Critical Thinking: Strategies for Fostering a Culture of Inquiry in Education

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Abstract. This study investigates the role of critical thinking in fostering a culture of inquiry in education. In today's world, where creativity and innovation are increasingly vital, educational institutions face the challenge of producing graduates who can meet the competitive and demanding job market. It is essential to understand that critical thinking and inquiry strategies are interdependent; critical thinking enhances inquiry, and inquiry stimulates a critical mindset. The study employs the Socratic questioning approach, highlighting benefits such as increased curiosity, improved job effectiveness, enhanced student self-awareness, and innovation and problem-solving skills. Successfully integrating critical thinking into curricula, teaching practices, and assessment methods requires a concerted effort from all educational stakeholders. Therefore, the paper advocates for a systematic approach to incorporating inquiry-based practices in academic institutions, preparing students for the complexities of the modern world and promoting lifelong learning and adaptability.

Keywords: Critical Thinking; Culture of Enquiry; Socratic questioning; Education.

INTRODUCTION

The role of critical thinking cannot be over-emphasised both within our educational setting and beyond, as it can be pivotal towards problem-solving, decision-making, and rational thinking [1, 2]. The significance of critical thinking has necessitated the need for its encouragement and development in educational institutions, considering that these skills could be developed through an enquiry-based education. An enquiry-based education allows students to question existing theories, knowledge, and information received instead of indoctrination- mindless memorisation without critical thinking, analysis, or evaluation [3]. The culture of inquiry extends beyond merely asking questions to develop a customary practice of questioning. This educational strategy is not a new concept, as it has historical roots dating back to the time of Socrates. Socrates promoted an academic approach that challenged existing beliefs, theories, and assumptions, laying the groundwork for fostering critical thinking through what is now known as "Socratic questioning." Many philosophers, including Plato, Aristotle, and Pythagoras, embraced this method of inquiry-based education. Notably, Plato, a direct disciple of Socrates, founded Plato's Academy, which many consider the first university in the world.

The need for critical thinking has increased in the 21st century, which is marked as an era of information, and the degree of competitiveness at all levels of the organisation, from the individual to the international level, is high. Thus, education should be designed to develop problem-solving skills among students of educational institutions [4]. This skill would ensure that graduates from academic institutions are equipped to meet the demands of problem-solving and competitiveness in the global economic market. It would also aid in their rational analysis of information, evaluation of different perspectives, and making informed decisions.

Critical thinking is fundamental to innovation and creativity, an essential skill in today's world. Edutopia [5] highlights that the process of inquiry, marked by continuous questioning and idea refinement, dramatically enhances students' logical and creative thinking abilities. Given the importance of creativity and innovation, fostering critical thinking early is crucial to support children's cognitive development [6]. Developing critical thinking in children necessitates a shift from teacher-centred education to student-

centred learning through an inquiry-based approach. This approach relies on educators acting as facilitators rather than traditional authoritative figures, guiding students through the inquiry process and providing resources, support, and feedback while allowing students to take charge of their learning.

Despite its numerous advantages, critical thinking has only recently received significant attention, particularly in Western education [6]. It is essential to recognise that critical thinking influences the inquiry strategy, while the inquiry strategy also stimulates a critical mindset, demonstrating the interdependence of these two concepts. This study explores the importance of critical thinking in fostering a culture of inquiry in education.

Concept of Critical Thinking. The concept of critical thinking has been defined in various ways. Critical thinking is the ability to rationally analyse and evaluate information to form sound judgments [7, 8]. It is the foundation for effective learning, decision-making, and lifelong intellectual growth. Several scholars reference UNESCO's definition of critical thinking as a form of creative thinking that fosters innovation and enables knowledge sharing, which is essential for achieving sustainable development goals and, therefore, should be prioritised by educational institutions [9-13]. Reaching a consensus on a universally acceptable definition of critical thinking has been challenging. However, a widely cited definition that holds significant relevance describes critical thinking as "purposeful, self-regulating judgment that results in interpretation, analysis, evaluation, and conclusion, as well as an explanation of the evidential, conceptual, methodological, critical, or contextual considerations on which that judgment is based. Critical thinking is essential as a tool of inquiry. As such, critical thinking is a liberating force in education and a powerful resource in personal and civic life" [14 p. 651]. The emphasis on it being a tool of inquiry underscores its importance in educational institutions.

Although critical thinking might be challenging to assess, some aspects of it can be measured. These include the following skills:

a) In-depth understanding and interpretation of information;
b) Analysing information through the evaluation of arguments for and against, scrutinising the validity of the conclusions;
c) Making inferences through the checking of reliability and potential adverse outcomes of conclusion;
d) Assessing its credibility and the trustworthiness of its source;
e) Summarising findings, interpreting the information, and verifying reasoning;
f) Evaluate the methods' effectiveness, resolve conflicts between different conclusions, clarify conclusions, and identify missing elements [4].

Critical Thinking as a Culture of Inquiry in Education. In today's information age, the necessity for critical thinking skills has never been more evident, given the vast amount of data and the rapid dissemination of knowledge through the digital world in addressing educational challenges [15]. Information is readily available to students, but they often lack the skills to assess its credibility, evaluate arguments, and make informed decisions within educational settings [16]. The need for critical thinking in our modern world has brought about the definition of a critical thinker' by the American Philosophical Association to mind which they noted as a person who is flexible, curious, open to new ideas, adaptable, fair, and knowledgeable, thus possessing an attribute of being able to understand various points of view and perspectives [4]. These skills underscore the importance of critical thinking in problem-solving, accentuating their importance within and beyond the boundaries of educational institutions.

Within the educational context, critical thinking is widely recognised as a vital skill for effective learning [17]. The advantage associated with essential thinking aligns with the goals of education, which is to serve as the process that fosters human development. Throughout history, a significant strand of educational thought has maintained that the primary objective of schools should be to enhance children's thinking abilities rather than treating this as a secondary outcome [18]. Thus, the strategy of inquiry should be encouraged in educational institutions to enable students to reap the maximum benefits of education, as the lack of critical thinking can be costly, as well as have adverse effects on real-life situations, impacting not only academic performance but also professional competence and civic engagement [19]. Therefore, the strategy of enquiring represents a solution that can combat the deficiency of critical thinking in educational institutions and eliminate indoctrination from the edu-

cational system. Critical thinking has ancient origins, with early philosophers like Socrates emphasising the importance of questioning in fostering critical thinking. Socrates aimed to challenge existing belief systems, distinguishing between reasonable and logical beliefs and those that lack sufficient evidence or rational grounding despite their appeal to our natural egocentrism. By the 20th century, critical thinking had expanded beyond the boundaries of education, cementing its place as an essential component in all spectra of life [17]. In the modern era, with the fusion of scientific methods and philosophy, critical thinking has become a more pressing educational objective in our formal education [19].

A culture of inquiry in education describes a learning environment that encourages and stimulates students to have an in-depth understanding of topics; this will aid in their logical addressing of issues by asking the right questions and seeking clarification to gain a clear understanding of problems that may arise [20]. This culture involves encouraging and supporting students' questions, valuing inquiries from everyone, and fostering critical investigations that enhance learning and development. Integrating an inquiry-based teaching approach into the educational system is essential for creating a vital learning environment. Critical thinking is pivotal in education, as it helps students reason and analyse information [21].

Furthermore, education should provide a platform that supports constructive arguments while developing problem-solving strategies among students, encouraging them to address academic challenges independently and use these experiences in tackling life issues. Therefore, it is safe to say that critical thinking prepares students for real-world problems and supports their future endeavours and their independent research efforts, which is a vital tool for advancing science and technology. Critical thinking equips students with essential skills for their lifelong journey [20].

RESULTS AND DISCUSSION

Types of Critical Thinking Skills

Convergent Analytical Thinking. Convergent thinking involves generating the best possible answers to a specific question through logical reasoning. While this skill does not rely on major creative strategies, it is not well-suited for tackling complex problems. Convergent thinking typically employs standardised tests or a range of varied assessments. According to Drew [1], this approach evaluates our ability to address more straightforward problems using logic, speed, and accuracy.

Divergent Thinking. Divergent thinking involves developing various new and varied ideas for an issue or problem. For example, when deciding between two career paths, such as becoming a lawyer or a journalist, one might consider both options as potential routes to a successful future, regardless of their proficiency in either field. This process creates divergent ideas about which option might be best. To address this complex decision, one should analyse each career choice by listing the advantages and disadvantages of both paths. This approach provides clarity and helps determine the most suitable option [22].

Creative Thinking. Creative thinking is an innovative approach to solving or addressing specific life situations. It involves abstract thinking that differs from conventional options to generate new ideas about an established topic. This type of thinking has led to the advancements and developments that characterise the modern world we enjoy today [1].

Importance of Critical Thinking to Education

Critical thinking presents several educational benefits, especially in a system that encourages an open-minded approach. The aim of teaching in such a system is usually focused on teaching students how to think rather than dictating what they should think. Scholars have identified several reasons why critical thinking should be promoted in schools. Critical thinking is crucial in education because it fosters independent thought, enhances problem-solving abilities, encourages creativity, and prepares students for real-world challenges [23]. Other importance of critical thinking in education is as follows:

Encouraging students' self-awareness and self-reflection: The foundational elements of critical thinking skills include self-monitoring, self-discipline, and creative thinking. This skill set helps students understand and make sense of things based on their observations and judgments. It builds confidence and assurance in their cognitive processes and outcomes. By learning to reflect on and learn from their mistakes, students gain valuable assets that benefit their personal and professional lives [23].

Improved Job effectiveness: Critical thinking also demands creativity and innovation, which are essential for making significant contributions to employers after graduation. In today's information age, there is a high demand for a flexible workforce capable of analysing data from diverse sources and devising creative solutions. Critical thinking improves job performance, and in a rapidly evolving work environment, individuals with strong critical thinking skills are highly valued [24].

Increase curiosity and creativity: Curiosity has long been recognised as the bedrock for invention. When students are trained in critical thinking, they develop an intense curiosity about their surroundings. This curiosity drives them to evaluate and process information and experiences. As a result, they generate unique, creative ideas. A student with critical thinking skills can ask insightful questions, efficiently gather relevant details, and creatively organise the information gathered to reach a more reliable and trustworthy conclusion [25].

Fostering innovation and problem-solving skills: The ability to analyse and approach issues creatively and effectively is a crucial outcome of critical thinking skills. Critical thinkers are often effective problem solvers. They can differentiate between facts, opinions, and fiction and evaluate issues from multiple perspectives before making informed decisions. They can also develop unbiased solutions, which is crucial in the workplace. As global challenges such as climate change, pollution, and pandemics increasingly impact the world, today's youth – who will become tomorrow's leaders – are expected to find practical solutions. Critical thinkers are likely to devise innovative and sustainable answers [26].

Developing related life skills: Critical thinking is a life skill that enables overcoming challenges in both private and professional lives. Organisation, planning, open-mindedness, and communication are just a few life skills that critical thinking encourages. It promotes self-confidence as well as independence, which leads to successful lives. Individuals will learn from their mistakes, boosting their output in all aspects of their lives [26].

Strategies Employ in Fostering Critical Thinking

Socrates questioning. As mentioned earlier, enquiry is one of the essential strategies in developing a critical mind, and the method was named after the Greek philosopher Socrates; this method guides students towards deeper reflection and analytical approaches [24]. Socratic questioning is a technique used to foster critical thinking by asking a series of questions that challenge assumptions and concepts and seeking evidence to support a point. It enables individuals to scrutinise and evaluate their own and the thinking of others, which can be achieved through posing thoughtful and provocative questions, which helps the student to identify biases and explore alternative perspectives [27].

The method is most effective when teachers encourage students to generate their questions rather than just answering the teacher's questions [28]. This approach helps students develop a deeper understanding of subjects through research and inquiry, reducing their reliance on pre-determined solutions [29]. A culture of inquiry, when developed, would aid students in becoming proficient in critical thinking, leading to effective problem-solving strategies [24]. The effectiveness of this strategy is as follows:

1) Encouragement of open-ended questions. Promoting open-ended questions and discussions are essential strategies for cultivating a culture of inquiry and critical thinking in education. Unlike closed questions with a single correct answer, open-ended questions require students to think deeply and critically. These questions encourage students to explore different possibilities, make connections, and reflect on their understanding, leading to deeper engagement with the subject [30]. It stimulates deeper thinking by prompting students to explore multiple perspectives and engage in problem-solving rather than merely recalling facts. This approach nurtures curiosity, promotes intellectual engagement, and develops critical thinking skills. Chin and Osborne [31] corroborate that effective questioning techniques involve asking questions that require students to explain their thought processes, justify their answers, and connect ideas. This method enhances comprehension and promotes a classroom environment where inquiry and critical thinking are valued and encouraged. By incorporating open-ended questions and fostering rich discussions, educators can create a dynamic learning environment that supports the development of critical thinking and inquiry skills.

Discussions initiated by these questions help students articulate their reasoning, challenge assumptions, and consider alternative viewpoints

[32]. It is crucial for developing higher-order thinking skills and a deeper understanding of the subject matter. More so in a specific term, discussions resulting from open-ended questions enable a collaborative learning environment where students can share their diverse viewpoints and further challenge each other's thinking. This educational approach is essential for fostering critical thinking skills and refining their thoughts, which would aid in a sophisticated understanding of the subject matter.

Brookfield and Preskill shed more light as they bolstered the significance of discussion in ensuring critical thinking [32]. They highlighted that discussions play a pivotal role in fostering a culture of critical thinking as students become more adept at questioning assumptions, evaluating evidence, and synthesising information from multiple sources. This interactive process enhances individual understanding and builds a community of inquiry where critical thinking is a shared value.

To effectively integrate open-ended questions and discussions into the classroom, educators need to create an environment that encourages risk-taking and values diverse perspectives; this can be achieved by enhancing critical thinking through questioning and discussion techniques and, hence, providing structured opportunities for students to engage in group discussion.

2) Project-Based Learning. This learning approach serves to stimulate critical thinking through the provision of an engaging classroom where students are tasked with proffering solutions to a real-world challenge over an extended period. The first stage involves educators developing open-ended questions that encouraging deep inquiry, guiding students in their projects. Planning is another crucial stage where students set goals and timelines and identify resources, with significant support from educators, to ensure feasibility and alignment with learning objectives. During project execution, students conduct their projects through research, experimentation, and problem-solving, considering their goals, timelines, and available resources.

Countries that embraced critical thinking as a culture of inquiry in education

Finland encourages inquiry-based learning and student-centred approaches in its educational settings as part of its benefits and innovative approaches. Singapore's education system also emphasises critical thinking and a culture of inquiry-based learning in its national curriculum [33]. Canada, aiming to promote its educational standards, prioritises crucial thinking as the foundation for creativity and problem-solving, with a culture of inquiry being central to its national learning framework as supported by the Council of Ministers [34]. Australia's curriculum also adopts an inquiry-based culture to gain more knowledge and critical thinking in tackling complex problems [35]. New Zealand's education authority now focuses on student-centred learning and a culture of inquiry, thereby encouraging the thinking ability of its students [36]. Critical thinking has immensely helped this country improve its educational system. These countries have implemented diverse initiatives and reforms to sustain a culture of inquiry in their educational system by preparing students for success in handling increasingly complex challenges and a rapidly changing world.

CONCLUSIONS

Integrating critical thinking into educational frameworks is fundamental in nurturing a culture of inquiry that empowers learners to become independent, reflective, and engaged participants in their learning processes. This study has explored various dimensions of how critical thinking can be systematically incorporated into educational settings to cultivate an environment where questioning, exploration, and evidence-based reasoning are paramount. Critical thinking encourages students to move beyond passive reception of information, fostering active engagement and ownership of their learning journey. When students are trained to question assumptions, evaluate evidence, and synthesise information from diverse sources, they develop a deeper understanding of the subject matter. This shift from rote memorisation to analytical thinking enhances academic performance and prepares students for complex problem-solving in real-world contexts.

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