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Impacts of ChatGPT on Critical Thinking: Perceptions of Tanzanian Higher Education Students

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ABSTRACT: In Tanzania, there exists a variety of perceptions regarding the adoption of Artificial Intelligence (AI) in education, particularly concerning the use of ChatGPT, raising concerns with mixed perceptions about its influence and potential effects on critical thinking and traditional learning practices. Consequently, this study took initiative to explore perception of students in utilizing ChatGPT in the academia and offer future directives. To achieve its objectives, the study used a mixed methods approach, using 170 students from two higher education institutions: Institute of Finance Management (IFM) and Moshi Co-operative University (MoCU). A convenient sample of 133 students was obtained through online questionnaires. The study found out that majority of the students (n=124, 93%) were aware of ChatGPT and utilizes it as a study and writing support mostly. Majority, (n=72, 55%) noted that ChatGPT has influenced their critical thinking positively while few (n=35, 26.7%) said it has impacted them negatively due to overreliance and disruption to traditional learning methods. Also, (n=98, 85.2%) noted that ChatGPT plays a supportive role to education while few (n=17, 14.8%) noted it was a threat to education echoing the dilemma that the country faces with adoption of AI in education. Many (n=53, 43.1%) noted they were not sure if ChatGPT is being misused or not in the academic as there are no clear guidelines and policies which have established fair use. The study recommends developing clear policies for ChatGPT integration in teaching, ensuring it complements—rather than replaces—critical thinking, human interaction, and creativity. Ethical guidelines should address plagiarism, fair use, and balanced adoption alongside other AI tools.

Keywords: Artificial Intelligence, ChatGPT, Critical thinking, Higher Education Institutions, Tanzania.

ABSTRAK: *Di Tanzania, terdapat beragam persepsi terkait adopsi Kecerdasan Buatan (Artificial Intelligence/AI) dalam pendidikan, khususnya mengenai penggunaan ChatGPT. Hal ini menimbulkan kekhawatiran dengan adanya pandangan yang beragam mengenai pengaruh dan dampaknya terhadap kemampuan berpikir kritis serta praktik pembelajaran tradisional. Oleh karena itu, penelitian ini berinisiatif untuk mengeksplorasi persepsi mahasiswa dalam memanfaatkan ChatGPT di dunia akademik serta memberikan arahan ke depan. Untuk mencapai tujuan tersebut, penelitian ini menggunakan pendekatan metode campuran dengan melibatkan 170 mahasiswa dari dua perguruan tinggi: Institute of Finance Management (IFM) dan Moshi Co-operative University (MoCU). Sampel sebanyak 133 mahasiswa diperoleh melalui kuesioner daring. Hasil penelitian menunjukkan bahwa mayoritas mahasiswa (n=124, 93%) mengetahui tentang ChatGPT dan memanfaatkannya terutama sebagai dukungan belajar dan penulisan. Sebagian besar (n=72, 55%) menilai ChatGPT berpengaruh positif terhadap*

kemampuan berpikir kritis mereka, sementara sebagian kecil (n=35, 26,7%) menyatakan pengaruh negatif karena ketergantungan berlebihan serta gangguan pada metode pembelajaran tradisional. Selain itu, (n=98, 85,2%) menyatakan bahwa ChatGPT berperan sebagai pendukung pendidikan, sementara sebagian kecil (n=17, 14,8%) menilainya sebagai ancaman bagi pendidikan, mencerminkan dilema yang dihadapi negara dalam mengadopsi AI dalam pendidikan. Banyak mahasiswa (n=53, 43,1%) menyatakan tidak yakin apakah ChatGPT disalahgunakan di dunia akademik atau tidak, karena belum adanya pedoman dan kebijakan yang jelas mengenai penggunaan yang wajar. Penelitian ini merekomendasikan penyusunan kebijakan yang jelas terkait integrasi ChatGPT dalam pengajaran, dengan memastikan bahwa penggunaannya melengkapi—bukan menggantikan—berpikir kritis, interaksi manusia, dan kreativitas. Pedoman etika juga perlu mengatur terkait plagiarisme, penggunaan yang adil, serta adopsi seimbang bersama alat AI lainnya.

Kata Kunci: *Berpikir Kritis, ChatGPT, Kecerdasan Buatan, Perguruan Tinggi, Tanzania.*

INTRODUCTION

The rapid advancement of Artificial Intelligence (AI) has significantly transformed educational practices worldwide. ChatGPT, an advanced conversational AI model developed by OpenAI based on the Generative Pre-trained Transformer (GPT) architecture, was launched in November 2022 (Tarisayi, 2024). In academia, ChatGPT serves as a versatile tool for content generation, teaching and learning support, research assistance, academic collaboration, data analysis, and time-saving for students and faculty (Xulu, Hlongwa & Maguraushe, 2024; Tarisayi, 2024). However, its growing adoption raises critical questions about its influence on learning processes, particularly concerning critical thinking, which is a cornerstone of higher education. This study seeks to examine the role of ChatGPT in Tanzanian higher education by addressing three key objectives: 1) To examine utilization of ChatGPT among students in selected higher learning institutions in Tanzania; 2) To examine the impact of ChatGPT utilization among students on critical thinking in selected higher learning institutions in Tanzania; 3) To explore perception of utilization of ChatGPT among students on critical thinking in selected higher learning institutions in Tanzania.

With the popularity of this tool, many in the academic community are still concerned with utilization of ChatGPT in academia despite its benefits. Concerns over ChatGPT jeopardizing academic integrity, fears of overreliance and dependence on AI thereby reducing critical thinking and plagiarism are on the rise (Matto, 2024). In the same vein, a Kenyan man went viral in November 2024 for crediting ChatGPT after graduating successfully. Many were appalled by the video on social media noting academic fraud and lack of integrity while some questioned if it was possible for the university to revoke the degree. These mixed perceptions are what faces the integration of Artificial Intelligence in academic context in many African countries, including Tanzania highlighting the tension that persists on perceived threats to the education system.

In Tanzania, Artificial Intelligence integration in education to enhance education delivery is perceived as beneficial for AI tools have insurmountable benefits to include, but not limited to, time saving, personalized learning, improved accessibility and enhanced assessment (Mwabile and Mwogosi, 2024). Studies have also shown readiness of academic staff to utilize AI tools in teaching

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to harness the aforementioned benefits and potential (Ponera and Madila, 2024; Mwabile and Mwogosi, 2024) yet, majority of academic staff in the faculty and society at large are skeptical and cautious about AI utilization in the classroom and amongst students especially ChatGPT (Farid, 2024; Mwabile and Mwogosi, 2024) fearing plagiarism, stifled critical thinking, data privacy and erosion of academic integrity (Ogalo and Mtenzi, 2025). With this conundrum, this study aims to explore the impact of ChatGPT utilization on student critical thinking among selected HEIs in Tanzania to fill the knowledge gap.

Related Literature

Proficiency in written communication is a crucial factor in determining a student's capacity to interact with intricate ideas, participate in academic discussions, and eventually thrive in a knowledge-based economy. Furthermore, developing critical thinking skills through writing is essential because it helps students develop the analytical and evaluative skills they need to navigate in a world that is becoming more complex by the day (Minh, 2024). In such a situation, accomplishing academic assignments can present difficulties for any student; paperwork, research, and final projects like theses and dissertations are all part of academic pursuits. To overcome these challenges, students can utilise technological tools like ChatGPT and artificial intelligence (AI) to manage their workloads efficiently and set priorities for their tasks (Marbun, 2023).

The replication of human intelligence in machines that are made to think and learn in a manner like that of humans is known as artificial intelligence (AI). Chatbots with AI capabilities, such as OpenAI's GPT-3, 3.5, and 4, have emerged as a valuable tool in this context. However, ChatGPT might inadvertently create and spread misleading information. This might mislead students in educational settings (Dilekli & Boyraz, 2024; Wong, 2024).

In the realm of education, artificial intelligence (AI) is essential. On the other hand, AI offers a wealth of information resources, like virtual laboratories and online courses, which allow students to learn in a more expansive and transparent environment. Innovative teaching tools like multimedia courseware and intelligent teaching systems have also been made possible by technology improvements. These tools enable teachers better control the classroom environment and encourage students' initiatives and interests (Yu, 2023; Hikmah & Walida, 2024; Minh, 2024; Dilekli & Boyraz, 2024).

Although ChatGPT can serve as a helpful tool, critical thinking abilities cannot be replaced by it and could cause individuals to refrain from actively participating in intricate cognitive processes, jeopardising their critical thinking skills (Wong, 2024; Suriano et al., 2025). Critical thinking (CT) is widely included in curricula around the world and is frequently seen as a crucial 21st-century skill (Jiang, 2024). Reasoning is an essential part of critical thinking, and it plays a significant role in problem solving and decision-making (Li et al., 2024).

Higher education institutions (HEIs) must reconsider outdated teaching theories and adopt innovative, interactive teaching-learning models to foster critical skills among students. It also calls for a new approach to HE didactics that

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sees students as experts of the environment and lifeworld rather than as recipients of knowledge and integrates this expert knowledge in the ongoing development of teaching concepts (Weimann-Sandig, 2023). A study by Suriano et al., (2025) establishes that Students' critical thinking abilities can be developed through the usage of ChatGPT, which gives the chance to investigate problems from multiple angles and broaden their understanding. To prevent passive reliance on AI chatbots, it is imperative to implement an educational strategy that encourages active participation and in-depth understanding.

In the context of higher education in Tanzania, the use of AI tools for improving students' learning is perceived with mixed concerns of acceptance and denial, rendering these tools a double-edged sword (Farid, 2024). ChatGPT is a popular AI application amongst students in universities due to its ability to generate human-like text responses based on the prompts (input) it receives. The tool's versality helps students in education tasks such as answering questions, drafting essays, creating content such as presentations and social media captions, coding, brainstorming ideas, translating languages and tutoring. These benefits improve pedagogy and promotes learning yet they interfere with perceived traditional learning of teacher-centered approach which focuses on interactions, assignments, and peer group support through structured curriculum requirement on morals and ethics thereby relying mostly on reading materials- notes, handouts, and books for learning instead of receiving ready-made answers though ChatGPT. In the same vein, Mwambo and Kaaya (2024) noted that unregulated ChatGPT use amongst students could have adverse effects on privacy violation, plagiarism, potential biases and overall academic integrity, sentiments that were echoed by Matto (2024) and Mwakapina (2024) in Tanzania education context.

Conceptual Framework

This study is guided by the Unified Theory of Acceptance and Use of Technology (UTAUT) model, which originated from the Technology Acceptance Model by Davis (1989). The major aim of TAM was to provide the ground for understanding the influence of external variables on internal beliefs, attitudes, and intentions among individuals (Marchewka & Kostiwa, 2007). Davis (1989) alluded to the degree to which an individual feel that utilising a system would improve his or her performance at work as perceived usefulness. The degree to which someone feels that utilising a system would require less mental effort is known as perceived ease of use.

To consolidate earlier TAM-related studies, Venkatesh, Moris, Davis, and Davis (2003) developed the Unified Theory of Acceptance and Use of Technology (UTAUT) model (See Figure 1). The variables of perceived usefulness and ease of use from the original TAM study were incorporated into the UTAUT model using performance expectancy and effort expectancy. According to the UTAUT model, user acceptance of information technology can be significantly influenced by the effort expectancy variable, although after time and sustained use, ease of use concerns may cease to be significant. Consequently, only in the early phases of a

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new technology's usage can perceived ease of use be expected to be more salient, and it can positively impact the technology's perceived usefulness.

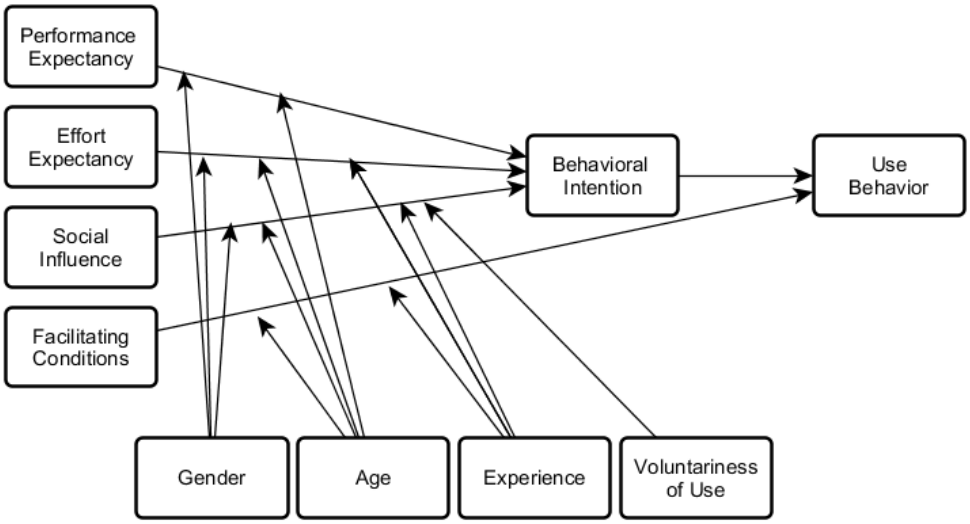

Figure 1. The UTAUT Model (Source: Venkatesh et al., 2003)

Additionally, the UTAUT model aims to explain how individual variations impact the use of technology. More precisely, age, gender, and experience can all act as moderators in the relationship between perceived usefulness, ease of use, and intention to use. For instance, the relationship between perceived usefulness and intention to use changes with age and gender, with younger and male workers experiencing a stronger correlation. In the context of this study, students' perceptions of ChatGPT's usefulness and ease of use in relation to academic activities like class assignments, references, language translation, and editing can affect how often they utilise the technology. Peer social influence may influence students to use ChatGPT, particularly if they see the advantages their peers are experiencing from using AI in the classroom.

Facilitating conditions is directly linked with the university environments and the availability of the required facilities and services, such as computers, internet services, training on the use of ChatGPT, and AI use policies. All these together can determine the actual use of AI technologies in educational activities among students. The environments and the accessibility of necessary resources, including computers, internet access, ChatGPT training, and AI usage policies, are directly related to facilitating conditions. Together, these factors can decide how students really use AI technologies in their educational activities.

In addition to incorporating other factors like gender, UTAUT assumes that male university students are more likely to use ChatGPT than female students due to their higher degree of self-efficacy. Age factor can determine the utilisation of ChatGPT, where undergraduates are likely to utilise ChatGPT more than postgraduates because they have different experiences and different levels of educational backgrounds. Since postgraduate students are mature, they may weigh several considerations before deciding to adopt such a technology, including their data privacy, the applicability of the information produced by

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ChatGPT, and its significance in learning. Lastly, another factor that could influence students' decision to use ChatGPT is voluntariness. Students become willing to use a new technology after examining some criteria, and hence others may not be willing to utilise a new technology despite the availability of all facilitating conditions.

RESEARCH METHOD

The study was carried out in two higher education institutions in Tanzania: Moshi Co-operative University (MoCU) and the Institute of Finance Management (IFM). A mixed methods approach was employed to facilitate the collection of both quantitative and qualitative data. This approach was adopted due to its capacity to intersect with other approaches such as action research by adding a solid methodological foundation and creating an integrated approach for address practical problems as elaborated by Ivankova and Wingo (2018). Also, the mixed methods enhanced integration of quantitative and qualitative thereby data provide a comprehensive, multi-layered analysis. Specifically, quantitative data collected sought to establish the extent and frequency of student awareness and utilization of ChatGPT, addressing the 'what' and 'how much' by providing generalizable, statistical patterns across the two studied institutions. Subsequently, the qualitative data delved into the nature and perceptions behind this usage, addressing the 'why' and 'how' by exploring the nuanced reasons, contextual experiences, and underlying attitudes that students hold regarding ChatGPT's role in their academic work and its impact on critical thinking. Thus, the two data strands complemented one another ensuring a coherent exploration of both the scope and the depth of ChatGPT's integration in higher learning and its impact on critical thinking.

To achieve its objectives, the study gathered primary data through a questionnaire and interviews. The study used a semi-structured questionnaire which was designed using Google Forms, and then pre-tested for validity and reliability prior being shared to students via their WhatsApp groups with a pilot group of 15 students (not part of the final sample) to assess clarity, relevance, and reliability. Feedback was collected on ambiguous or leading questions, and adjustments were made to improve wording and structure. Content validity was ensured through expert review by two academic researchers familiar with AI in education from MoCU and IFM, while internal consistency reliability was measured using Cronbach's alpha and the tool demonstrated good internal consistency, with a Cronbach's alpha coefficient of 0.82, indicating acceptable reliability. Based on pilot responses, minor refinements were made, including simplifying technical terms and rephrasing double-barreled questions. This process enhanced the tool's robustness before deployment.

In total, 133 randomly picked students completed the questionnaire, with 83 from MoCU and 50 from IFM. For the interviews, structured interviews were held with 17 students, eight from MoCU and nine from IFM, selected purposively due to their information and knowledge with regard to the study's focus. The data collected from the questionnaire were downloaded from Google Forms and

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imported to the Statistical Package for the Social Sciences (SPSS) where analysis was done. Concerning interviews, collected data was analysed thematically using content analysis. The analysis was aimed at finding summarisation and interpretation of data to gain insights and understand patterns, trends, and relationships within the data. Presentation and discussion of findings was done as per the objectives and presented thematically.

Ethical approval was obtained prior to data collection from the two institutions and informed consent was secured digitally within the Google Form and verbally before interviews through explaining the aim of the study and how the information provided will be used for the study only and not for other malicious intent. Participant anonymity was ensured by collecting no identifying information in the survey and using pseudonyms for interview transcripts. All data was stored securely on password-protected laptops, and participants were advised of their right to withdraw at any stage without penalty or decline altogether to participate in the study.

RESULTS AND DISCUSSIONS

The study set out to explore higher education students' perception on ChatGPT utilization in academics on critical thinking. The study found out that majority of the students (n=124, 93%) were aware of ChatGPT and utilizes it as a study and writing support mostly. Majority, (n=72, 55%) noted that ChatGPT has influenced their critical thinking positively while few (n=35, 26.7%) said it has impacted them negatively due to overreliance and disruption to traditional learning methods. Also, (n=98, 85.2%) noted that ChatGPT plays a supportive role to education while few (n=17, 14.8%) noted it was a threat to education echoing the dilemma that the country faces with adoption of AI in education. Many (n=53, 43.1%) noted they were not sure if ChatGPT is being misused or not in the academic as there are no clear guidelines and policies which have established fair use.

Background Information of the Respondents

The study collected data from MoCU (n=83, 64.4%) and IFM had (n=50, 37.9%) making a total of 133 respondents. Initially the study targeted 170 students and the responses obtained were a total of 151 yet some students left some questions unanswered necessitating deletion of incomplete information during data cleaning to facilitate data analysis. As such, a response rate of 78.2 percent which is acceptable as indicated by Fincham (2008) who noted that response rates approximating 60% for most research should be the goal of researchers. Gender wise, majority of the respondents (n=84, 63.2%) were male while (n=49, 36.8%) were female. The gender disparity could be attributed to the gender engagement gap in universities as examined by Tartari and Saltar (2015) who found out that women in academics engage less and in different ways than their male counterparts. Also, drawing on the Unified Theory of Acceptance and Use of Technology (UTAUT), which posits that performance expectancy and effort expectancy are key determinants of technology adoption, it is plausible that

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gender-based differences in perception could exist. For instance, prior research using UTAUT has shown that gender can moderate how users perceive a technology's usefulness and ease of use. Additionally, majority of the students (n=129, 96.9%) were bachelor's degree level while only (n=4, 3%) were at master's level as can be evident in the TCU (2018)'s report on students enrollment noting an increase yearly on undergraduate students. In the area of specialization at their respective institutions, majority (n=82, 61.6%) were in accounting and finance which included students specializing in banking, accounting, economics, taxation, and microfinance and enterprise management. Some (n=18, 13.5%) specialized in information technology while law and community development were (n=8, 6%) respectively and a few (n=7, 6%) were specializing in procurement and supply chain.

Table 1. Demographic Information

Demographic Information	Study Area	Frequency	Percentage
Higher education institution	MoCU	83	64.4%
	IFM	50	37.6%
Gender	Male	84	63.2%
	Female	49	36.8%
Level of Education	Bachelor's degree level	129	96.9%
	Master's level	4	3%
Area of Specialization	Procurement and supply chain	7	5.2%
	Information Technology	18	13.5%
	Accounting and Finance	82	61.6%
	Law	8	6%
	Community development	8	6%
	Marketing	10	7.5%

Source: Field Data (2025)

Utilization of ChatGPT in the selected higher education institutions

Students were asked about their familiarity with ChatGPT for academic purposes and majority (n=124, 93.2%) indicated they were familiar with ChatGPT for academic purposes while a few (n=6, 4.5%) were ambivalent and (n=3, 2.3%) noted they were not familiar with ChatGPT, as shown in Fig. 2. In literature, Pallivathukar et al. (2024) conducted a study examining ChatGPT awareness among undergraduate healthcare students in Malaysia and found varying level of awareness of ChatGPT's academic utility. On the other hand, Farhi et al. (2023) examined ChatGPT usage among students in the United Arab Emirate (UAE) and found that students consider ChatGPT a revolutionary technology that helps students in many ways a finding that was also echoed by Klimova and Campos (2024) among selected universities in Czech Republic. In Tanzania higher education institutions, Ojubanire et al. (2025) investigated the awareness and adoption of ChatGPT in HEI in Africa and found that ChatGPT adoption is higher in

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Morocco than in Nigeria and Tanzania, with females more aware but males showing greater usage similarly to the current study findings.

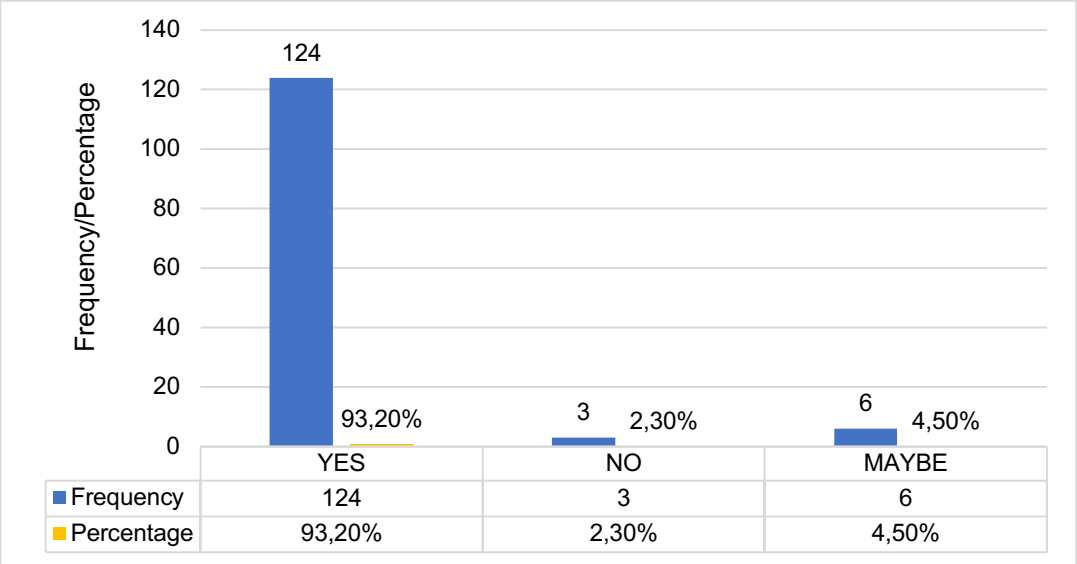

Figure 2. ChatGPT Utilization Awareness (Source: Field Data, 2025)

The students were also asked how often they use ChatGPT for academic purposes and majority (74, 56.1%) indicated sometimes while (25, 18.9%) Often indicated utilization and some (n=20, 15.2%) indicated they always utilise ChatGPT. Others (n=11, 8.3%) and (n=2, 1.5%) indicated they rarely and never utilise ChatGPT for academic purposes respectively as summarised in Fig 2. In literature, Babu et al. (2024) explored usage rates of ChatGPT among generation 'Z' in public universities and found that Gen Z students had the most significant impact on ChatGPT usage among university students. On the other hand, Elhassan et al. (2025)'s study findings on familiarity and usage patterns of medical students for medical education and revealed familiarity with and usage of ChatGPT and other chat-based AI apps were common among the students of Alfaisal University. Specifically, the study noted that males showed more familiarity with ChatGPT compared to females and students believed that using ChatGPT and other chat-based AI apps for coursework was ethical. Though this study findings showed differed awareness, yet overall, its above average although exploration on gender utilization was not explored.

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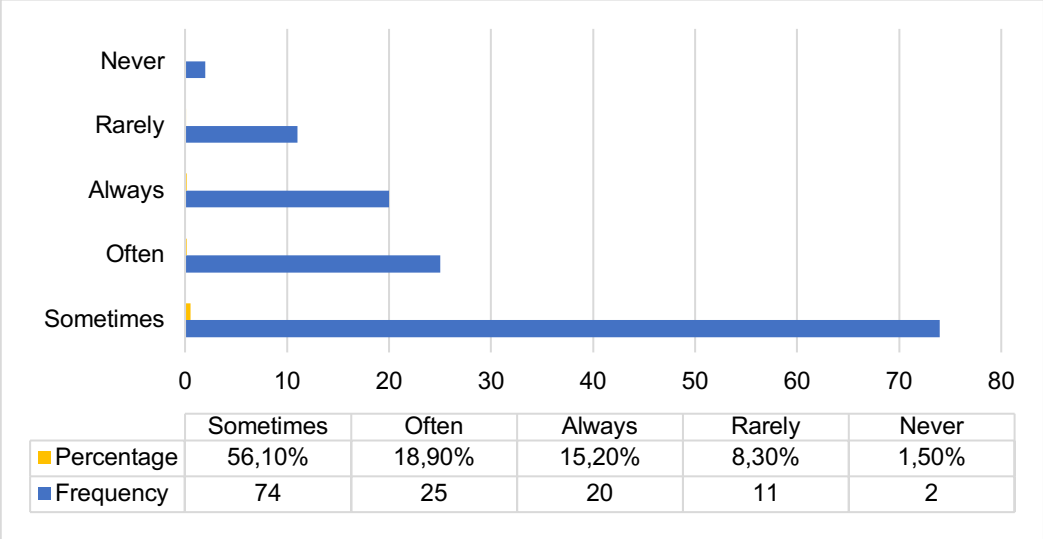

	Sometimes	Often	Always	Rarely	Never
Percentage	56,10%	18,90%	15,20%	8,30%	1,50%
Frequency	74	25	20	11	2

Figure 3. Frequency of ChatGPT utilization (Source: Field Data, 2025)

Students were also asked to indicate tasks that they use ChatGPT for in their academic journey and majority (n=90, 68.9%) noted that they use ChatGPT for study assistance and other (n=11, 8.4%) used ChatGPT for writing support. Some (n=9, 6.9%) indicated they use ChatGPT as research aid tool, for language and communication and content creation. Few respondents (n=3, 3.2%) indicated that they use ChatGPT for research collaboration as summarised in Fig. 3.

Tiwari et al. (2024) investigated what drives students toward ChatGPT to establish factors influencing usage and found out that the tool's usefulness in enhancing the quality of learning as the major driving factor while adding the assistance offered in learning and accomplishing of the academic tasks quickly and effectively lures the student to the tool similarly to Niloy et al. (2024) study findings. In Kenya, Chivose (2023) explored usage patterns of ChatGPT and established that at University of Nairobi students used ChatGPT for information retrieval, research facilitation, and problem-solving due to ChatGPT's perceived benefits of provision of academic support, time efficiency, and increased creativity. In Tanzania, Matto (2024) findings showed that university students were using ChatGPT for helping them prepare for exams, undertaking assignments, and writing research proposals and reports while exploring if ChatGPT is building or destroying education, findings which are similar to this study findings showing a pattern of utilization of ChatGPT for study support.

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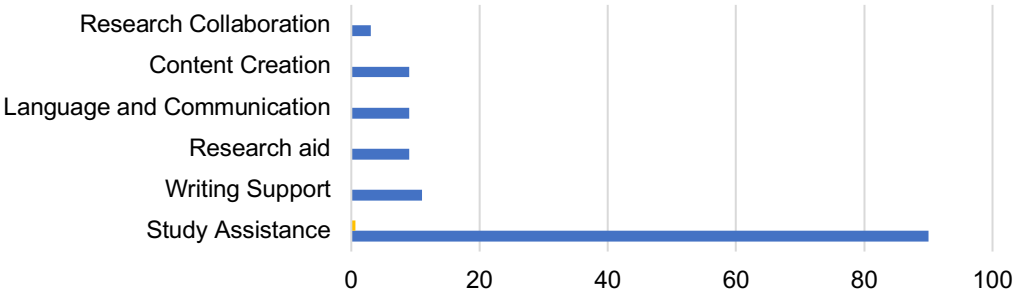

	Study Assistance	Writing Support	Research aid	Language and Communication	Content Creation	Research Collaboration
Percentage	68,70%	8,40%	6,90%	6,90%	6,90%	2,30%
Frequency	90	11	9	9	9	3

Figure 4. Tasks Performed using ChatGPT among students (Source: Field Data, 2025)

Furthermore, students were asked to reveal the benefits they get when utilizing ChatGPT for their academic works and one of the respondents noted that, *"…It helps me to summarize large books into short yet precise notes hence saving time and improves my ability to access many books despite the fact that ain't a bookworm!"*. Another respondent asserted that, *"…I get to understand better the concepts and increasing the knowledge of issues or things that I don't understand well in class or books in a simplified well through asking ChatGPT.* Notably, another respondent added that, *"…Interpretation of different question, solving question and getting guidelines on how i can solve or answer a certain* question *provided also help me to know other things related to my everyday life."*

On the other hand, another respondent alluded that, *"…I get more experience and getting familiar with different academic issues especially in my private study and content creation".* One respondent added that, *"…The system provides direct answers more than books and articles that requires a lot of time in searching for something".* Notably, another respondent averred that, *"…It simply on creating a basic content on certain matter, examples when a student fail to understand well on a certain subject so may be entitled to use ChatGPT in order to get even concept of that subject and then for a person with high thinking capacity may find in more detailed from various scholars and different written books."*

Additionally, another student notably added that, *"…ChatGPT can summarize laws, legal precedents, and policies related to various issues. It can explain complex legal concepts in simpler terms for better understanding".* Another respondent cautioned that, *"…It at least gives a light but not general because sometimes it may give the false information pertain the subject matter. This is quite a mere information giver compare to that information which a student may have example from library resources like books, journals and other sources."*

Moreover, the students' responses showed that despite the fact that university management in Tanzania are yet to have clear guidelines on utilization

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of AI for education and particularly policies and regulations to guide fair usage, majority of the students were using them and enjoyed the benefits that it amassed. In literature, Rasul et al. (2023) identified benefits of utilizing ChatGPT in academia enumerating advantages to include, but not limited to, the facilitation of adaptive earning, provision of personalised feedback and learning, support research and data analysis, and aid in developing innovative assessments. However, the authors went further to identify potential challenges namely academic integrity concerns, reliability issues, inability to evaluate and reinforce graduate skill sets, limitations in assessing learning outcomes, and potential biases and falsified sentiments that were echoed by Sok and Heng (2023); AIZaabi et al. (2023) and Islam and Islam (2024) recommending caution when using ChatGPT for academic purposes to ensure its ethical, reliable, and effective use.

The researchers further probed on how do students balance the use of ChatGPT and traditional learning and some of the notable responses from the respondents include *"…Literally it's in very rare cases that I use traditional academic tools or methods of learning anymore. ChatGPT has made everything available with just a prompt."* Another respondent added that *"…I Use ChatGPT only to digest/breakdown hard stuff into simple understanding materials and then cooperate the results into my normal study materials."* Additionally, another respondent alluded that *"…I balance using ChatGPT* when *I face difficulties different academic issues e.g. vocabularies after that I create my content so I balance using ChatGPT when I face difficulties."* Another respondent elaborated that *"…Since l am studying law ChatGPT can be highly trusted because it cannot give me relevance of Tanzania context so i must use and rely more from my traditional academic tool."*

Notably, another respondent revealed that *"…Honestly speaking ChatGPT is like 80% and 20% is for traditional academic tools."* While another respondent added that *"…I practice active learning, combine traditional report with AI assistance, focus in skill development, balancing screen time with offline activities, and set boundaries for AI use."* On a noteworthy point, another respondent added that *"…Use ChatGPT as a supplement to your traditional learning tools, not as a substitute. For example, use it to clarify complex concepts, brainstorm ideas, or get an alternative perspective on a topic."* Another respondent provided further insights that *"…I balance a lot as, ChatGPT itself cannot tell you what should be done unless you know what is supposed to be done and what you want it to assist you with. But as a researcher I still do a lot using traditional way and ChatGPT is used minimally being the benefit of technology advancement to simplify reading and material searching. As a current researcher, the use of technology is inevitable, what will be the worst is the overreliance to technology with no or very little personal thinking or creativity."* Also, it was noted by another respondent that, *"…It is very hard in balancing as ChatGPT digest almost everything in simple language as it makes me being relaxed and mostly depend on it, also due to having a lot of course work per time it makes it very difficult for a student to go and search other references due to limited time for submission of works."*

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One of the fears that most academicians have is overreliance on ChatGPT something that is still debatable. How much usage is too much? In literature, Ja'ashan (2024) explored combining teaching methods with AI assistance using ChatGPT for blended learning noting that despite ChatGPT's potential benefits in blended learning, its successful adoption requires targeted teacher-training, ethical guidelines, and localized adaptations to align with cultural contexts focusing more on knowledge to lecturer's so that they can teach the students to utilise the tool ethically thereby balancing traditional pedagogy with innovative technology to create effective and inclusive learning environment similarly to what Tanzania policy makers are envisioning.

Impact of ChatGPT on Critical Thinking

Students were asked to indicate whether ChatGPT has influenced their critical thinking positively and majority (n=72, 55%) noted that yes it has impacted them positively, while some (n=35, 26.7%) noted that it has not impacted them positively as they said no and others (n=24, 18.3%) indicated ambivalence as summarised in Fig. 5.

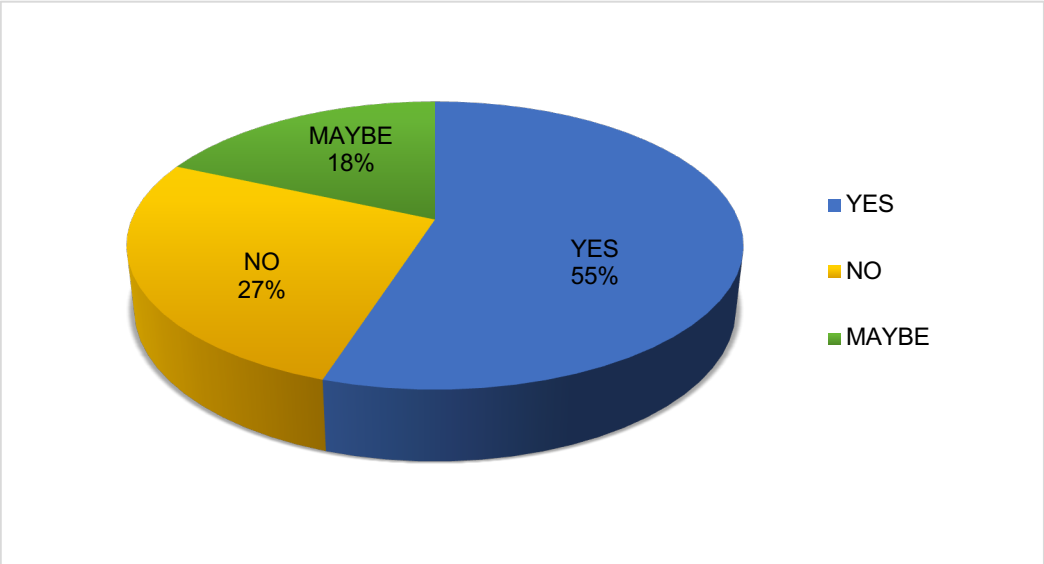

Figure 5. Impact of ChatGPT on critical thinking (Source: Field Data, 2025)

The respondents were sked to provide reasons for their answer and one respondent who noted that ChatGPT had a negative impact noted that, *"…More students are relying on ChatGPT instead of using their own thinking."* Another respondent who alluded ChatGPT had a negative impact on education enumerated reasons for the choice of the answer noting that, *"…1. it denies a* capacity *of students to use their knowledge to answer their problems. 2. it discouraged self*-awareness *to students' users. 3. it has damaged the level of students in applying various document in their studies rather than using ChatGPT as a* main *source of information in all aspects so, students they don't study hard as it in the past time. 4. it has discouraged* decision *making concerned with educational matters. 5. it reduced critical* knowledge *to users since they depend on ChatGPT without using their own thinking."*

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Another respondent added that, *"…It hasn't* influenced *my critical thinking positively since i can't even bother to think and explore solutions using my own understanding anymore, i just found myself using it whenever i meet difficult in thinking or understanding."* It was also noted by another respondent that, *"…Has not* influenced *my critical thinking since everything is there and simplified so, does not give a room for me to think, explore, analyse as far as critical thinking is concerned. It's causes brain laziness no time to think because everything is there given."* Another respondent alluded that, *"…It just makes people lazy to* think *and find more information, therefore it is creating non-critical thinkers."* It was also added that, *"…ChatGPT doesn't* influencing *my critical thinking because it led to increase in AI dependency and encouraging passive learning."*

For the respondents who noted that ChatGPT has a positive impact on their critical thinking, it was elaborated that, *"…It has* increased *my critical thinking capacity, U see ChatGPT uses Artificial Intelligence Combine with my intelligence it helps me level up by providing good ideas and knowledge by easy access just by writing the question. It also saves me time".* Another responded added that, *"…ChatGPT itself can't do anything as far as my study is concerned. Basically, I have to know what I want to do, what should I ask it to assist, compare its response with previous studies findings on which I can also criticise what it is suggesting over what I perceive to be the reality, I test its suggestions by further reading using other traditional methods."* Notably, another respondent notably indicated that, *"…Because ChatGPT can help foster positive critical thinking skills. By engaging in thoughtful discussions, asking probing questions, and offering different perspectives, I can encourage users to reflect, analyze, and consider multiple viewpoints. This process can stimulate deeper thinking and help refine decision-making abilities, problem-solving strategies, and overall reasoning skills. Critical thinking is strengthened when individuals are prompted to question assumptions, evaluate evidence, and draw well-supported conclusions."*

Lopes and Teymourifar (2024) explored integration of ChatGPT in educational environments for enhanced learning and responsible use and noted that despite its benefits in education, still ChatGPT raises critical concerns about data privacy, academic integrity, biases in training data, and the potential erosion of critical thinking skills underscoring the need for a balanced approach to integrating the tool in education.

Perception of ChatGPT amongst students in Higher Learning Institutions in Tanzania

ChatGPT has revolutionalised the education landscape and as Alali and Wardat (2024) expounded that the tool facilitates personalized and interactive learning and the generation of prompts for formative assessments, providing continuous feedback for instructional improvement sentiments that were echoed by Bozkurt et al. (2023) and Veza et al. (2023) on the transformative impact that ChatGPT will have on the learning landscape. In Tanzania, however, Mgonja (2024) notes that despite the AI benefits and revolutionary contribution it can have on healthcare, education, agriculture and public services, the country needs to adopt

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a proactive approach to its regulation before Al expands further. The author further poses a question that: Is the rapid push toward formalizing Al truly what the country needs if there are factors that remain unaddressed? And some of these factors include but not limited to, clear AI policies and guideline on fair use and legal and ethical frameworks.

When responds were asked about their perception of ChatGPT in higher education institutions, as Fig 6 shows, majority (n=98, 85%) viewed it as a supportive tool for education while few (n=17, 15%) viewed the tool as a risk to education underscoring what Farid (2024)'s article on Is ChatGPT a Double-edged Sword in the provision of quality education? As both benefits and risk factors are stipulated rendering Tanzania at an impasse as to whether to promote or impede its utilization, a conundrum yet to be solved (Yu, 2023; Ogugua, Yoon and Lee, 2023; Colitri, 2024); however, Borichi, varone and Diana (2024) took upon the subject as a result of Italy's unpopular decision to suspend ChatGPT in the country noting that despite the fact that the pace of technological development is not matched with up-to-date regulations, thereby making the relationship between institutional policies and technological advancements complex and controversial. It's in the light of this that government and higher education institutions should promote ethical ways of utilizing these tools instead of banning them or remain silent rendering users at an impasse too.

Additionally, respondents were also asked if they view ChatGPT as being misused in higher education institutions. As summarized in Fig. 7, respondents' answers varied as some of them noted indeed the tool is being misused i.e. (n=37, 30.1%) citing the easy answers provided are making most students over relying on the tool and many don't invest in scrutinizing the answers but rather are in a hurry to complete their tasks. On the other hand, some (n=33, 26.8%) noted that the tool is not being misused in higher education institutions as it is a supportive tool to education and it won't replace traditional means of learning or teaching. Majority noted that the only fear of replacement of the tool to traditional way of learning and delivering or being misused is because clear policies and guidelines are not in place to create boundaries that will guide in fair use. Lastly, many (n=53, 43.1%) noted they were not sure as to whether the tool is being misused or not because no policy or guideline in higher education institutions in Tanzania have defined what percentage should be considered misusing or overreliance on the tool for academic purposes sentiments that were also in literature on the dilemma of ChatGPT utilization for education (Mustapha, 2024; Rogers, Hillberg and Groves, 2024).

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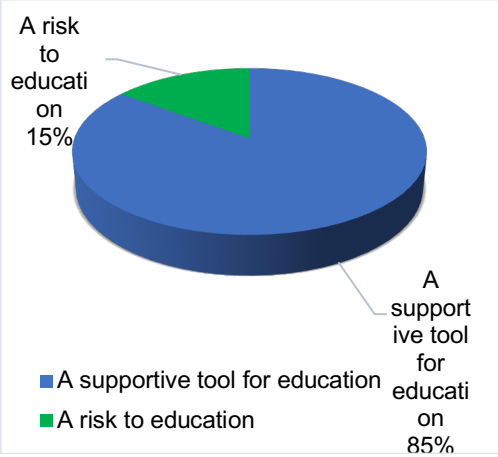

Figure 6. Roles of ChatGPT in education

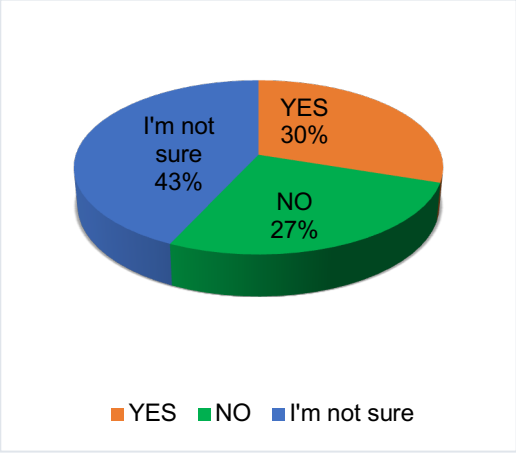

Figure 7: Is ChatGPT misused in HEIs? (Source: Field Data, 2025)

Challenges of utilizing ChatGPT in academic tasks among students in the studied higher education institutions

When respondents were asked to enumerate challenges that they faced while utilizing ChatGPT for academic purposes, it was noted that inaccurate information was seen as a big concern. This is because most students don't like to evaluate critically the information provided, instead, they enjoy the ease and quickness of information provided and rush to complete their academic works without double-checking if facts are true or not.

Also, many respondents noted that overreliance was another challenge as many rely on ChatGPT for doing their assignments, explore complex concepts and even prompt for case studies to cement their argument. However, few are now using library books or scholarly databases to read as they note when you read, you don't get the information you need directly. In turn, you have to spend time reading, summarizing and synthesizing ideas however, ChatGPT has made that easy as it provides direct information which is already summarised and synthesised. In turn, students are becoming dependent on this tool and use it mostly for their academic works rendering it the main source of information instead of a supportive tool.

Many indicated that the lack of support from lecturers and tutors is another challenge as when they submit their works citing that the assignment has been done with the help of ChatGPT they get penalised. Lecturers discourages the use of the tool instead of teaching students how to ethically and fairly use the tool. It was also noted that technology cannot be escaped hence instead of rendering the tool a threat, it should be educated to users on how best to utilise the tool for education support through clear guidelines in each institution just like there are examination, education and research guidelines.

Practical Implications of the Study

The findings have practical implication on the Tanzania education context implying a critical need to move from ad-hoc use to structured integration of AI.

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Practical implications include the urgent development of dedicated AI literacy programs and workshops that educate students on the ethical use of ChatGPT, focusing on how to leverage it as a critical thinking scaffold rather than a substitute for independent analysis. Furthermore, academic institutions should formulate clear guidelines and policies to promote responsible use, prevent plagiarism, and ensure AI tools augment rather than undermine the development of essential cognitive skills.

CONCLUSION

The study, guided by three specific objectives, noted that majority of the university students were aware of ChatGPT and most of them used the tools from time to time as a study assistant, writing support, research aid, content creation, language and communication and for research collaboration. The study also noted that most university students viewed the tool as beneficial due to its versality in offering information on a given subject at a fast speed based on the prompt. When it comes to balancing utilization of ChatGPT with traditional means of learning, it was established the balance is not stricken. The easy and quick way of obtaining information from ChatGPT makes most students dependent on the tool instead of library books and scholarly databases. Furthermore, ChatGPT has influenced critical thinking both in a positive and negative way as it offers cases, examples and information meet the needs of the students while on the other hand, the easy way of getting answers makes most relaxed and reluctant to read, cross check for facts and even supplement the tool with traditional means of learning rendering it a double-edged sword. This in turn could affect independent problem-solving or a quest and curiosity to search and explore learning and challenging one's intellectual capabilities. Although a risk to education is a threat to adoption of the tool in education, it was also established that many viewed ChatGPT as a supportive tool in their education journey. Lastly, varied opinions were noted regarding misuse of the tool in education while many said they were not sure if the tool is misused or not for there are no clear policies and guidelines which stipulates how much is too much usage of the tool for academic work. Inaccuracy of information provided, overreliance on the tool and lack of support from lecturers and tutors were challenges identified while using ChatGPT for education purposes.

Therefore, the study recommends policy formulation from the ministry level to university level and to regulators of education in Tanzania so as to establish ethical frameworks and boundaries of utilization of ChatGPT in education. This also will provide do's and don'ts so as to ensure fair use. In institutions, lecturers should guide students on how to utilise AI tools and particularly ChatGPT so to ensure a balanced used between modern learning and traditional means with the intention of fostering critical thinking yet making students ready to face the fourth industrial revolution in the work place. Review of academic guidelines in universities should take into consideration utilisation of ChatGPT so as to ensure we are not shying or hiding from technology but rather we are prepared. Information professionals in libraries of the academic

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institutions should be prepared to assume the role of providing the support of ChatGPT and other AI tools.

To operationalize these policies, specific guidelines in respective academic institutions should mandate the clear citation and attribution of AI-generated content, treating it similarly to any other source. Acceptable use could be defined through policies and guidelines similarly to permission of other's scholarly works constituting only 30 per cent of one's academic work and not more thereby permitting AI for brainstorming and editing while prohibiting its use for generating entire submissions. Institutions should develop assignment-specific rubrics that explicitly state permitted levels of AI assistance and the consequences for violating these boundaries. Also, plagiarism software utilized should also be able to capture AI utilization percentage to ensure academic integrity while fostering the responsible, transparent use of AI as a learning tool. Additionally, universities should initiate on-the-job professional development workshops to equip faculty members with practical skills for integrating ChatGPT. These programs would train lecturers to design AI-enhanced assignments that highlights critical analysis, such as comparing AI outputs to primary sources and provide clear ethical guidelines on citation and acceptable use. This empowers educators to strategically leverage AI as a tool for fostering, not replacing, independent student thought.

Limitations of the Study

A key limitation of this study is its relatively small sample size (n=113) and its confinement to only two institutions (IFM and MoCU), which restricts the generalizability of the findings to the broader Tanzanian higher education landscape which has forty-nine approved universities as per the 2024 Tanzania Commission of Universities' statistics. The gender imbalance, with males constituting the majority (63.2% male), also introduces a potential bias in the perceived impacts. Furthermore, relying on self-reported perceptions rather than objective measures of critical thinking presents a limitation.

Future Studies

Future research should employ a larger, more representative sample across multiple institutions and incorporate longitudinal or experimental designs to objectively measure changes in critical thinking skills and track the long-term impact of AI tool usage on the development of cognitive skills like analysis and evaluation. Research is also needed to explore effective pedagogical models that strategically integrate AI to complement, not replace, traditional methods and investigating specific interventions to mitigate overreliance, such as reflective exercises that mandate students critique AI-generated content, would be highly valuable particularly in the Tanzanian context.

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