD, 2017). Instead, by filtering these skills through an umbrella of critical inquiry, learners develop the capacity to continuously upskill, reinvent their professional identities, and chart innovative economic pathways in an unstable workforce ecosystem (Elder & Paul, 2020).

On a localized level, this critical engine provides a vital antidote to the chronic, deep-seated structural issues that historically weakened the Kenyan socio-educational landscape under the legacy 8-4-4 paradigm (Akala, 2021). For nearly four decades, the previous curriculum operated on an intensely high-stakes, exam-driven culture that mistakenly reduced educational excellence to the mechanical reproduction of static facts (Amunga et al., 2020). This intense focus on performance metrics not only caused pervasive psychological strain among learners, but it actively produced "siloe graduates" - individuals who excelled at memorizing textbook concepts but struggled with the practical analysis required to resolve real-world community issues (Nyamosi, 2024). By replacing this high-pressure, rote structure with a deliberate competency-based model, Kenya aims to dismantle this dynamic, moving education away from rigid certification toward the cultivation of authentic, contextually rooted human capability (Ministry of Education, 2020).

Moreover, this shift addresses broader economic and civic vulnerabilities within the Kenyan nation, particularly regarding youth unemployment and civic fragmentation (Republic of Kenya, 2017). The historic gap between academic training and actual industrial demands left thousands of graduates without the critical

problem-solving skills required by local emerging markets, tech hubs, and agrarian innovations (Miglani et al., 2026). Concurrently, a civic landscape exposed to unverified digital narratives and social manipulation demands a highly discerning, politically literate citizenry that can look past ethnic polarizations and critically engage with democratic justice (KICD, 2017). By anchoring the curriculum in independent, autonomous thought, CBE systematically addresses these exact vulnerabilities. It equips Kenyan youth to confidently drive agricultural developments, lead digital spaces, and participate in rational, unified democratic systems that actively support national solidarity (Akala, 2021).

1.4 Understanding Critical Thinking

Etymologically, critical thinking operates as a foundational modern tribunal of the mind, explicitly dealing with the methodical testing, verification, and evaluation of proposed solutions to a problem or the provisional explanations of a phenomenon (McPeck, 1981). To think critically is to wield cognitive skills and deliberate meta-cognitive strategies effectively, thereby increasing the probability of achieving a desirable, rational outcome (Paul & Elder, 2019). It is a form of thinking that is intrinsically purposeful, reasoned, and goal-directed - the precise intellectual architecture involved in effective problem-solving, the calculation of likelihoods, the structural formulation of inferences, and decisive decision-making (Ennis, 2015). Crucially, as a reflective way of being, critical thinking demands a self-referential evaluation of our own thinking processes; it requires an ongoing interrogation of the reasoning that informs the conclusions we arrive at and a systematic auditing of the complex factors we consider when making choices (Elder & Paul, 2020).

At its core, this cognitive paradigm can be understood as the active analysis of facts to understand a problem or topic thoroughly, manifesting as a clear, rational process of interpreting information instead of accepting it at face value (Facione, 2011). The critical thinking process typically unfolds through progressive, disciplined phases: collecting data, asking thoughtful questions, and dissecting

possible solutions (Bailin et al., 1999). This intellectual practice is fundamentally driven by a faith in the supremacy of reason, requiring virtues of honesty, integrity, fair-mindedness, courage, empathy, and open-mindedness (Siegel, 1888). In its broadest sense, critical thinking stands as a disciplined, active process of conceptualizing, applying, analyzing, synthesizing, and evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, serving as a reliable guide to belief and action (Lipman, 2003). In its exemplary form, it transcends subject matter divisions, relying on universal intellectual values such as clarity, accuracy, precision, consistency, relevance, sound evidence, good reasons, depth, breadth, and fairness (Paul & Elder, 2019). It aims to reason through multifaceted pathways, analyzing presented data to attain the highest desirable good, evaluating facts to establish their truth value, solving problems to satisfy the worth of reasoning, and making choices to resolve the myriad challenges confronting the contemporary world (Scheffler, 1973).

Viewed through this lens, critical thinking possesses two distinct components: a robust set of skills to process and generate information, and a habit, based on deep intellectual commitment, of using those skills to guide everyday behavior (Facione, 1998). It stands in sharp contrast to the mere acquisition and retention of information alone, because it radically alters how information is sought and treated; it is similarly distinct from the mere possession of skills, as it demands their continual use, and it rejects the empty exercise of those skills without acceptance of their real-world results (Bailin et al., 1999). As emphasized by the MCC General Education Initiative (1995), critical thinking includes the capacity to respond to material by distinguishing between facts and opinions, personal feelings and objective judgments, inferences and observations, and inductive and deductive arguments. It empowers the learner to generate questions, construct and recognize the structure of arguments, adequately support assertions, define complex issues, sort and classify data, integrate information, see relationships, draw informed conclusions, suspend beliefs, and

remain open to unfamiliar cultural systems and values (MCC General Education Initiative, 1995).

In the context of Competency-Based Education (CBE), critical thinking translates into a purposeful, self-regulatory judgment that results in interpretation, analysis, evaluation, and inference, as well as a thorough explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which judgment is based (Facione, 1998). It functions as an essential tool of inquiry for CBE, serving as a liberating force in Kenya's current education system and a powerful resource in the learners' personal and civic life (KICD, 2017). While not synonymous with good thinking in the abstract, it remains a pervasive and self-rectifying human phenomenon (Lipman, 2003). The ideal critical thinker is habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair-minded in evaluation, honest in facing personal biases, prudent in making judgments, and persistent in seeking results which are as precise as the circumstances permit (Facione, 2011). Educating good critical thinkers' means working towards this ideal, combining skill development with the nurturing of dispositions that yield useful insights and form the basis of a rational, judicious, and democratic society (MoE Kenya, 2020).

From the foregoing, it is clear that critical thinking is not only the central core competence of CBE, but it is the rational justification by which judgment of ultimate reality is arrived at (Akala, 2021). It involves following evidence where it leads, considering all possibilities, relying on reason rather than emotion, weighing the effects of motives and biases, being concerned more with finding the truth than with simply being right, and refusing to allow native egocentricity to sway one's thought (Paul & Elder, 2019). Within this operational framework, Walde (1995) identifies eight relevant characteristics of critical thinking for CBE: *asking questions, defining a problem, examining evidence, analyzing assumptions and biases, avoiding emotional reasoning, avoiding oversimplification, considering alternative interpretations, and tolerating ambiguity.*

Dealing with ambiguity is also recognized by Strohm and Baukus (1995) as an essential part of critical thinking, noting that ambiguity and doubt serve a critical-thinking function and are a necessary, productive part of the cognitive process. Because real-world problems are complex, messy, and lack clear answers, tolerating ambiguity prevents quick jumps to distorted answers, encourages deep inquiry, improves choice-making by weighing risks, and helps learners update their views when new facts appear (Strohm & Baukus, 1995).

The cognitive processing of ambiguity inherently guards the mind against the reductionist tendency of rushing to fast, weak conclusions, ensuring instead that the cognitive landscape remains elastic and receptive to evolving empirical insights. When learners lean into cognitive friction rather than fleeing from it, they actively reduce subjective bias, thereby shielding their analytical paths from easy but misleading or distorted configurations (Strohm & Baukus, 1995). Furthermore, this dispositional tolerance sparks sustained academic inquiry, explicitly granting the mind the chronological and intellectual space required to seek out deep, multi-layered proof before constructing definitive judgments (Walde, 1995). In terms of strategic application, it vastly improves operational choices, training the student to meticulously weigh structural risks and balance competing variables before executing final decisions (Facione, 1998). Ultimately, this capacity fosters a posture of dynamic intellectual humility, preparing the learner to gracefully accept paradigm shifts and dynamically update their worldview whenever new, undeniable facts enter their cognitive environment (Paul & Elder, 2019).

To successfully transform these analytical paradigms into practical classroom achievements, the curriculum must isolate and nurture specific critical thinking skills, which operate as the fundamental cognitive processes underlying all critical thinking tasks (Bailin et al., 1999; Facione, 1998; Siegel, 1985). As the core pillar of Competency-Based Education (CBE), these targeted cognitive processes move learners far past simple memorization, explicitly

equipping them to systematically analyze facts, critically judge evidence, and solve real-world problems (Voorhees, 2001). This specific skill set turns passive listeners into active problem-solvers and decisive decision-makers who no longer rely on rote instruction to navigate economic or social environments (Ennis, 2015). Consequently, the primary educational objective within a competency-based model shifts from distributing static data to cultivating concrete cognitive practices, establishing a curriculum where performance is judged by how precisely a student can execute independent intellectual labor (Wiggins, 1998).

The vital matrix of specific skills to be systematically cultivated among CBE learners includes observation, explanation, effective communication, inference, analysis, interpretation, evaluation, reasoning, and practical problem-solving (Facione, 1998). By embedding these precise cognitive processes into the foundational architecture of the curriculum, CBE ensures that learning transforms from the static, mechanical accumulation of factual scripts to a dynamic, self-correcting cognitive awakening (KICD, 2017). This structural cultivation enables the learner to confidently dissect intricate social crises into manageable intellectual parts, generating reliable explanations and inferences that are as precise as the circumstances permit (Bailin et al., 1999). Through this targeted framework, the educational system successfully delivers on its progressive promise, producing highly capable individuals who can independently navigate technical challenges, drive industrial innovations, and contribute ethically to their democratic societies (MoE Kenya, 2020).

1.5 Value and Importance of Critical Thinking to Education and in Life

It has been unequivocally stated that at the heart of Kenya's educational renaissance lies critical thinking, an intellectual catalyst that transcends mere rote memorization to cultivate authentic habits of thought. Far from being a passive receptacle of information, the modern Kenyan learner is therefore invited to utilize reason as the primary engine of human existence, thinking

outside conventional boundaries to navigate a rapidly changing world. By embedding critical thinking into the core of CBE, education in Kenya evolves from a mechanical utility into a transformative process that awakens cognitive independence, allowing learners to transition from passive consumers of knowledge to active, rational agents of their own destiny (Amutabi, 2019).

Philosophically, critical thinking fosters a remarkable breadth of vision, equipping learners with the epistemological agility to perceive reality from a multitude of diverse viewpoints. Within the Kenyan educational context, this pluralistic outlook is essential for bridging cultural, social, and economic divides, encouraging individuals to examine alternatives and choose pathways that lead to an examined and worthy life. This self-perspective allows learners to transcend immediate, parochial interests, grounding their daily choices in a deeper understanding of human existence. Ultimately, the pedagogical value of critical thinking lies in its unique capacity to help us understand ourselves and our collective world more deeply than we otherwise would, permanently altering our existential approach to life and enriching our interpersonal relations through a lifelong habit of reflection (Sifuna & Obonyo, 2021).

Though the concerns of critical thinking are deeply abstract, rooted in foundational concepts of logic and metaphysics, they carry immense, indispensable practical value. The genius of CBE is realized when learners develop the capacity to seamlessly translate sophisticated theoretical frameworks into meaningful, ethical action. This pragmatic translation relies on enhanced analytical, critical, evaluative, and interpretive abilities that allow individuals to extract what is central to an issue from a chaotic mass of information. By organizing ideas coherently, learners are no longer paralyzed by complexity; instead, they are empowered with general problem-solving skills that make the pursuit of good reasoning explicitly relevant to the socioeconomic and political progress of Kenyan society (Onderi & Croll, 2018).

On an interpersonal level, critical thinking serves as the ultimate scaffolding for rigorous communicative excellence and intellectual humility. It drastically improves an individual's ability to express oneself clearly, formulating and responding to complex arguments in speech and writing with persuasive power, clear formulations, and apt examples. True critical inquiry requires a profound dialectical or multi-logical capacity, equipping the learner to reconstruct sympathetically and imaginatively the strongest versions of opposing frameworks of thought. In the spirited give-and-take of dialogical discussion, Kenyan students learn to think on their feet, discovering the vital common ground between adversarial positions while synthesizing disparate views into comprehensive, coherent wholes (Waweru, 2022).

Crucially, the practice of critical thinking forces a deep, internal questioning of one's own framework of thought, dismantling the rigid dogmatism that often stifles intellectual growth. It demands a rare intellectual sensitivity that helps one recognize exactly when and in what respect their own views may be incorrect, identifying what must be revised, what must be discarded, and what can be safely retained. This willingness to continuously examine and re-examine ideas that seem obvious is the hallmark of an enlightened mind. It requires the profound courage to utter three subversive words - *"I don't know"* - which signify a genuine desire to learn and expand one's horizons, rather than a permanent state of ignorance or intellectual stagnation (Kieuba, 2020).

Beyond the boundaries of the individual mind, critical thinking acts as a revolutionary engine for institutional transformation and progressive social change. Every societal pillar within Kenya, including our courts, government institutions, schools, and businesses, is merely the tangible product of an underlying way of thinking. By systematically uncovering hidden biases and deep-seated prejudices, critical thinking serves as a liberating path towards absolute freedom from half-truths, systemic deceptions, and propaganda. It unshackles the intellect from perpetual dogmatic slumber, native biases and raw emotional reactions,

allowing citizens to objectively evaluate the structural integrity of public institutions and imagine more just, transparent alternatives (Mwaka et al., 2023).

Ultimately, critical thinking unlocks the true, unfulfilled promise of Competency-Based Education by shifting the focus from *what* to think to *how* to think. This pedagogical evolution ensures that Kenyan youth are not just trained for the workforce, but are profoundly educated for the complexities of modern citizenship. By mastering the delicate balance between rigorous analytical critique and imaginative empathy, learners are prepared to drive national development with both intellectual precision and ethical clarity. Critical thinking therefore stands as the cornerstone of CBE, transforming the educational journey into an enduring quest for truth, self-realization, and societal renewal (Nasongo & Musungu, 2019).

1.6 Essential Characteristics of a Critical Thinker

To realize the transformative potential of Competency-Based Education (CBE) in Kenya, the learner must embody a unique configuration of intellectual virtues that transcend conventional, reactive levels of thought. The bedrock of this cognitive disposition is an unyielding belief in the supremacy of reason as the ultimate beacon of human existence, driving individuals to navigate reality through systematic logic rather than fleeting emotional impulses. This rational grounding fosters a profound diligence in seeking out objective truth, balanced by the highest level of intellectual patience and a rare capacity to tolerate epistemic ambiguity. Rather than fleeing from uncertainty, the critical thinker exhibits the philosophical perseverance and endurance required to pursue complex issues to their ultimate conclusion. This journey is fueled by a profound intellectual courage - a willingness to remain open to novel ideas, actively seeking out alternative worldviews, and enthusiastically expressing original thoughts, even when they directly conflict with previously held dogmas or cultural orthodoxies (Facione, 2020).

Furthermore, the critical thinker operates with a refined evaluative toolkit that transforms raw evidence into structured wisdom. This capacity is demonstrated through an advanced ability to base judgments strictly on empirical data and validated concepts, systematically isolating cognitive errors, rhetorical deceptions, and fallacious reasoning within public or academic discourse. Within the CBE framework, such intellectual rigor manifests as the ability to ask penetrating, thought-provoking questions that dismantle superficial explanations and lay bare the core dynamics of an issue. Far from being a detached academic exercise, this analytical acuity requires learners to maintain a deep, reflective awareness of their own internal thought processes. By cultivating this intimate connection with their personal ideas, thinkers develop the foundational capacity to construct well-ordered, sequential, and logical arguments that resist the sway of passion, ensuring that choices are guided by intellectual merit rather than social conformity (Paul & Elder, 2019).

1.7 Role of Education in the Critical Faculty at Institutions of Higher Learning

To examine the role of education within the architectural framework of higher learning requires an ontological recognition that education is not merely a mechanism for the passive transmission of information, but a fundamental human right that serves as the ultimate engine for human emancipation and societal engineering (Freire, 1970). In its highest philosophical expression, education liberates the individual from the paralyzing fetters of historical ignorance, egocentric tendencies, and dogmatic assumptions, guiding the mind towards the luminous domains of objective rationality and profound self-understanding (Biesta, 2014). It radically transforms human consciousness from a state of unreflective individualism and uncritical mass-thinking into an authentic condition of cognitive autonomy and distinct individuality (Kant, 1784). By doing so, it harmoniously integrates the human agent with the self, nature, and the broader social fabric, serving as an indispensable catalyst for progressive change,

personal self-actualization, and structural reinvention (Dewey, 1916).

When education is explicitly directed towards the cultivation of the critical faculty, it shifts from an industry of rote compliance to a disciplined training of the intellect designed to question authority, deconstruct established social structures, and evaluate truth claims rather than accepting them at face value (McPeck, 1981). This pedagogical orientation cultivates active thinkers capable of sequential reasoning, systematic bias recognition, and independent, ethically sound judgment (Paul & Elder, 2019). Within a Competency-Based Education (CBE) architecture, this rigorous focus serves as the ultimate organizing principle, intentionally sharpening the student's cognitive lens across all learning disciplines (KICD, 2017). By anchoring skills like communication, collaboration, digital literacy, and self-efficacy in this critical foundation, higher education prevents practical competencies from becoming unreflective, mechanical skills, transforming them instead into adaptable intellectual capabilities (Voorhees, 2001).

Furthermore, educating the critical faculty provides learners with the existential capacity to think with grounded, verified reasons, enabling them to pursue realistic aspirations and author a deliberate, respected life path (Siegel, 1888). It rescues the intellect from the vulnerabilities of social manipulation and egocentric prejudices, guiding the mind out of its perpetual dogmatic slumber towards logically precise outcomes (Kant, 1781). This deep cognitive awakening provides immediate, multi-layered benefits to the individual and the state, beginning with the systematic dismantling of deeply entrenched social prejudices (Akala, 2021). Because dogmatic social evils and unexamined historical biases act as chronic barriers to national cohesion, an education anchored in criticality equips minds to replace superstition with logic, thereby reducing intellectual criminality, restoring systemic law and order, and building an ethical, peaceful society (Amunga et al., 2020).

Concurrently, education in the critical faculty serves as the primary medium through which individual talent is authentically nurtured

and realistic dreams are strategically realized (Sternberg, 2003). By expanding a person's cognitive horizons across diverse fields of study, higher education allows the student to move past passive observation to visibly manifest their unique potential within the global marketplace (Sullivan & Downey, 2021). This expansive development directly enhances the foundational competencies of creativity and imagination, opening up new pathways of reflection that encourage learners to think outside traditional frameworks and explore innovative solutions to life's challenges (Lipman, 2003). Crucially, this reflective posture supports a healthier, more deliberate, and productive lifestyle, as choices regarding wellness and personal conduct are filtered through a rigorous process of independent risk calculation (Elder & Paul, 2020).

On a broader macro-economic scale, an education that prioritizes the critical faculty serves as the ultimate driver of academic excellence and national development (Republic of Kenya, 2017). The advanced research, technological breakthroughs, medical innovations, and progressive policies that move a nation forward are the direct fruits of an intellect trained in rigorous critique and experimental inquiry (Dewey, 1938). Educated individuals who possess this analytical capacity contribute meaningfully to every sector of development, ensuring that a country's economic production remains resilient during global market shifts (Mulder, 2017). Through this dynamic innovation ecosystem, higher education transforms abstract cognitive skills into tangible, national prosperity, systematically reducing poverty and expanding human capability (Ministry of Education, 2020).

This intellectual training similarly elevates the competency of citizenship, moving the student from a passive spectator of state mandates to an ethically responsible, critically literate participant in democracy (Freire, 1970). By nurturing rational, judicious thinking, the curriculum empowers learners to systematically question assumptions, interrogate institutional power structures, and evaluate empirical evidence before arriving at civic conclusions (Bailin et al., 1999). Within the CBE framework, this analytical

conditioning fosters a deep sense of national pride and civic responsibility that is contextually rooted rather than blindly nationalistic (KICD, 2017). Consequently, citizens become highly capable of navigating complex socio-political climates, looking past ethnic polarizations to advocate for authentic social justice and national solidarity (Akala, 2021).

In an environment flooded with unverified data, this critical faculty unlocks the deeper channels of knowledge and wisdom, shielding the mind from digital disinformation and manipulation (Nyamosi, 2024). It exposes the learner to global perspectives, inspiring them to invent useful tools and creatively modify their environments to make communities safer, more ethical places to live (Facione, 2011). Furthermore, this rigorous training enhances communication and collaboration by providing students with the exact cognitive skills required to analyze arguments, identify logical fallacies, and listen with genuine epistemic humility (Habermas, 1984). Team dynamics are vastly improved because conflicts are addressed through objective evidence and structured reasoning rather than personal bias or emotional manipulation, turning workspaces into collaborative, problem-solving ecosystems (Ennis, 2015).

This process also strengthens individual self-efficacy, as mastering the analytical tools of inquiry gives learners absolute confidence in their independent judgment and personal agency (Facione, 1998). By learning to systematically deconstruct complex real-world dilemmas, students stop projecting blame onto external factors and start creating real solutions, shifting the locus of control entirely to themselves (Wiggins, 1998). This internal confidence transforms abstract philosophy into lived competence, fulfilling Nelson Mandela's famous insight that *education is the most powerful weapon one can use to change the world* (Amunga et al., 2020). In an era where destructive weaponry is commercialized, global conflicts are common, and human rights are threatened, a critically oriented education stands as the primary asset to protect vulnerable nations and reclaim the sanctity of human decency (Scheffler, 1973).

To achieve this liberating transformation, higher education must intentionally cultivate a specific matrix of skills, dispositions, and attitudes that define a virtue encompassing both intellectual and moral dimensions (Siegel, 1888). This complete cognitive orientation actively prevents the emergence of intellectual vices, such as dogmatism, arrogance, and blind conformity, directly informing the core mechanics of CBE (KICD, 2018). One central purpose of this education is to prepare learners to form reasonable, autonomous judgments on controversial questions where they are eventually required to act (McPeck, 1981). Therefore, a competency-based model must provide impartial access to knowledge while offering rigorous training in judicial habits of thought (Ennis, 2015). Without these targeted skills, acquired data simply produces individuals who passively accept dominant cultural creeds or institutional wisdom without independent evaluation (Bailin et al., 1999).

These essential, knowledge-grounded critical thinking skills require the student to develop the capacity to form opinions independently, see through misleading rhetoric, and continuously ask whether their beliefs are genuinely true (Paul & Elder, 2019). Additionally, it demands the cultivation of skills to find impartial solutions, which requires learners to recognize and actively control their own subjective biases (Facione, 1998). By viewing their own perspectives with the same critical detachment applied to others, students move past simple information retention to embody true intellectual independence (Kant, 1781). This complete alignment of skills and dispositions guarantees that higher education fulfills its progressive promise - producing highly skilled, ethically grounded leaders who can expertly navigate technical landscapes and foster a democratic society (MoE Kenya, 2020).

1.8 Conclusion

The conceptual architecture of Competency-Based Education (CBE) in Kenya can only achieve its liberating and transformative potential by deliberately, strategically, and intentionally elevating critical thinking to the apex of the pedagogical framework (KICD,

2017). As demonstrated through the lenses of Kantian autonomy, Deweyan reflective inquiry, and Habermasian communicative rationality, critical thinking is not merely an isolated skill set but the foundational cognitive crucible that activates, harmonizes, and ethically grounds all other core competencies (Dewey, 1938; Habermas, 1984; Kant, 1784). By shifting the educational locus from the legacy 8-4-4 system's passive, exam-driven rote memorization to a dynamic paradigm of active critique, the curriculum bridges the historic chasm between theory and practice (Akala, 2021; Sullivan & Downey, 2021). When philosophy, operational competencies, and cardinal human values are tightly synthesized through the mechanism of independent thought, education transcends basic technical training to become a transformative cognitive awakening capable of building a balanced, highly skilled, and ethically responsible society (Amunga et al., 2020; Scheffler, 1973).

To actualize this educational vision, particularly within the higher education sector in Kenya, urgent, deliberate, and strategic structural policy interventions are required. First, the Ministry of Education and the Commission for University Education (CUE) must mandate the explicit integration of "Teaching for Critical Thinking" as a foundational, cross-cutting pedagogical methodology across all university degree programs, moving past isolated general options (Nyamosi, 2024). Second, teacher education institutions must radically overhaul their instructor-preparation curricula, training future educators in Deweyan inquiry-based learning, authentic portfolio assessments, and dialogical methods that reward the deconstruction of bias rather than passive compliance (Wiggins, 1998). Third, university grading rubrics must undergo a complete policy shift, replacing high-stakes written examinations with authentic assessments, real-world Community Service Learning (CSL) data, and evidence-based problem-solving portfolios (Facione, 1998). Finally, the state must fund dedicated academic research hubs centered on 21st-century cognitive development to continually align university outputs with evolving technological flows and emerging workforce demands (Republic of Kenya, 2017).

The national benefits resulting from these structured adjustments will profoundly secure Kenya's long-term socioeconomic and civic stability (MoE. Kenya, 2020). By anchoring CBE in the primacy of thought, higher education will produce an adaptive, highly analytical workforce capable of driving tech innovations, modern agriculture, and industrial breakthroughs, thereby accelerating national development and reducing youth unemployment (Miglani et al., 2026; Mulder, 2017). On a civic level, a critically literate population acts as a powerful shield against digital disinformation, political manipulation, and ethnic polarizations, fostering deep social cohesion and an enduring sense of contextually rooted national pride (KICD, 2017). Ultimately, by cultivating self-legislating, autonomous individuals who trust in reason and practice epistemic humility, Kenya will firmly secure its democratic principles, uphold the rule of law, and honor education as a liberating human right (Freire, 1970; Siegel, 1988).

To fully realize critical thinking as the overarching umbrella competence within Competency-Based Education (CBE), higher education must aggressively move past safe, domesticated intellectual exercises and instead lean directly into the radical, disruptive mechanics of *pedagogical provocation* (Biesta, 2014). This approach acknowledges a harsh but necessary reality: *the human mind does not naturally gravitate toward critical self-correction; rather, it inherently favors the comfort of its own pre-existing cognitive tracks, unexamined cultural scripts, and native egocentrism* (Paul & Elder, 2019). Genuine, deep-seated reflection is never birthed in a state of passive equilibrium. As John Dewey insightfully observed, *authentic thought is strictly an adversarial event, violently sparked only when the mind encounters an obstacle – a painful state of perplexity, structural doubt, or an existential "forked-road situation" that shatters habitual assumptions and demands cognitive re-engineering* (Dewey, 1910).

Within a philosophically robust CBE framework, *critical thinking provocation acts as the strategic, and deliberate injection of rational friction into the educational ecosystem* (Lipman, 2003). It is the intentional curation of a productive cognitive crisis, executed by

presenting learners with profoundly destabilizing real-world dilemmas, counter-intuitive data matrices, and raw, conflicting historical perspectives (Facione, 2011). This calculated destabilization strips away the comfort of face-value metrics and easy answers. *It explicitly forces the learner into a state of intellectual heteronomy where they must choose between two paths: retreating into defensive dogmatism, or summoning the cognitive courage required to systematically unpack their own biases* (Siegel, 1988). By shifting the focus of the classroom from the validation of personal feelings to the rigorous interrogation of truth claims, provocation fundamentally reconstructs the student's epistemic identity (McPeck, 1981).

Consequently, by treating intellectual provocation as a primary pedagogical mechanism, educational architects protect the competency-based curriculum from collapsing into a safe, mechanical checklist of sterile vocational skills (Voorhees, 2001). *Provocation transforms critical thinking from a dry, clinical procedure into a fiery, emancipatory tool of inquiry that directly mirrors the messy, non-linear realities of a society in flux* (Freire, 1970). It teaches students to embrace structural ambiguity and look at doubt not as an intellectual failure, but as a vital, productive phase of rational discovery (Strohm & Baukus, 1995). Ultimately, this provocative friction ensures that *when Kenyan graduates exit higher education, they do not leave as passive compliance units holding rigid certificates. Instead, they emerge as self-regulating, autonomous intellectual agents equipped with the psychological stamina and critical foresight to reconstruct their communities, defend human rights, be solutions to the ever emerging problems and challenges, create global harmony and understanding, drive national and global progress under pressure, and make the world a better place to be* (Akala, 2021; KICD, 2017). We can save the world through education in the critical faculty.

1.9 Bibliography/References

- Akala, B. M. (2021). Revisiting education reform in Kenya: A case of Competency Based Curriculum (CBC). *Journal of Research in International Education*, 20(1), 34–48.
- Amunga, J., Were, D., & Ashioya, A. (2020). The teacher-parent nexus in Competency Based Curriculum success equation in Kenya. *International Journal of Educational Administration and Policy Studies*, 12(1), 60–76.
- Amunga, J., Amadalo, M. M., & Maiyo, J. K. (2022). Philosophical Foundations of the Competency-Based Curriculum in Kenya: A Critical Reflection. *Journal of Educational Research*, 10(2), 45–58.
- Bailin, S., Case, R., Coombs, J. R., & Daniels, L. B. (1999). Conceptualizing Critical Thinking. *Journal of Curriculum Studies*, 31(3), 285–302.
- Biesta, G. J. (2014). Pragmatism and the Philosophical Foundations of Education Research. In A. D. Reid, E. P. Hart, & M. A. Peters (Eds.), *Companion to research in education* (pp. 129–137). Springer.
- Dewey, J. (1910). *How we think*. D.C. Heath & Co.
- Dewey, J. (1938). *Experience and Education*. Kappa Delta Pi.
- Elder, L., & Paul, R. (2020). *Critical Thinking: Tools For Taking Charge Of Your Learning And Your Life* (3rd Ed.). Foundation for Critical Thinking.
- Ennis, R. H. (2015). Critical Thinking: A Streamlined Conception. In M. Davies & R. Barnett (Eds.), *The Palgrave handbook of critical thinking in higher education* (pp. 31–47). Palgrave Macmillan.
- Facione, P. A. (2011). *Critical Thinking: What It Is and Why It Counts*. Measured Reasons LLC.
- Facione, P. A. (1998). *Critical Thinking: What It Is and Why It Counts*. California Academic Press.

- Habermas, J. (1984). *The Theory of Communicative Action: Vol. 1. Reason and the Rationalization of Society* (T. McCarthy, Trans.). Beacon Press.
- Inyega, H. N., Mahiri, J., & Ondigi, S. (2023). A Critical Review of the Challenges Facing the Competency-Based Assessments in Nairobi County, Kenya. *Educational Studies Review*, 14(1), 12-27.
- Kant, I. (1784). *Answering The Question: What Is Enlightenment?* *Berlinische Monatsschrift*, 4, 481–494.
- Kenya Institute of Curriculum Development [KICD]. (2017). *Basic education curriculum framework*. Government Printer.
- Kieuba, J. M. (2020). *Epistemological Shifts in Modern Pedagogy: Nurturing the Critical Mind in African Education*. East African Educational Publishers.
- Lipman, M. (2003). *Thinking In Education* (2nd Ed.). Cambridge University Press.
- MCC General Education Initiative. (1995). *General Education Core Competencies and Assessment Indicators*. Middlesex Community College.
- McPeck, J. E. (1981). *Critical Thinking and Education*. Martin Robertson.
- Miglani, A., Awuor, E., & Omondi, P. (2026). Epistemological Shifts in East African Schooling: Deconstructing Seat-Time Metrics in Competency-Based Models. *African Journal of Education and Technology*, 16(1), 12–29.
- Ministry of Education. (2020). *Guidelines for Implementation of Competency Based Curriculum in Basic Education Institutions*. Republic of Kenya.
- Momanyi, J. M., & Rop, P. K. (2020). Emerging Issues of Transition in Education in Kenya: From 8-4-4 to CBC. *International Journal of Creative Research*, 8(5), 1358-1372.

- Mulder, M. (Ed.). (2017). *Competence-Based Vocational and Professional Education: Bridging the Worlds of Work and Education*. Springer.
- Mwaka, M., Nabwire, V. K., & Musamas, J. (2023). Transforming Society Through Curriculum Reforms: Evaluating The Critical Thinking Component in Kenya's Competency-Based Education. *East African Journal of Education Studies*, 6(2), 112–125. doi.org
- Mulder, M. (2017). *Competency-Based Education in the 21st Century: Evolution and Challenges*. Springer.
- Nasongo, J. W., & Musungu, L. L. (2019). The Philosophical Foundations of Competency-Based Curriculum in Kenya: A Critical Appraisal. *International Journal of Academic Research in Business and Social Sciences*, 9(11), 320–333. doi.org
- Nyamosi, G. (2024). Selected Teacher Competencies that can Enhance CBC Implementation in Kenya. *European Journal of Contemporary Education and E-Learning*, 2(6), 250–258. <https://doi.org>
- Onderi, H., & Croll, P. (2018). Thinking through Problems: Practical Applications of Critical Cognition in Emerging Educational Frameworks. *Kenya Journal of Educational Planning*, 12(1), 45–59.
- Paul, R., & Elder, L. (2019). *The Miniature Guide to Critical Thinking Concepts and Tools* (8th Ed.). Rowman & Littlefield.
- Republic of Kenya. (2017). Sessional Paper No. 1 of 2017 on Policy Framework for Reforming Education and Training in Kenya. Government Printer.
- Scheffler, I. (1973). *Reason and Teaching*. Routledge & Kegan Paul.
- Siegel, H. (1888). *Educating Reason: Rationality, Critical Thinking, and Education*. Routledge.

- Sifuna, D. N., & Obonyo, M. M. (2021). Competency-Based Curriculum in Primary Schools in Kenya: Prospects and Challenges of Implementation. *Journal of Education and Practice*, 12(3), 88–101.
- Sullivan, S., & Downey, J. A. (2021). Shifting Paradigms: The Foundational Mechanics of Competency-Based Systems. *Journal of Competency-Based Education*, 6(2), e1241.
- Strohm, S. M., & Baukus, E. C. (1995). Strategies for Fostering Critical Thinking Skills. *Journalism & Mass Communication Educator*, 50(1), 55–62.
- Surr, W., & Redding, S. (2017). The Competency-Based Education Framework: Component Design and Learner Tracking. Center on Innovations in Learning.
- Voorhees, R. A. (2001). Competency-Based Learning Models: A Strategy for the 21st Century. *New Directions for Institutional Research*, 2001(110), 5–13.
- Walde, P. (1995). Characteristics of Critical Thinking in Competency-Based Frameworks. *Journal of Curriculum and Supervision*, 11(2), 142–156.
- Wanjohi, A. M. (2017). Critical Review Of the 8-4-4 Education System and the Birth of CBC in Kenya. *Schools. Net Kenya*
- Waweru, J. W. (2022). Dialogical Education and Communicative Competence: Unlocking Learner Capabilities in the 21st Century. *African Journal of Theory and Practice in Education*, 7(4), 15–29.
- Wiggins, G. (1998). *Educative Assessment: Designing Assessments to Inform and Improve Student Performance*. Jossey-Bass.

