

Harnessing Artificial Intelligence to Foster Critical Thinking in Zimbabwean Tertiary Education

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ABSTRACT

Artificial intelligence (AI) is reshaping educational strategies worldwide, with growing interest in its potential to cultivate critical thinking among students. Yet, limited research explores this within African higher education contexts. This study investigates how tertiary educators in three Zimbabwean institutions understand and implement AI tools to enhance critical thinking. Rooted in the interpretivist paradigm, the study employs qualitative methods, including semi-structured interviews and open-ended surveys, to capture educators' perceptions, strategies, and the challenges they encounter. Thematic analysis reveals that AI's effect on student thinking in Zimbabwean universities depends entirely on how lecturers use it. The critical thinking aspect emerged when lecturers required students to critique the ideas that they obtained through AI. Findings indicate that students were encouraged to compare AI outputs with credible sources, forcing them to evaluate authority, accuracy, and bias. Some lecturers failed to guide students on how to utilize AI effectively. Students without clear structure developed a complicated reliance on AI by failing to think for themselves. Lecturers observed a necessary shift in their own teaching and the students' cognitive roles. Most of them suggested that since AI is responsible for basic summarisation and information retrieval, classroom discussions could focus on application, analysis, and creation as indicated in the higher levels of Bloom's Taxonomy. Participants proposed capacity-building, contextualized digital content, and institutional support as key enablers. These findings highlight the promise of AI in advancing critical thinking but call for targeted interventions to realize its full potential. The study contributes valuable insights for policymakers, educators, and curriculum designers aiming to integrate AI in meaningful and sustainable ways.

Key words: Artificial intelligence, Higher education, Critical thinking, Pedagogical and Andragogical Approaches

INTRODUCTION

Critical thinking which is the ability to analyse, evaluate and synthesize information to form a reasoned judgement, is a cornerstone of tertiary education (Facione, 2023). In the context of Zimbabwe's evolving higher education landscape, which aims to produce graduates capable of solving complex local and global problems, fostering this skill is paramount. Some conversations done internationally point to AI as a digital entity meant to facilitate and improve learning. Lin et al. (2023) noted that Intelligent tutoring can offer personalized feedback and guidance, helping students to master complex concepts at their own pace. However, AI seems to be received with mixed feelings especially in higher and tertiary education institutions in Zimbabwe. One major concern with AI is the potential for decreased critical thinking skills among students (Shamsuddinova et al., 2024; Obenza et al., 2024). The advent of sophisticated, generative AI tools like ChatGPT presents both a challenge and an unprecedented opportunity. While concerns about plagiarism and the passive consumption of AI-generated content are valid, a growing body of thought suggests that AI could be leveraged to deepen, rather than diminish, critical engagement (Selwyn, 2022).

Zawacki-Richter et al. (2019) noted that although AI has the potential to transform higher education, careful implementation and consideration of ethical implications are important for maximum benefits. It is important to

educate students about the ethical use of AI and the consequences of academic misconduct (Khlaif et al., 2024). AI which is described as the ability of a machine or computer system to simulate and perform tasks like logical reasoning, logic and problem solving which ordinarily demand human intellect (Morandin-Ahuerma, 2022) systems can adapt to individual student learning styles, needs and paces, offering customized educational content and support (Crain et al., 2024).

Statement of the Problem

Artificial intelligence (AI) is reshaping educational strategies worldwide, with growing interest in its potential to cultivate critical thinking among students. The increasing reliance on Artificial Intelligence (AI) tools in Zimbabwe tertiary education seems to raise concerns about the potential impact on critical thinking among students. Yet, limited research explores this within African higher education contexts. This article argues that to understand this complex interplay, a methodological approach that captures rich, contextual insights is necessary in order to answer the primary question namely, How do lecturers perceive the role of AI in developing critical thinking skills among their students?

Research questions

The following research questions guided this study

How are AI tools implemented by tertiary educators to enhance critical thinking?

What challenges are encountered in utilising AI at tertiary education?

How can AI be sustainably integrated to enhance the development of critical thinking amongst learners in Zimbabwean tertiary education?

RELATED LITERATURE REVIEW

Existing literature on AI in education often focuses on its functionality as a tutoring system or its threat to academic integrity (Zawacki-Richter et al., 2019). Its role as a provocateur for critical thought is less explored. Philosophically, the Socratic method relies on questioning to stimulate critical thinking. Modern educators have drawn parallels, suggesting that AI can act as a “Socratic opponent,” generating arguments that students must deconstruct (Kahneman, 2018). This positions the student not as a passive recipient of information, but as an active critic. Furthermore, the concept of “critical digital pedagogy” advocates for using technology in a way that empowers learners to question the tools they use, including their biases and limitations (Stommel, 2021). This review identifies a gap in context-specific, qualitative studies within the Global South, particularly Zimbabwe, exploring these pedagogical dynamics.

Some authors have argued that AI can support inquiry -based learning by adapting to individual student needs and promoting deeper engagement (Luckin et al. 2016). Garg et al. (2025) highlight that the integration of AI enhances Augmented reality (AR) by making learning more inclusive, student centred and efficient, particularly beneficial for learners with diverse needs and learning paces. According to the survey by Babu et al. (2024), 43% of college students reported using artificial intelligence tools like ChatGPT, half of the students rely on these tools to complete projects while 20% acknowledged using A.I to finish their school assignments. This shows that artificial intelligence in education is already in use, even though its acknowledgement is not quite clear in the education system. Following the public release of ChatGPT, many universities initially adopted a cautious, wait and see approach with concerns about ethics, accuracy and privacy, Wang et al., (2023). It is however noted that academic integrity and misuse of AI tools raises concerns on academic honesty (Cotton et al.,2023). Notable, Kasneci et al., (2023) suggest that heavy dependence on AI can reduce students’ independent analytic skills.

It should be noted that AI can produce plausible but incorrect claims and reflect underlying biases (Dwivedi et al., 2021). However, artificial intelligence tools (e.g., ChatGPT and Midjourney) have become increasingly accessible to students. Therefore, the necessity for well- defined guidelines and policies has become apparent.

The potential of Generative AI (like ChatGPT) to improve creativity and critical thinking is a bone of contention (Dwivedi, et.al. 2023). Some authors such as Casal Otero et al (2023) explored how AI can be integrated into teaching methodologies to foster not just knowledge acquisition but also critical thinking, creativity and problem-solving skills. The study identified that A-driven adaptive learning systems (for example intelligent tutoring systems) can analyse a student's performance and tailor content to their specific level and needs (Personalised Learning Paths). This enabled students to tackle challenges that are appropriately difficult which is essential for developing problem-solving skills. In addition, the results indicated that AI tools like generative AI (For example., for writing, art music) and AI-powered simulations that allow students to experiment with ideas in a risk-free environment and generate initial prototypes or concepts which they can critique, refine, and build upon hence improving their creativity and innovative thinking.

However, AI seems to be received with mixed feelings especially in higher and tertiary education institutions in Zimbabwe. One major concern with AI is the potential for decreased critical thinking skills among students (Shamsuddinova et al., 2024; Obenza et al., 2024). Over reliance on AI tools may lead to decline in students' ability to analyze information, solve problems independently, and think creatively (Giray, 2024). Different perceptions about AI might cause variances in its integration in the education system. Zawacki-Richter et al. (2019) noted that while AI has the potential to transform higher education, careful implementation and consideration of ethical implications are important for maximum benefits. It is important to educate students about the ethical use of AI and the consequences of academic misconduct (Khlaif et al., 2024).

On a different note, Plata et al (2023) examined academic integrity articles and policies at leading global universities, suggesting a model for maintaining academic integrity in the artificial intelligence era. Issues of plagiarism take precedence and make AI to be viewed as a tool of cheating rather than learning. While studies have been conducted to explore policies in relation to the adoption of artificial intelligence in education, its integration in teaching and learning has not been clear. Prior studies have predominantly focused on universities in the wealthier, industrialized countries, leaving out developing and under developed countries.

AI which is described as the ability of a machine or computer system to simulate and perform tasks like logical reasoning, logic and problem solving which ordinarily demand human intellect (Morandin-Ahuerma, 2024) systems can adapt to individual student learning styles, needs and paces, offering customized educational content and support (Crain et al., 2024). Some studies focusing on Zimbabwean education suggest that AI-driven applications can strengthen teaching by providing interactive content and adaptive learning opportunities, though challenges such as connectivity, teacher training, and infrastructure persist (Mandina & Kusakara., 2025). The use of process-focused assessments which requires demonstration of thinking is advocated for by Cotton et al., (2023).

Theoretical Framework

The study is informed by constructivism (Piaget, 1896-1980., Vygotsky, 1896-1934) which views learning as an active process where learners construct new knowledge based on their experiences. In relationship to Vygotsky's thinking AI can act as a tutor or resource that scaffolds learning within the student's Zone of Proximal Development (ZPD). Vygotsky emphasises on social interaction by indicating that through collaboration, discussion, and negotiations with peers and teachers, learners are exposed to multiple perspectives which challenges their thinking. This theory sees the teacher's role changing from being a transmitter of knowledge to a guide, coach and facilitator of learning. According to Vygotsky (1978) teachers design engaging experiences, provide resources, ask probing questions, and scaffold learning to support students in their own knowledge construction.

The sociocultural theory (Vygotsky, 1896-1934) is an influential theory of human development and learning. The theory advocates that higher order mental processes like problem solving and logical reasoning first occur between people in social settings hence social interaction is the foundation of learning. Every function in the child's cultural development appears twice, thus first on the social level and later on the individual level (Vygotsky, 1978). The More Knowledge Other (MKO) which refers to anyone who had a better understanding of a particular task can guide the learner. The ZPD which is the difference between what a learner can do without

help and what they can achieve with guidance and encouragement from a skilled partner is Vygotsky's famous concept.

RESEARCH METHODOLOGY

This study is firmly rooted in the interpretivist paradigm. We sought to understand the subjective realities and shared meanings that lecturers construct around AI's impact on student learning. The paradigm contends that social reality is subjective and constructed through the meanings that people assign to their experiences (Creswell, 2018). Interpretivist paradigm promotes researcher reflexivity, fosters awareness of personal biases and ensures that participants' voices are authentically represented (Sharma et al., 2023). A qualitative multiple case study design (Yin, 2018) that is ideal for investigating how tertiary educators understand and implement AI tools to enhance critical thinking was employed. This design facilitates a comprehensive understanding of the multifaceted phenomenon under investigation, moving beyond simple descriptions to uncover new insights and understandings (Annamalah, 2024). Three Zimbabwean Universities namely—a conventional state university, a state university which offers open and distance learning and a private university—served as individual cases, enabling cross-case analysis and the identification of patterns unique to different institutional cultures. Surveys were administered to six lecturers per institution.

Data Collection Three lecturers per institution were involved in semi-structured interviews whilst open-ended surveys were administered to 6 lecturers from each university as follows

1. **Semi-structured interviews:** In-depth interviews were conducted with 9 lecturers (3 from each institution). The interview guide explored prompts like, "Can you describe an instance where a student's use of AI led to a surprising depth of analysis?" and "What challenges have you observed in students' critical engagement with AI-generated content?"
2. **Open-ended surveys:** An online survey with open-ended questions was distributed, receiving responses from 18 additional lecturers, that is 6 from each university. This allowed for the inclusion of broader perspectives as well as triangulation of data, methods and sources.

Data Analysis

All interviews were transcribed verbatim. Survey responses were compiled into a single document. The thematic analysis that follows the six-phase process outlined by Braun and Clarke (2006), was employed. This involved familiarisation with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report. This iterative process ensured that the findings emerged directly from the rich qualitative data.

FINDINGS AND DISCUSSION

The analysis yielded four central themes that illustrate the multifaceted role of AI in developing critical thinking.

Theme 1: AI as a Critical Argumentative Dialogue

Lecturers consistently reported that students were using AI to generate initial drafts or arguments. However, the critical thinking aspect emerged when lecturers required students to critique the ideas that they obtained through AI. One lecturer from a conventional state university stated:

"I ask them to submit the AI's answer alongside their own critique of it. They must spot errors, flaws or biases. Unlike writing an essay from scratch, this process compels them to engage with the material on a much deeper level"

Here, AI acts less like a search engine and more like a debate opponent, putting forth an idea that the student must critically examine and oppose (Nelson, et al. 2025).

Theme 2: Building skills to Judge and Analyse

A prominent finding across all three cases was the development of source-evaluation skills. Students compared AI outputs with credible sources, forcing them to evaluate authority, accuracy, and bias. A survey respondent from a state university using open and distance learning noted:

“Students are learning to question AI, not just trust it. They ask: Why? What are your sources? What are you missing? This critical thinking is essential.”

This aligns with the core component of critical thinking that involves assessing the credibility of claims (Facione, 2023).

Theme 3: Moving to Higher-Order Thinking

Lecturers observed a necessary shift in their own teaching and the students' cognitive roles. Most of them suggested that since AI is responsible for basic summarisation and information retrieval, classroom discussions could focus on application, analysis, and creation as indicated in the higher levels of Bloom's Taxonomy. A lecturer from the private university explained:

“We let AI summarise what happened, so we can spend more time analysing why and imagining what could be”
This suggests that AI can do the basic mental work, leaving room for focusing on deeper and more critical tasks ((Vygotsky, 1978).

Theme 4: A Complicated Reliance

Despite the positive potential of AI in developing critical thinking amongst students in tertiary institutions, a significant theme raised by lecturers was the **complicated reliance**. Several lecturers feared that students, without clear structure, would become over reliant on AI and stop thinking for themselves. One interviewee cautioned:

“The danger is using AI as a crutch, which weakens critical thinking. Our challenge is to design assignments that use it as a starting point, not the answer” This paradox highlights the crucial role of the educator in designing learning experiences that actively foster critique rather than passive acceptance (Casal Otero et al. 2023)

CONCLUSION AND RECOMMENDATIONS

This study, through an interpretivist lens, demonstrates that AI's effect on student thinking in Zimbabwean universities depends entirely on how lecturers use it. When guided well, AI can prompt deeper questioning, improve evaluation skills, and focus class time on advanced analysis. However, this only works if lessons are designed to prevent student from becoming over reliant on the technology.

Based on the findings, the following recommendations are proposed:

1. **For Lecturers:** Embrace AI as a teaching tool by designing tasks that require students to evaluate and build upon AI generated work.
2. **For Institutions:** Provide faculty workshops on using AI to promote and not hinder critical analysis.
3. **For Curriculum Developers:** Require all programmes to teach students how to evaluate AI and digital sources critically.
4. Future research could track the long-term impact of AI on students' critical thinking and directly seek student feedback to complement the teacher insights from this study.

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