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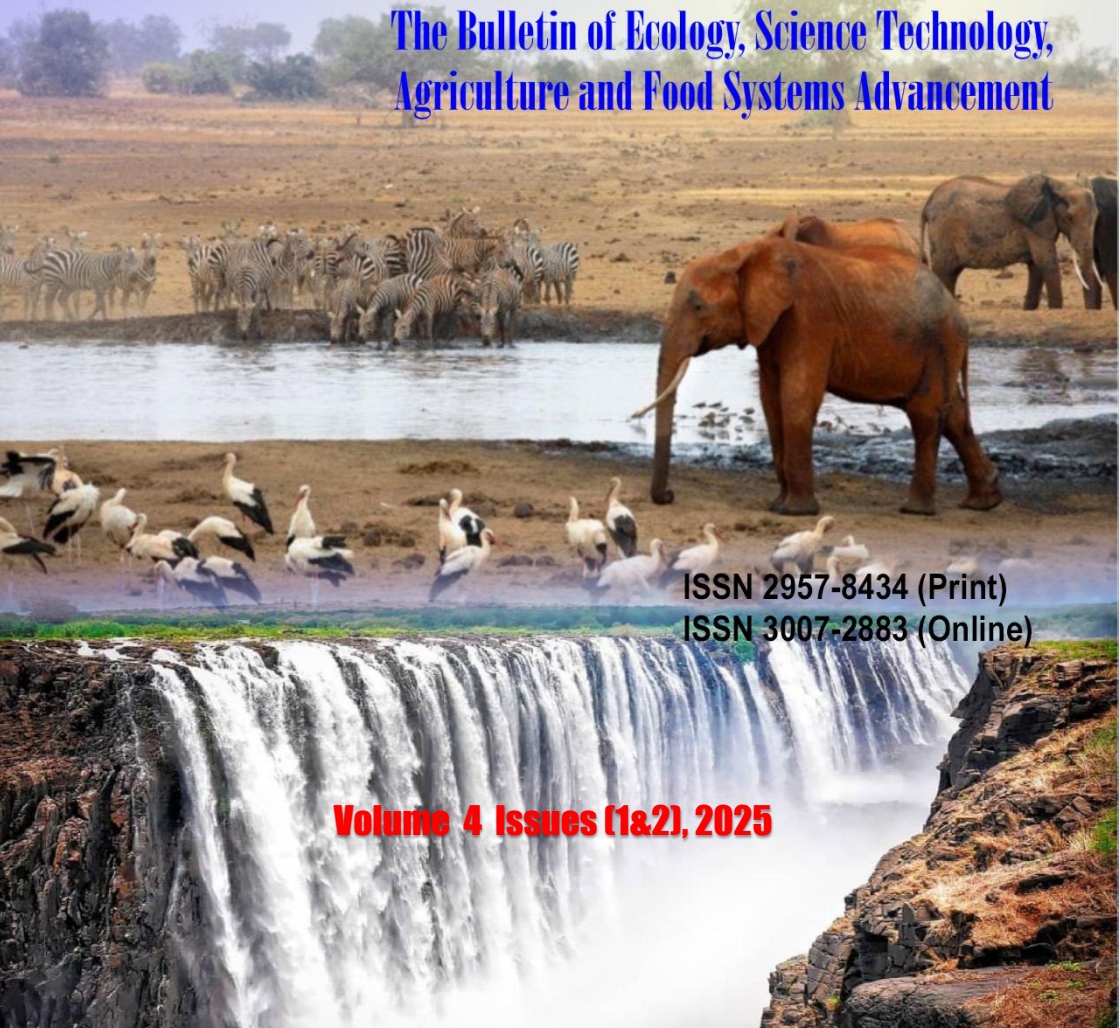
The Zimbabwe Ezekiel Guti University
The Bulletin of Ecology, Science Technology, Agriculture and Food Systems Advancement



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About the Journal

JOURNAL PURPOSE

The purpose of *the Oikos - The Zimbabwe Ezekiel Guti University Bulletin of Ecology, Science Technology, Agriculture and Food Systems Review and Advancement* is to provide a forum for scientific and technological solutions based on a systems approach and thinking as the bedrock of intervention.

CONTRIBUTION AND READERSHIP

Natural scientists, engineering experts, technologists, multidisciplinary teams are encouraged.

JOURNAL SPECIFICATIONS

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SCOPE AND FOCUS

The journal is a forum for the discussion of ideas, scholarly opinions and case studies of natural and physical science with a high proclivity to multidisciplinary approaches. The journal is produced bi-annually.

Guidelines for Authors for the *Oikos* Journal

Articles must be original contributions, not previously published and should not be under consideration for publishing elsewhere.

Manuscript Submission: Articles submitted to the *Oikos - The Zimbabwe Ezekiel Guti University Bulletin of Ecology, Science Technology, Agriculture and Food Systems Review and Advancement* are reviewed using the double-blind peer review system. The author's name(s) must not be included in the main text or running heads and footers.

A total number of words: 5000-7000 words and set in 12-point font size with 1.5 line spacing.
Language: British/UK English
Title: must capture the gist and scope of the article
Names of authors: beginning with the first name and ending with the surname
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Italicise *et al., ibid.,* words that are not English, not names of people or organisations, etc. When using more than one citation confirming the same point, state the point and bracket them in one bracket and in ascending order of dates and alphabetically separated by semi-colon e.g. (Falkenmark, 1989, 1990; Reddy, 2002; Dagdeviren and Robertson, 2011; Jacobsen *et al.,* 2012).

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Herald, 14 April 2020. Available online: https://www.herald.co.zw/harare-city-could-have-used-lockdown-to-clean-mbare-market/. Accessed on 24 June 2020.

UNPACKING THE ADOPTION OF ARTIFICIAL INTELLIGENCE CHATBOTS BY STUDENTS IN TERTIARY INSTITUTIONS IN MASHONALAND CENTRAL, ZIMBABWE

TAKUDZWA CHIDEMBO[1], WILLIAM MUCHONO[2] AND ENOCK MUSARA[3]

Abstract

This research article unpacks the perceptions of the academic community on the adoption of artificial intelligence (AI) chatbots (chatting robots) by tertiary students in Zimbabwean universities. The article seeks to understand the usage of AI chatbots in education, their opportunities, challenges, concerns and prospects of using AI chatbots in educational settings. The research findings revolve around the perceptions and scepticism of the adoption of AI chatbots in education, as seen from students, lecturers and librarians developing higher-order cognitive skills. The main objectives were to identify the main AI chatbots commonly used by tertiary students, to explore the opportunities of adopting of AI chatbots to students and to expose the pitfalls associated with the usage of AI by tertiary students. Participants were drawn from tertiary students, lecturers and university library staff members. The study employed qualitative methodologies, including in-depth interviews, observational checklist and focus groups. The findings suggest that AI chatbot is both a curse and a blessing to

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tertiary students. The study reveals that AI chatbots enhance learning experience, enable them to overcome skill gaps, bring insights on assignment writing and aid in exam preparation. The study reveals that AI chatbots foster the development of higher-order cognitive skills by augmenting traditional lectures, test preparation and personalisation. However, pitfalls include plagiarism, outdated information, shallow information, indolent and slothful laziness in students, as well as financial constraints associated with AI chatbots. The study recommends that universities must invest in workshops to train staff and students on the responsible ways of adopting and using AI to reduce the increase of luddites. Universities are recommended to develop referencing systems allowing students to acknowledge using AI chatbots as sources. Tertiary students are also recommended to fuse AI with human capacity, desisting from the culture of relying solely on AI chatbots.

Keywords: curse, blessing, tertiary students, Tertiary Education, Perceptions, Cognitive Skills, Opportunities and Challenges

INTRODUCTION

The traditional education system faces several issues, including overcrowded classrooms, lack of personalised attention for students, varying learning paces and styles and the struggle to keep up with the fast-paced evolution of technology and information. As the educational landscape continues to evolve, the rise of AI-powered chatbots emerges as a promising solution to effectively address some of these issues. Some educational institutions are increasingly turning to AI-powered chatbots, recognising their relevance, while others are more cautious and do not rush to adopt them in modern educational settings. Consequently, a substantial body of academic literature is dedicated to investigating the role of AI chatbots in education, their potential benefits and threats as the phenomenon is gaining a traction. This study is guided by the following objectives (a) to identify the main AI chatbots commonly used by tertiary students in Zimbabwe; (b) to explore opportunities of adopting AI chatbots by students in Zimbabwe; and (c) to expose the challenges associated with the adoption of AI by tertiary students in Zimbabwe.

CONTEXTUALISATION

What is Artificial Intelligence (AI)?

Artificial Intelligence (AI), a term coined by emeritus Stanford Professor John McCarthy in 1955, was defined by him as the science and engineering of making intelligent machines (Xiao and Yi, 2020). Xiao and Yi (*ibid.*) aver that AI is the branch of computer science, which makes computers to mimic human behaviour to assist humans for better performance in the field of science and technology. Replicating human intelligence, solving knowledge-intensive tasks, building machines, which can perform tasks requiring human intelligence, creating some system which can learn by itself, are the few specific goals of AI. AI involves the study of agents which perform actions on the precepts received from the environment (Russelland Norvig, 2016). Perception, intuition and cognitive abilities are generally considered to be characteristics inherent in humans. However, the definition by Russelland Norvig (*ibid.*) emphasises that machines can at least now perceive their surroundings and respond intelligently, based on such perceptions and their surroundings. On the other hand, Nilsson (2010) defines AI as an activity that involves creating machines with the capability to perform tasks that normally require human intelligence.

VanLehn (2011) notes a variety of AI tools used in the teaching and learning process. These include intelligent tutoring systems, chatbots and automated grading tools. Intelligent tutoring systems provide customised and personalised instructions to learners. The systems make use of complex machine learning algorithms which adapt to the learning content and align that to each individual student and provide tailor-made tutorials, support and feedback (VanLehn, *ibid.*). Chatbots use natural language processing techniques to analyse speech and written text and they can provide human-like responses (Abdul-Kader and Woods, 2015). Chatbots such as ChatGPT, Notion and Bing can engage in interactive conversations with learners, providing instant answers to their questions. Chatbots are proving to be useful and efficient in assisting students with assignments and brainstorming (Udupa, 2022).

Kumar (2020) contends that there are AI tools that can assist in plagiarism and AI written text detection such as Turnitin. In addition,

automated grading tools are infused in most electronic learning management systems and these have the advantage of reducing grading burden on lecturers, thus providing instant feedback to students (*ibid.*). However, automated grading tools have their own drawbacks such as bias when grading qualitative essays that are subjective in nature and may require human professional judgment as propounded by Gallagherand Breines (2022). This study saw it fit to premise by first bringing clarity on the basics of AI so as to avoid misconceptions.

Understanding AI Chatbots

AI-powered chatbots are designed to mimic human conversation using text or voice interaction, providing information in a conversational manner. Chatbots' history dates back to the 1960s and over the decades, they have evolved significantly, driven by advancements in technology and the growing demand for automated communication systems. Created by Joseph Weizenbaum at MIT in 1966, *ELIZA* was one of the earliest chatbot programmes (Weizenbaum, 1966). *ELIZA* could mimic human-like responses by reflecting user inputs as questions. Another early example of a chatbot was *PARRY*, implemented in 1972 by psychiatrist Kenneth Colby at Stanford University (Colby, 1981). *PARRY* was a chatbot designed to simulate a paranoid schizophrenic patient. It engaged in text-based conversations and demonstrated the ability to exhibit delusional behaviour, offering insights into natural language processing and AI. Developed by Richard Wallace in 1995, *ALICE* (Artificial Linguistic Internet Computer Entity) was another early example of a chatbot using natural language processing techniques and won the Loebner Prize Turing Test in 2000–2001 (Wallace, 1995), which challenged chatbots to convincingly simulate human-like conversations.

Later in 2001 ActiveBuddy, Inc. developed the chatbot *SmarterChild* which operated on instant messaging platforms such as AOL Instant Messenger and MSN Messenger (Hoffer *et al*., 2001). *SmarterChild* was a chatbot that could engage in conversations with users about a variety of topics. It was also able to learn from its interactions with users, which made it more and more sophisticated over time. In 2011, Apple introduced *Siri* as a voice-activated personal assistant for its iPhone (Aron, 2011). Although not strictly a chatbot, *Siri* showcased the

potential of conversational AI by understanding and responding to voice commands, performing tasks and providing information. In the same year, IBM's *Watson* gained fame by defeating human champions in the quiz show *Jeopardy* (Lally and Fodor, 2011). It demonstrated the power of natural language processing and machine learning algorithms in understanding complex questions and providing accurate answers. More recently, in 2016, Facebook opened its Messenger platform for chatbot development, allowing businesses to create AI-powered conversational agents to interact with users. This led to an explosion of chatbots on the platform, enabling tasks like customer support, news delivery and e-commerce (Holotescu, 2016). *Google Duplex*, introduced in May 2018, was able to make phone calls and carry out conversations on behalf of users. It showcased the potential of chatbots to handle complex, real-time interactions in a human-like manner (Dinh and Thai, 2018).

More recently, more sophisticated and capable chatbots amazed the world with their abilities. Among them, *ChatGPT* and *Google Bard* are among the most profound AI-powered chatbots. *ChatGPT* is an artificial intelligence chatbot developed by OpenAI. It was first announced in November 2022 and is available to the general public. *It's* rival, *Google Bard* chatbot, developed by Google AI, was first announced in May 2023. Both *Google Bard* and *ChatGPT* are sizable language model chatbots that undergo training on extensive datasets of text and code. They possess the ability to generate text, create diverse creative content and provide informative answers to questions, although their accuracy may not always be perfect. The key difference is that *Google Bard* is trained on a dataset that includes text from the internet, while *ChatGPT* is trained on a dataset that includes text from books and articles. This means that *Google Bard* is likely to be more up-to-date on current events, while *ChatGPT* is more likely to be accurate in its responses to factual questions (AlZubi *et al*., 2022; Rahaman *et al*., 2023).

Chatbots are now used across various sectors, including education. Most of the latest intelligent AI chatbots are web-based platforms which adapt to the behaviours of both instructors and learners, enhancing the educational experience (Chassignol *et al*., 2018). AI chatbots have been applied in both instruction and learning within the education sector.

Chatbots specialise in personalised tutoring, homework help, concept learning, standardised test preparation, discussion and collaboration and mental health support. Education chatbots are online robots that facilitate conversations between humans and computerised machines on educational issues in various learning areas using natural human language (Bradesko, Mladenic, 2012). This asserts that modern machines can understand human language and thus can be used to advance the quality of education due to their ability to store large amounts of information and reproduce it in several forms upon request by a human (Anghelescu, 2018). This makes chatbots versatile tools for improving the quality of higher education as they converse with students and answer instantly questions given to them. Zimbabwe cannot afford to be left behind in this education revolution.

THEORETICAL FRAMEWORK

This study is anchored on the Technology Acceptance Model (TAM). TAM was developed by Davis in 1989 as noted by Marikyan and Papagiannidis (2024). This is a commonly used theory to understand the acceptance and adoption of new technologies by individuals, in this regard acceptance and adoption of new AI by students in Zimbabwean universities. TAM focuses mainly on two key aspects: perceived usefulness and perceived ease of use. Therefore, it generally tries to understand the perceptions of individuals under study regarding the technology in question (*ibid.*). On perceived usefulness, the emphasis is understanding the extent to which students can develop higher-order cognitive skills. The assumption of this theory in respect of the current study, is that using AI chatbots not only benefit students, but also lecturers, as it enhances their job of teaching, research, community engagement, innovation and industrialisation as enshrined under Education 5.0 in Zimbabwe. To students, it also helps in assignment tasks, exam preparations and general practice of student different studies. Perceived ease of use shows the degree to which staff members believe that using AI will be free from a lot of effort and confusion. Therefore, by adopting this theory, the perceptions and attitudes of university staff members and tertiary students in Zimbabwean universities, are understood.

Materials and Methods

Study Setting

The study was carried out in Bindura, the provincial town of Mashonaland Central Province in Zimbabwe. The area was specifically chosen for it houses three universities, namely the Zimbabwe Ezekiel Guti University (ZEGU), Bindura University of Science Education (BUSE) and Zimbabwe Open University (ZOU). This provides a fertile ground for research as it presents a vast abundance of tertiary students, lecturers and university library staff members they are the cornerstone of this study.

Research Questions

The research unpacks AI adoption by students in tertiary institutions in Zimbabwe, dwelling greatly on unveiling how it is both a curse and a blessing. The specific research questions are:

i. Which are the main AI chatbots commonly used by tertiary students?
ii. What opportunities do AI chatbots have to tertiary students?
iii. What are the challenges associated with the use of AI by tertiary students?

Interpretivists Paradigm

This study is situated in the interpretive paradigm. The qualitative research approach was employed to gather data using research instruments like semi-structured interviews, observational checklist, focus group discussions and review of journals and other academic publications.

Research Approach

A qualitative research approach was chosen because it allows the analysis of words and their contextual meaning, people's behaviours and expressed emotions. These provide real-life scenarios of what is obtaining on the ground at a particular place and time. In this study, the intention was to acquire a deep understanding of the challenges and opportunities associated with AI, henceforth in tandem with the concepts of curse and blessing. This type of study calls for a deep understanding of tertiary students' views and emotions which can be

studied more qualitatively effectively. This sentiment resonates with that of Silverman (2000:8) who assert that qualitative methods are more interested in understanding facts than in numerical analysis of data. In this article, the qualitative research approach was preferred also because it is a versatile research approach that facilitates an in-depth comprehension of complex phenomena like AI chatbots used by tertiary students and provides for deep analysis based on personal experiences and points of view of the affected individuals (Mantula *et al.*, 2024). The qualitative research approach is embedded in the interpretivism paradigm, which seeks to explore and analyse social problems to understand the reasons behind people's experiences according to the particular situation they are in and may not necessarily be generalisable to the entire population or other related populations.

The arguments posed by this study are not a one-size-fits-all, no claim is made that they will apply to all crises in Zimbabwe and abroad. Interpretivism allows the researches to ascribe meanings to situations, behaviours and their findings contextually, albeit according to known theories and beliefs (Addo and Eboh, 2014). Qualitative research helps to contextualise and situate phenomena within their social, cultural and historical contexts. It explores the intricate relationships, dynamics and influences that shape individuals and communities, providing insights into how social factors impact behaviours, beliefs and interactions. The research allows for in-depth exploration and understanding of phenomena that are difficult to capture using quantitative methods alone. It provides rich, detailed and context-specific data that go beyond surface-level descriptions, enabling researchers to gain a deeper understanding of the participants' perspectives, meanings and lived experiences (*ibid.*).

Case Study Design

The present research adopted a case study design to obtain a closer to real-life situations and their multiple wealth of details. Bent (2006) posits that case studies are important for the development of a nuanced view of reality, including the view that human behaviour cannot be meaningfully understood as simply the rule-governed acts found at the lowest levels of the learning process and in much theory. Case studies also involve in-depth investigations of specific individuals, groups,

organisations, or phenomena in their natural settings to understand the real issues on the ground (*ibid*.). For this study, ZEGU, BUSE and ZOU were the chosen case studies.

Sampling Techniques

This study employed purposive technique to select research participants. According to Patton (2015), purposive sampling is a methodical approach that involves searching for "information-rich cases" that most effectively address the goals and inquiries of the research. Nikolopoulou (2022) asserts that purposeful sampling pertains to a collection of non-probability sampling techniques where units are intentionally chosen for their desired characteristics. In other words, purposive sampling involves purposeful unit selection. The research therefore used purposive sampling to select the participants who included tertiary students, tertiary lecturers and librarians.

Data Collection Tools

Data were gathered through desktop research and field research visits. The study administered in-depth face to face interviews to lecturers and librarians drawn from the three selected universities in Bindura. Three focus group discussions (FGDs, one from each university) were held with tertiary students with each discussion comprising students drawn across all levels conducted at the selected universities. The FGDs allowed the students to digest and share their views and experiences, whilst the interviews allowed the lecturers and librarians to respond in detail to the questions without being confined or limited. The qualitative observational checklist allowed the research to observe some fundamentals from all the targeted participants, thus managing to enrich this study.

Data Analysis

Data collected from the study participants were analysed using the qualitative thematic analysis to evaluate the corpus of data gathered through in-depth interviews, FGDs and the observational checklist. The research adopted the Braun and Clarke's six stages of thematic analyses that talk of:

i. Familiarising with the data,
ii. Generating initial codes,

iii. Searching for themes,
iv. Reviewing themes,
v. Naming and defining themes and
vi. Writing the research report.

Ethical Considerations

Research literature always emphasises the area of ethical considerations so as to protect both research and participants in the study. This research was guided by several ethical considerations with the first one being informed consent obtained after the research objectives were explained to the participants to which all approached study participants consented. Researchers' research skills assisted in the angle of respecting each respondents' view(s) as well as probing to clarify ambiguous responses so as to be sure of what a participant was actually saying. Confidentiality was adhered to by the research, not disclosing any data provided by the participants. Anonymity and confidentiality of responses were also guaranteed.

Results and Discussion

The following are the main AI chatbots commonly used by tertiary students in Zimbabwean universities.

DeepSeek

The study established that students were well alert and using recent AI chatbots such as DeepSeek. Deep Seek is a Chinese AI chatbot designed to assist users with tasks such as academic research, coding, content creation and document analysis (Dasgupta, 2025). According to Baptista (2025), DeepSeek's AI assistant is powered by DeepSeek-V3 and has overtaken rival ChatGPT to become the top-rated free application available even on Apple Store in the United States. DeepSeek focuses on delivering more detailed, nuanced answers and gives users the flexibility to ask more complex questions. Dasgupta (2025) alludes that if DeepSeek is asked a question, it may go beyond a simple answer to provide background information, reasoning and even offer suggestions on next steps, which can be very useful for users who need more detailed insights. Therefore, DeepSeek has been observed to be a little more lenient when it comes to certain controversial topics, giving users

a bit more freedom in their inquiries (Baptista, 2025). One of its latest advancements is DeepSeek-R1, which enhances the model's reasoning, problem-solving and data-processing abilities (Dasgupta, 2025). It aims to dig deeper into information, analyse data and provide more detailed accurate responses. This makes it particularly useful for tasks that require critical thinking, such as academic research, technical writing, or data-driven projects.

ChatGPT

Most students were quick to mention that ChatGPT was one of the best AI chatbots they used and they exhibited a clear understanding of this AI application. This is in tandem with Rudolph *et al*. (2023) who note that ChatGPT, launched in 2022 by OpenAI, is a large language model chatbot that generates text, produces diverse creative content and delivers informative answers to questions. It can be a valuable resource for students in various academic pursuits, from learning and research to writing and problem-solving. For example, students can use ChatGPT to get quick answers to questions across a range of subjects, which is particularly useful for homework and exam preparation. It can also help with brainstorming ideas for essays, projects, or presentations by offering topic suggestions, outlining structures and even providing draft content. Students also note that ChatGPT is useful to as it serves as a virtual tutor. This means that asking specific questions, students can receive explanations, breakdowns of complex topics and step-by-step guides, which can be helpful for understanding challenging subjects. ChatGPT is also used to learn new languages, practice conversational skills, or even translate text into different languages, aiding multilingual studies. It can also generate questions for practice quizzes and provide feedback on writing samples, helping students refine their grammar and style. Overall, ChatGPT's versatility and adaptability make it a useful tool for students seeking to enhance their learning experiences in a range of educational contexts. Students can use ChatGPT by installing the application or accessing it via a web browser without needing to sign up or create an account. The prompt section lets you explore topics, ask questions, give commands for specific content and even seek advice, all without hassle. The FGDs yielded that ChatGPT is one of the most used and trusted AI chatbot by tertiary students as alluded by participants from ZEGU, BUSE and ZOU.

Perplexity

The study findings also show that students are using Perplexity Al chatbot to enhance their learning experience. Perplexity AI is an advanced search engine and chatbot that uses machine learning and natural language processing to provide accurate and detailed responses to student queries. It is designed to perform real-time web searches, offering the latest information on a variety of topics, from academic research to current events. Its unique feature is its integration with generative pre-trained transformer (GPT) technology, allowing it to answer a wide range of questions with direct links to sources, which is crucial for students who need verifiable information for assignments or research papers. This emphasis on source citations sets Perplexity AI apart from other AI-based search engines, giving the students confidence in the reliability of the information. It pulls data from diverse sources, including academic databases, news outlets, YouTube, Reddit and the Wolfram Alpha physics and mathematics knowledge base, ensuring that students have access to a broad range of information, including recent academic papers. The search engine's focus on objective facts and data ensures response accuracy, which is ideal for students who need precise information for research projects. Apart from being free, Perplexity AI also offers a smooth and efficient search experience, with a mobile application providing on-the-go access, without additional installations. This makes it a great resource for students who require a reliable, cost-effective tool for gathering information with transparent source references.

Notion

Students also said that they had adopted Notion AI. Notion AI integrates artificial intelligence into the Notion AI workspace, offering students a robust tool for knowledge management, writing assistance and data processing. With its Q&A feature, questions can be asked within Notion AI and get instant answers from one's own wikis, projects and documents without opening additional browser tabs, saving you time during research or study sessions. This feature is particularly useful for students juggling multiple projects or seeking quick answers without disrupting their workflow. For students who write essays, reports, or any form of academic content, Notion AI helps to generate first drafts, rewrite complex jargon into simple language and even use

AI to translate text into various languages, making it a versatile tool for students in diverse disciplines. Its autofill capability can transform large datasets into clear summaries and action items, ideal for organising study notes or group project tasks. The platform also offers robust security, ensuring data privacy with encrypted transmission and strict permissions, providing a safe environment for academic work. Whether one needs to summarise lecture notes, draft essays, or create study plans, Notion AI offers customisable templates to streamline your student life. Notion AI is one of the most flexible workspace platforms, offering note-taking, project management and collaboration tools in one application. Its versatile collaboration features for team-based work can be explored and it can be integrated with other tools like Slack or Google Drive to streamline productivity. What works best for different users can be experimented with different organisational structures.

Poe

Platform for Open Exploration (Poe) is an innovative platform developed by Quora that facilitates user interaction with various AI chatbots, enabling a unique conversational experience across a wide range of topics. Launched to enhance the accessibility of AI technology, Poe allows users to engage with different AI models, each designed to provide answers, insights and assistance on diverse subjects, from everyday questions to complex inquiries. The platform's primary goal is to democratise access to artificial intelligence, making it easier for individuals to leverage AI for information gathering, entertainment and learning. Users can initiate conversations with multiple AI chatbots, each potentially equipped with distinct capabilities and knowledge bases. This multi-bot approach allows for varied perspectives and responses, enriching the overall interaction. Poe also emphasises user-friendly design, ensuring that even those with minimal technical knowledge can navigate the platform effortlessly. Additionally, the platform includes features that encourage exploration and discovery, such as topic suggestions and trending questions, which help users find relevant content tailored to their interests. As a result, Poe serves not only as a tool for obtaining information, but also as a space for curiosity-driven exploration, where users can delve into new topics, ask follow-up questions and engage in deeper discussions with the AI. Furthermore, Poe reflects a broader trend in the tech industry toward

making AI more integrated into daily life, highlighting the potential of AI to enhance human interaction, creativity and problem-solving. Overall, Poe represents a significant step in the evolution of AI engagement, combining accessibility, variety and interactivity in a single platform, making it a valuable resource for anyone interested in harnessing the power of artificial intelligence.

Gemini

Gemini AI, introduced by Google DeepMind in late 2023, marks a transformative leap in the realm of artificial intelligence, particularly in natural language processing and cognitive reasoning. This suite of models is designed to unify various AI capabilities, allowing for more sophisticated understanding and generation of human language. Unlike its predecessors, which often excelled in specific tasks, Gemini AI integrates these functionalities to create a more versatile and cohesive system. It utilises advanced deep learning architectures and has been trained on a vast and diverse array of datasets, enabling it to perform complex interaction, such as nuanced conversational exchanges and intricate problem-solving. Gemini's architecture is notable for its ability to reason through context, making it adept at understanding user intent and providing relevant responses, thus enhancing user engagement.

The model's versatility extends to applications in content generation, summarisation and even creative writing, showcasing its ability to adapt to various user needs. Furthermore, it emphasises ethical AI usage, incorporating safeguards to mitigate biases and ensure responsible deployment in real-world applications. This initiative is part of a broader trend in AI development, where the focus is shifting towards creating systems that not only react, but also engage intelligently with users, crafting an interactive experience that feels more human-like. Such advancements are paving the way for future AI applications that could redefine how we interact with technology in our daily lives (DeepMind, 2023).

QuillBot

QuillBot AI is an advanced paraphrasing tool and writing assistant that leverages artificial intelligence to enhance the writing process for users

across various fields, including academics, business and content creation. Launched in 2018, QuillBot employs sophisticated natural language processing algorithms to understand the context of the input text and generate rephrased versions that maintain the original meaning while improving clarity and fluency. One of its most notable features is the ability to provide users with multiple rewriting options, enabling them to choose the phrasing that best fits their style and intent. QuillBot also integrates seamlessly with popular writing platforms, such as Google Docs and Microsoft Word, enhancing its utility as a real-time writing assistant. Beyond paraphrasing, it offers additional functionalities, including grammar checking, summarisation and a citation generator, making it a comprehensive tool for improving written communication. The platform aims to assist users in overcoming common writing challenges, such as writer's block and repetitive phrasing, by encouraging more creative expression and aiding in the development of unique content. Furthermore, QuillBot is designed with user accessibility in mind, offering both free and premium subscription models to cater to various needs. Its commitment to enhancing writing quality while promoting ethical use of AI tools is a significant aspect of its mission, reflecting a broader trend in educational technology that seeks to empower users in their writing endeavours.

Aithor

Aithor AI is a cutting-edge writing assistant that utilises advanced artificial intelligence to enhance the writing process for a diverse range of users, from students and professionals to content creators and marketers. Designed to facilitate high-quality content generation, Aithor AI leverages natural language processing and machine learning algorithms to understand user inputs and provide contextually relevant writing suggestions. One of its key features is its ability to generate coherent and engaging text based on minimal prompts, allowing users to quickly develop ideas into well-structured articles, essays, or reports. Additionally, Aithor AI offers functionalities such as grammar and style checks, ensuring that the content adheres to linguistic standards while enhancing readability and fluency. The platform's user-friendly interface is designed to accommodate individuals with varying levels of writing experience, making it accessible and intuitive. Furthermore, Aithor AI supports multiple languages, broadening its appeal and

usability for a global audience. As users interact with the platform, Aithor AI continuously learns from their preferences and writing styles, enabling it to refine its suggestions over time. This adaptability is part of a broader trend in AI technology, which aims to empower users by reducing the cognitive load associated with writing tasks, promoting creativity and fostering more efficient content creation. By combining these features with a commitment to ethical AI practices, Aithor AI not only enhances productivity, but also encourages originality and critical thinking, making it a valuable tool in the modern digital landscape.

Llama

Large Language Model Meta AI (Llama AI), developed by Meta (formerly Facebook), represents a significant advancement in the field of natural language processing and machine learning, aiming to provide robust and versatile AI capabilities for various applications. Launched in early 2023, Llama) is designed with a focus on efficiency and accessibility, allowing researchers and developers to utilise its powerful language generation and understanding capabilities in diverse domains, including chatbots, content creation and data analysis. One of the standout features of Llama AI is its ability to understand and generate human-like text with remarkable fluency and coherence, making it suitable for tasks, ranging from casual conversation to complex problem-solving. The model is built on a foundation of extensive training using a diverse range of datasets, enabling it to grasp context, recognise nuances and engage in meaningful dialogue. Furthermore, Llama AI emphasises ethical considerations in AI deployment, incorporating mechanisms to mitigate biases and ensure responsible use in real-world applications. Meta has made Llama AI more accessible to the research community by providing open-source access, encouraging collaboration and innovation among developers and researchers globally. This approach aligns with a broader trend in AI development that seeks to democratise access to advanced technologies, fostering an environment where new applications and improvements can emerge rapidly; as Llama AI continues to evolve and it holds the potential to redefine interactions between humans and machines, paving the way for more intuitive and helpful AI systems across various sectors (Meta, 2023).

Grammarly

Grammarly AI is a powerful writing assistant that employs advanced artificial intelligence and natural language processing to enhance the quality and clarity of written communication. Launched in 2009, Grammarly has evolved significantly, offering features that cater to a wide range of users, including students, professionals and businesses. One of its core functionalities is real-time grammar and punctuation checking, which helps users identify and correct mistakes as they write, thereby improving the overall accuracy of their content. Beyond basic corrections, Grammarly AI provides style suggestions, vocabulary enhancements and tone adjustments, allowing users to tailor their writing to specific audiences or contexts. The platform's AI-driven algorithms analyse writing patterns and offer personalised feedback, making it a valuable tool for improving writing skills over time. Additionally, Grammarly integrates seamlessly with various applications, including web browsers, word processors and email clients, ensuring that users can enhance their writing across different platforms. The introduction of features like plagiarism detection and genre-specific writing style suggestions further solidifies Grammarly's position as a comprehensive writing tool. With a commitment to promoting effective communication, Grammarly AI not only helps users produce error-free text, but also encourages clear and engaging expression of ideas. As the demand for high-quality writing continues to grow in both academic and professional settings, Grammarly AI stands out as an essential resource for anyone looking to improve their writing proficiency and achieve greater success in their communication endeavours (Grammarly, 2023).

Bard

Bard, introduced in 2022, is a large language model chatbot created by Google AI. Its capabilities include generating text, language translation, producing various types of creative content and providing informative responses to questions. (Rudolph *et al*., 2023). Bard is still under development, but it has the potential to be a valuable tool for education.

Socratic

Socratic, launched in 2013, had the goal of creating a community that made learning accessible to all students. Currently, Socratic is an AI-

powered educational platform that was acquired by Google in 2018. While not a chatbot *per se*, it has a chatbot-like interface and functionality designed to assist students in learning new concepts (Moppel, 2018; St-Hilaire *et al*., 2022; Alsanousi *et al*., 2023;). Like with other chatbots, a concern arises where students might excessively rely on Socratic for learning. This could lead to a diminished emphasis on critical thinking, as students may opt to use the platform to obtain answers without gaining a genuine understanding of the underlying concepts.

Habitica

Habitica, launched in 2013, is used to help students develop good study habits. It gamifies the learning process, making it more fun and engaging for students. Students can use Habitica to manage their academic tasks, assignments and study schedules. By turning their to-do list into a game-like experience, students are motivated to complete their tasks and build productive habits (Sales and Antunes, 2021; Zhang, 2023). However, the gamified nature of Habitica could inadvertently introduce distractions, especially for students who are easily drawn into the gaming aspect rather than focusing on their actual academic responsibilities.

Piazza

Piazza AI is an innovative educational platform designed to enhance collaboration and communication among students and educators, creating a dynamic learning environment that fosters engagement and knowledge sharing. Launched with the goal of transforming traditional classroom interactions, Piazza allows users to post questions, share resources and discuss course materials in a structured format that encourages peer-to-peer learning. The platform utilises AI-driven algorithms to categorise and prioritise content, ensuring that the most relevant and frequently asked questions are easily accessible, which helps streamline the learning process. Students can benefit from the collective knowledge of their peers, gaining insights and support in real time, while instructors can monitor discussions, respond to queries and provide additional guidance as needed. Piazza AI also integrates seamlessly with learning management systems, making it easy for educators to incorporate it into their existing curricula. Features such as anonymous posting encourage students to ask questions without fear of

judgment, promoting a more inclusive atmosphere where everyone feels comfortable seeking help. Additionally, the platform supports various types of content, including text, images and links, allowing for rich, multi-dimensional discussions that cater to different learning styles. By leveraging technology to facilitate collaboration, Piazza AI not only enhances student engagement, but also empowers educators to create more interactive and responsive learning experiences, ultimately contributing to improved educational outcomes and a stronge1r sense of community within academic settings.

The opportunities of adopting of AI chatbots by tertiary students in Zimbabwe

Quick processing of scattered information

It was also established that AI has revolutionised the way students in tertiary universities access information by providing instant, accurate and relevant answers without the need for time-consuming researches. One of the lecturers who taught AI stated the following:

"Unlike traditional methods, where some of us, when we were students, spent hours sifting through library books, academic journals and preferred e-resources, AI-powered chatbots and virtual assistants deliver precise information in seconds. These systems are designed to understand natural language queries, allowing students to ask questions in their own words, just as they would to a human advisor. AI employs advanced technologies such as natural language processing (NLP), machine learning and vast knowledge databases to interpret the query, retrieve the most relevant data and present it in a clear, concise manner. This is the case with the recently launched famous Chinese DeepSeek AI which has sent shock waves to academia due to its massive reliability and efficiency outsmarting the previous best performing chatbots like the American ChatGPT in the AI world of competition."

Therefore, such revelations underscore that AI chatbots not only save time, but also reduce cognitive load, allowing students to focus on learning and problem-solving rather than information hunting. These revelations are in support of a study by Ondáš *et al*. (2019) who found out that chatbots can provide information without requiring extensive, time-consuming searches, while concealing the underlying complexity.

Improved Communication and writing skills

The study has showed that the use of AI powered chatbots has brought benefits to tertiary students. The study participants emphasised on how AI chatbots if used effectively can improve writing skills and enhance communication vocabulary of students in tertiary universities. In one of the FGDs, one student responded;

*"*To *spice up our written assignments and dissertation, we use Quillbot and Grammarly to run through our documents to correct grammatical errors and smoothen our language."*

One of the lecturers said:

"It is understandable that English is our second language in Zimbabwe, hence we cannot speak or write it fluently. The exegesis of these AI chatbots is very critical for our students to sharpen their communication and writing skills if they are to use it responsibly…"

These findings shed light on the importance of adopting AI chatbots by students in tertiary institutions which can, therefore, improve their skills as they prepare for real world experiences.

Access to real time information

The study also shows how AI chatbots have revolutionised the way students in universities access and interact with real-time information, transforming the educational landscape into a more dynamic and responsive environment. AI-powered platforms and tools, such as intelligent tutoring systems, virtual assistants and learning management systems, provide students with instant access to a wealth of information tailored to their specific needs. One participant stressed that:

"AI chatbots can answer student queries using up to date and current information. For example, I teach Social Sciences and issues are happening every second across the fast-paced globe so technically these chatbot are very much capable to provide these case studies thus putting students up to date with current events…"

Additionally, AI chatbots are capable of analysing vast amounts of data from online resources and academic journals to curate personalised content for students, ensuring they receive the most relevant and up-to-date information. The study thus submits that real-time feedback on assignments and exams powered by AI chatbots, allows students to identify their strengths and weaknesses immediately, enabling them to improve their performance efficiently.

Interpreting text and creating pictorial evidence

Another benefit which comes with responsible use of AI chatbots lies in its ability to interpret text and create pictorial evidence, revolutionising the way students approach presentations, thereby enhancing their ability to communicate ideas effectively and creatively. One of the students opined:

"Personally, I know AI-powered tools like Canva can create visually appealing presentations by offering templates, design suggestions and automated formatting, ensuring that my pictorial evidence is both professional and engaging. Other tools can facilitate the creation of original visual content through tools like Runway ML which generate images, illustrations, or even videos based on textual descriptions, allowing us as students to bring our ideas to life in innovative ways. As a fanatic of technology, I believe that as students we can save time, improve the quality of our presentations and focus on developing critical thinking and story-telling skills, ultimately making our work more impactful and memorable for the audience and, most importantly, to get better marks."

Such revelations further cement the benefits associated with the use of AI chatbots by tertiary students particularly in this modern technology led era.

Rough idea of a subject or concept

It was also discovered that AI has helped students to understand concepts and modules as it allows them to research to have a rough idea of the subject area or module. This means that the presence of AI chatbots can be used in different studies because it can simplify the most difficult concepts they might have failed to understand in lectures or answering questions to curious students regarding topics or concepts yet to be covered in a particular module. One student articulated that:

"I wonder why there are still universities that restrict students from using AI chatbots in this modern era as it is like parents restricting their children from using a mobile phone just because they are trying to protect them from the internet. The fact is, on the internet there is good and bad content, so what is needed is for parents to teach their children how to access good information and then figure out ways to protect them from the internet. Similarly, AI chatbots like ChatGPT, are like an upgraded version of Google Search; you use it for research purposes. So, for me, restricting it means people are refusing to develop because more and more technologies will come. That is just how it is, it is the technology world and we cannot run away from it so we need to embrace it."

This further beams the importance of using AI chatbots especially by tertiary students.

Easy access

It was also established that AI chatbots offered easy access to students exhibiting benefits to those who might need to study on certain topics. Chatbots were found to be a great asset to students who would want to study whilst using their smartphones at their will. The advent of chatbots created by Meta like Llama can be beneficial to students who would want to expand their knowledge base. One of the averred:

"Llama is an AI assistant available on the commonly used applications like WhatsApp. Everyone with WhatsApp is able to utilise this one and all it requires is that you have a WhatsApp data bundle which is its distinctive advantage compared to the other chatbots which require expensive general bundle. So, you can just study on your smartphone as almost everyone spends much of their time using their phones…"

These revelations attest to the fact that chatbots can benefit students by enabling them to carry out their studies while on their mobile smartphones, thus revolutionising education in Zimbabwe.

Pitfalls associated with using AI chatbots by tertiary students

Plagiarism

The study findings show that students using AI chatbots are more likely to plagiarise their written assignments and research projects, while claiming that they were the rightful originators of the work. One of the lecturers interviewed said:

"We now use Turnitin to check for similarity index and AI report. Most of the written assignments have a high rate of plagiarism and the percentage for AI is too high and unbearable…Some of these students can just generate the assignment on these AI chatbots on the day of submission and because they are racing against the deadline, they submit the AI generated text as it without any proper editing"

This shows the dangers that have been witnessed due to the use of AI chatbot by students. The fact that one can just generate text within seconds has resulted in the increase of plagiarism. Plagiarising at tertiary level is a serious academic and punishable offence and thus AI has increased the chances of committing such crimes by students.

Luddites

Through interaction with some of the participants, especially the librarians, this research also observes that another challenge on adoption of AI by students also lies amongst staff members themselves who happened to be luddites. Technology is here to stay and continues to make strides in the modern world that we are living in, to an extent that trying to avoid it, is impossible and futile. There is need for more workshops on capacity building so that staff members are educated and capacity to know that AI is not entirely evil and they are using it in the execution of their duties.

Destroys critical thinking

Students using AI were found to be lacking critical thinking as they were said to be depending entirely on AI. The danger associated with this challenge is producing poor graduates who have not mastered their subject area, thus awarding certificates to students who are not able offer solutions on the market. One of the participant lecturers alluded that:

"The danger nowadays is producing students who lack critical thinking capacity to solve current problems by offering goods and services in the market. They now depend on AI even for simple assignments, yet some AI responses are shallow as these are machines not people."

Another lecturer also made similar sentiments when she submitted that:

"Students forget these chatbots are nothing but just machines, hence no amount of machine learning can result in machines thinking exactly like humans. What they can only do is to simulate thinking and rational behaviour. In simple terms, humans can create machines, but machines cannot create humans. Therefore, machines do not have the advanced natural cognitive ability to make complex decisions like humans despite using complex algorithms and neural networks. Machines can carry out certain tasks very effectively but they can hardly explain how and why they do what they do, hence the area which humans have a competitive advantage and must use their critical thinking…"

These findings connote the reality that overreliance on the use of AI chatbots, particularly by tertiary students, destroys and undermines critical thinking which is the centrality of tertiary education, where students are instilled with critical thinking needed for the practical world.

Cram, pass, forget

The findings also show that the existence of AI chatbots such as Llama from Meta which is found on common applications such as WhatsApp, are very detrimental to the students using AI. Students are now in the habit of reading via this chatbot to prepare for in-class tests and examinations. They are also using other chatbots to create presentations and any other assigned tasks. It is strongly emphasised that this creates a cram-pass-forget package of students who pass modules which they have zero knowledge and understanding about. A lecturer from one of the selected universities was quoted saying:

"Despite the limitations associated with modular learning, AI chatbots have fostered students who are not aware of module content they have done in their previous blocks and semesters. The way most degrees are structured is that there are certain foundational modules which have content that keeps coming back until you graduate. Most of these students are not aware of such basics they have done and if you are to ask them, they will tell that we did not do that and this is because they cram to pass and then forget…"

These revelations underscore the challenges which emanate from the use of AI chatbots by students at tertiary institutions. Therefore, there is need to put in place mechanisms that can address these challenges as a matter of urgency.

Laziness/ Dependency

The study reveals that AI chatbots have instilled laziness into students who no longer have time to do thorough research and reviewing of books, journals and online resources. One lecturer equivocally stated:

"Students just put a question as it is on the interface of a chatbot and it generates information within seconds and in most cases, the information lacks depth and proper referencing as AI chatbots can put non-existing references or falsify the year of publication."

Similar sentiments were shared by one librarian who submitted that:

"Very few students now borrow books from the library and their activity on e-library resources is very slim. AI has destroyed the hunger by students to access library resources and you only get to see an influx of students during exams week."

Such findings illustrate the dangers associated with the use of AI chatbots by tertiary students. Laziness robs potential students' ability to excel and strike high module grades which will eventually affect the overall score for the graduate.

Substandard research projects

Another challenge that is laid bare by this study is the coming up with poor research projects by some students, giving their supervising lecturers. Lectures in this study bemoaned that some students would just go on AI chatbots and produce their work and then submit, claiming it to be their work. A concerned lecturer stressed that:

"Work unedited from AI is very easy to see if you are keen to read through. AI has a way it structures its sentences and a chronology it uses to craft certain words in paragraphs. Sometimes, the chatbots can even tell you that it does not have knowledge beyond a specific period or ask the student to edit the produced draft to suit his or her own needs. Sadly, most students do not read thoroughly and as you are supervising a student, you then come across such paragraphs where the chatbot has produced wors which is incomplete and calling for human input. In my experience, mostly women are in the habit of failing to read thoroughly. So, imagine if such a project is to be circulated and people say look at the types of researches this institution is producing...that destroys the reputation and image of institutions."

This shows that AI chatbot usage by tertiary students has repercussions, particularly on final year students be carrying out their research projects or dissertations. The findings lay bare that some lazy students can just put the whole topic on these chatbots to create objectives, questions and other critical elements of the project, thereby weakening student's ability to create their own research problem, objectives and questions. This affects the credibility of students to carry out authentic and practical world dissertations which can offer a new piece of knowledge to the existing body of literature.

Reliability and Accuracy

The study also finds that another challenge associated with the use of AI chatbots is that at times, it provides biased responses or non-accurate information. The challenge here is that if the chatbot provides incorrect information or guidance, it can then mislead students and hinder their learning progress. One of the participants vividly expressed concern when he said:

"Well, from my experience with these AI chatbots like Poe and ChatGPT, I have discovered that they provide false information and scholars who are nowhere to be found, or worse, scholars who have written something totally different from the quoted topic or area. Students must, therefore, be very careful, especially when referencing using these chatbots as the danger lies in providing

non-existent scholars thereby undermining the credibility and authenticity of their work."

These findings are in agreement with scholars such as Sevgi *et al*. (2023) who allude that although chatbots like ChatGPT have exhibited captivating and thought-provoking answers, they should not be regarded as a reliable information source.

Fair assessments

Another challenge noted by this study is on the torrid time faced by university lecturers on assessing student's work, particularly written assignments. Despite the gradual improvements in AI text detection with the submission of written assignments on Turnitin software, it is not yet foolproof and can produce false negatives or positives. Students themselves have now devised ways to cheat and beat Turnitin, so that it provides positive results. This can create uncertainty undermine the credibility of the assessment process as lecturers may struggle to discern whether the responses are genuinely student-generated or if they have been provided by an AI chatbot. This will, therefore, affect the accuracy of grading and feedback.

*"Written assignments are now submitted via Turnitin classrooms for AI text detection. Technology is evolving on a daily basis and students have ways to manoeuvre through to an extent that an AI-generated text cannot be detected. New applications have also been produced which are used to cheat Turnitin detection by students. For example, on AI chatbots like Edit pad, you can change the language of a plagiarised or AI text generated document, say to Russian or any other language, convert back to English and the margin of that document to be detected on AI becomes slim. Students can also put **, "" and other symbols and this can reduce detection. So, all these are ways which then undermine our ability to fairly assess a student's work and provide accurate grading and feedback."*

Similar sentiments were also echoed by scholars such as Kung *et al*. (2023) and Al Afnan *et al*. (2023) who aver that educators face a huge challenge in the integration of chatbots into education and faces the difficulty of assessing students' work. This therefore raises concerns about academic integrity and fair assessment practices.

Ethical issues

Another challenge associated with the use of AI chatbots is on ethical implication. Fear on the issues concerning data privacy, security and responsible use of AI chatbots were discussed by the participants as they expressed a serious concern on this aspect. As AI chatbots interact with students and gather data during conversations, necessitating the establishment of clear guidelines and safeguards.

"Most of these chatbots, although not all of them, require that you register details like phone numbers, email accounts and other personal details in some instances unaware where they will work or if it is just data harvesting. These chatbots also can discuss issues outside education, allowing students to use these chatbots irresponsibly."

This study corroborates findings by scholars such as Masters (2023), who cautioned the use of AI chatbots based on ethical issues implications. Masters (*ibid.*) articulates that medical education frequently encompasses the acquisition of knowledge pertaining to delicate and intimate subjects, including patient confidentiality. Therefore, ethical considerations within the medical field and thus ethical and proper utilisation of chatbots, hold significant importance.

Recommendations

The study proposes three main recommendations to mitigate the risks and maximise the benefits of AI chatbot adoption.

1. Staff and Student Training. Universities must invest in workshops to educate both staff and students on the responsible ways of adopting and using AI. This is essential to curb the rise of "luddites" (those resistant to technology) and ensure ethical use.
2. Develop Referencing Standards. Universities should urgently develop clear referencing systems that allow students to properly acknowledge AI chatbots as sources in their academic work, addressing the plagiarism concern.
3. Promote Human-AI Fusion. Tertiary students are strongly advised to "fuse AI with human capacity", meaning they must use AI as an augmentation tool and resist the culture of relying

solely on AI chatbots to maintain critical thinking and intellectual rigor.

Conclusion

The research ultimately concludes that the adoption of AI chatbots within Zimbabwean tertiary institutions presents a complex duality, functioning simultaneously as "a curse and a blessing" for students. On the positive side, these tools—including widely used platforms like ChatGPT, DeepSeek and Gemini demonstrably enhance the learning experience by fostering the development of higher-order cognitive skills, aiding in exam preparation and overcoming skill gaps through augmented and personalized learning. However, this convenience is undermined by significant pitfalls, as reliance on AI chatbots promotes intellectual laziness and dramatically increases the risk of plagiarism, while technical limitations like outdated or shallow information and the financial constraints of accessing premium services remain substantial concerns for students.

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