Understanding the Generative Artificial Intelligence Revolution in Zambian Higher Education Research: Adoption, Challenges, and Strategies for Responsible Integration

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ABSTRACT

Generative Artificial Intelligence (Generative AI) continues to transform several sectors, including education, agriculture, and healthcare. In Zambia, the adoption of Generative AI in the education sector has been significant. This paper explores the level of awareness and adoption of Generative AI tools by students, lecturers, and researchers in Zambia. The paper also discusses the challenges of ongoing adoption and integration efforts, especially the ethical issues surrounding the use of Generative AI in research. Using a qualitative document analysis research approach, this paper argues that while Generative AI offers increased research productivity and efficiency, the lack of clear guidelines and policies for its adoption and integration continues to pose a challenge. The paper advocates for clear policies, training programs, and digital infrastructure development to guarantee the responsible and equitable integration of Generative AI in research.

Keywords: Generative AI, Research, Zambia, Ethics, Adoption, Technology Acceptance Model.

INTRODUCTION

The rise of Artificial Intelligence (AI) introduces opportunities and challenges for the education sector. Artificial Intelligence (AI) is reforming the teaching, learning, assessment, research, innovation and industrialisation processes. Generative AI is a subfield of artificial intelligence. According to Scapicchio and Stryker (2025), "Generative AI, sometimes called gen AI, is artificial intelligence (AI) that can create original content such as text, images, video, audio or software code in response to a user's prompt or request". Based on sophisticated machine learning models, Generative AI can create new content by learning from existing data. The rate at which the global research landscape is being reshaped and revolutionised through Generative AI is unprecedented (Organisation for Economic Co-operation and Development, 2025; Chaamwe, 2024).

Generative AI tools and capabilities can assist students, lecturers and researchers with literature reviews, hypothesis generation, data analysis and manuscript drafting. In a context such as Zambia, where educational institutions strive to enhance research output, the potential of Generative AI is enthralling. Although its integration in Zambia's higher education is likely to reshape the research landscape, several challenges persist. Major challenges include the digital divide, ethical considerations and lack of adequate training for students, lecturers and researchers on the use of Generative AI for research purposes (Internews, 2024; Munshya, 2025).

Technology Acceptance Model (TAM)

Originally proposed by the American information systems researcher Fred Davis in 1986, the Technology Acceptance Model (TAM) is often employed to understand how people come to accept and use new and emerging technologies. When Fred Davis developed the framework, the main aim was to predict and explain the attitude and behaviour of individuals towards new and emerging technologies in organisational settings. The framework is based on two core constructs, namely Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). Perceived Usefulness (PU) underlines the belief that using a given system would enhance performance, whilst Perceived Ease of Use (PEOU) is rooted in the perception that using the system would be effortless (Lee, Ramasamy and Subbarao, 2025:250). Based on the Technology Acceptance Model, "these two

factors are the primary determinants of our intention to use a technology, which in turn predicts our actual usage behaviour…if we believe that a technology is useful and easy to use, we're more likely to adopt and use it" (Enablers of Change, 2023).

From the perspective of user acceptance, TAM can be used to explain the extent to which PU and PEOU influence an individual's attitude, intention to use, and eventually, actual system use. The framework is often used due to its clarity, predictive power, and ease of application across different technologies and settings. The approach emphasises individual perceptions over technical features. This makes the framework a key model in human-computer interaction and technology adoption research generally. This study has utilised the Technology Acceptance Model (TAM) to understand the factors influencing the adoption of Generative AI in the research landscape in Zambia (Barteit et al, 2019; Mweemba and Kalimaposo, 2022). For example, researchers, lecturers and students are more likely to use Generative AI tools if they are convinced that they are beneficial for enhancing their research goals and are easy to use (Chaamwe, 2024; Miyoba and Kafula, 2023).

Awareness and Adoption of Generative AI

Globally, the adoption of Generative AI is increasing across various sectors. The global Generative AI market, which is valued at $44.89 billion, has been projected to reach $1.3 trillion by 2032 (Howarth, 2025). In terms of adoption, "GenAI is gaining traction at an even faster pace: 33% of organisations adopted tech in 2023; 65% reported usage by March 2024; 71% reached adoption by July 2024…Looking ahead, 92% of businesses plan to increase their investments between 2025 and 2027", showing continued adoption rates (Master of Code Global, 2025). Like many countries in Sub-Saharan Africa, Zambia has continued to adopt artificial intelligence in various sectors. The Oxford Insights Government Artificial Intelligence Readiness Index (2023) ranked Zambia 143rd out of 193 countries in terms of AI readiness (Munshya, 2025). The position of Zambia on the ranking suggests that it is taking positive steps to formalise its AI vision and strategy.

On 11 March 2024, the Government of Zambia endorsed the United Nations General Assembly's *Resolution Seizing the Opportunities of Safe, Secure and Trustworthy Artificial Intelligence Systems for Sustainable Development* (Thomson Reuters Foundation, 2024). This was a major resolution adopted by the United Nations on artificial intelligence. On 24 October 2024, the Government of Zambia, through the Ministry of Technology and Science, launched the National Artificial Intelligence Strategy (2024-2026). According to the Centre for Intellectual Property and Information Technology Law (2024), the strategy was introduced to "drive economic growth, enhance public services, and position Zambia as a hub for AI-driven development in emerging economies" while ensuring that AI adoption aligns with international best practices and ethical standards. The National AI Strategy provides a comprehensive roadmap for adopting and advancing digital transformation through AI in different sectors, including education, healthcare, agriculture, mining, and public services. According to Felix Mutati, Minister of Technology and Science, the "vision is for Zambia to become the premier destination for 'AI for Emerging Economies' ventures— through closer engagement with the private sector and global research networks, Zambia will become a place where innovators come to build their AI-driven businesses" (Ministry of Technology and Science, 2024).

Moreover, the Ministry of Education and other relevant regulatory bodies such as the Zambia Information and Communications Technology Authority (ZICTA) remain proactive on AI in education, research and innovation. The Zambian government has therefore been contributing to the awareness and adoption of artificial intelligence, including Generative AI, in Zambia. The Ministry of Education and several universities in Zambia have recognised the transformative potential of Generative AI in research and are taking steps to ensure its integration into the education sector. During a summit held at Mulungushi University in May 2025, Minister of Education, Douglas Siakalima, emphasised the government's commitment to "integrating AI in higher education, enhancing learning through smart classrooms, personalised teaching, and ethical safeguards" (Ranjan, 2025). Globally, Generative AI continue to be explored and implemented in different aspects of higher education, including research, innovation, automated administrative tasks and personalised learning (Tembo, 2025; Ranjan, 2025). The integration of AI in higher education will contribute to the improvement of accessibility, relevance of the curriculum and more robust teaching, learning and assessment strategies. For example, Generative AI is increasingly being employed by students, lecturers and researchers to enhance their

research efforts (Munshya 2025). This is partly due to the increasing awareness of Generative AI tools among students, lecturers and researchers.

Several studies have demonstrated the relevance of Generative AI in enhancing research productivity by automating repetitive tasks such as manually searching for relevant sources, accelerating data analysis processes and providing editorial assistance (Organisation for Economic Co-operation and Development, 2025; Munshya, 2025). A Zendy (2025) survey found that "73.6% use AI in education, 51% use it for literary review and 46.3% of students and researchers are using AI in education for writing and editing". This indicates that the number of students, lecturers and researchers using Generative AI tools when conducting research is relatively high. The same study revealed that Generative AI tools in research are generally being used for correcting grammar, generating ideas, reviewing literature, summarising articles, suggesting research areas and topics, brainstorming and data analysis. The common Generative AI tools used by students, lecturers and researchers when conducting research include SciSpace, Research Rabbit, Connected Papers, Elicit, Litmaps, Scite AI Assistant, Explainpaper, Paperpal, QuillBot, Grammarly, ChatGPT, Gemini, Claude, Perplexity AI, Mindgrasp, Trinka, DeepSeek, Runway, and Poe Chatbot. In a study on the use of Generative AI in Zambia, Nchimunya Chaamwe (2025:47) found that "there are high levels of awareness (88%) and adoption (82%) of Generative AI in learning by students in Universities and there was a relatively high usage frequency (51%)". In this case, the levels of awareness of the existence of various Generative AI tools are high.

Students working on assignments, presentations, projects and dissertations use Generative AI in their research projects and other forms of formative and summative assessments due to its benefits, usefulness and efficiency (Chaamwe, 2025:47). For example, Masters and PhD students working on their dissertations might free versions of tools such as ChatGPT, Grammarly and Elicit for thesis brainstorming, summarising relevant texts, generating draft research questions, and refining certain argument structures. Through Generative AI, students can brainstorm on their research areas and topics, formulate draft research questions, and easily understand complex theories and concepts for theoretical and conceptual frameworks (Lubbungu and Siame, 2023). Generative AI tools such as Grammarly can improve the student's writing quality through grammar and spell-checking, as well as suggesting stylistic improvements.

The level of Generative AI awareness and adoption among lecturers and researchers is also high in Zambia, though its actual usage in research remains relatively low, partly due to uncertainty and the lack of clear guidelines and policies on academic standards (Miyoba and Kafula, 2023; Chaamwe, 2025). Researchers and lecturers are gradually exploring and integrating Generative AI in various ways to enhance their research work, including book projects, book chapters and journal articles. In this case, Generative AI tools such as Gemini and Poe Chatbot can be beneficial when generating research ideas, drafting research questions and when searching for the latest literature on the research area during literature review (Miyoba and Kafula, 2023). In data analysis, some researchers and lecturers in research are already experimenting with tools such as Julius AI when analysing the collected data, customising charts and graphs and performing statistical tests (Internews, 2024; Sililo and Mayumbo, 2024). Generative AI tools can also support lecturers and researchers in formulating the research hypothesis for research projects, thereby ensuring that the research is focused and impactful. When drafting grant proposals, Generative AI tools can help by summarising previous works, providing outlines for research plans and highlighting the potential impact of the research.

Challenges in Adopting and Integrating Generative AI for Research

The adoption of Generative AI in higher education research in Zambia is still in its early stages, with several challenges hindering this process (Munshya, 2025; Sililo and Mayumbo, 2024). The first major challenge in the integration and adoption of Generative AI for students, lecturers, and researchers concerns the limited awareness and knowledge acquisition strategies, such as training sessions, workshops, and seminars on the use of Generative AI for research purposes (Modiba, Van den Berg and Mago, 2025; Internews Network Zambia, 2024). This exposes a substantial gap in AI training and literacy for students, lecturers and researchers. Similarly, the lack of awareness of Generative AI tools can also be attributed to limited knowledge on the relevant tools for research and the actual technologies and devices, especially among rural students, lecturers and researchers (Lubbungu and Siame, 2025). There are also limited awareness workshops, seminars and

training sessions on the adoption and integration of Generative AI in research at universities for students, lecturers and researchers, especially on the use of Generative AI tools and their application in research and innovation.

The second challenge to the adoption and integration of Generative AI in Zambia by students, lecturers and researchers concerns digital infrastructure limitations. Internews (2024) and Sililo and Mayumbo (2024) have found that there is limited digital infrastructure in Zambia, including the digital divide, insufficient internet bandwidth, unreliable power supply and limited access to computers and digital devices. Some parts of Zambia often experience such challenges due to the erratic and unreliable internet connectivity and access (Kanyemba et al, 2024; Modiba, Van den Berg and Mago, 2025). This has led to the digital divide in the adoption of Generative AI. In its official statistics, the Zambia Information and Communications Technology Authority (ZICTA) reported that there were "12.6 million internet subscriptions, representing 64.1% penetration (subscriptions per 100 inhabitants)" as of December 2023 (Frąckiewicz, 2025).

However, independent findings reveal a lower usage rate. For example, statistics presented by Datar portal showed that while about 7.13 million people used the internet in Zambia at the start of 2025, the actual online penetration remained relatively low at only 33 per cent (Kemp, 2025). In rural areas, digital ICT infrastructure and network access to support the use of Generative AI tools in research are among the key barriers to the adoption and integration of Generative AI in research. In some cases, there is limited funding for technology procurement and a shortage of training sessions and programs on the effective use, implementation and maintenance of technology, including Generative AI tools (Zambia Sharda University, 2025; Mulenga, 2020; Internews, 2024).

Moreover, the lack of clear policies and guidelines on the ethical and responsible use of Generative AI tools in research remains a challenge in Zambia and other parts of Africa (Munshya, 2025; Chaamwe, 2024). Policy and ethical uncertainty, including clear guidelines on the ethical and unethical use of Generative AI, escalates the overreliance and abuse of Generative AI by students when completing their assignments, presentations, projects and dissertations. At a summit on Generative Artificial Intelligence (GenAI) in higher education held at Mulungushi University in May 2025, Douglas Syakalima, Minister of Education, noted that "Generative AI, when properly handled, offers immense promise for enhancing access, quality, and relevance in higher education. However, we must also address concerns around ethics, equity, and governance as we navigate this transformative technology" (Tembo, 2025). Douglas Syakalima's sentiments show how the use of Generative AI tools in research raises questions of plagiarism and compromised academic integrity. In some cases, students, lecturers and researchers heavily rely on AI-generated content without conducting the actual research and proper understanding of the use of Generative AI tools.

Several studies have demonstrated that the major implication of overreliance on Generative AI by students, researchers and lecturers when conducting research is that critical thinking, analytical and evaluative abilities, innovation and problem-solving skills are not applied (CBSEGuess, 2025; Farangi, Nejadghanbar and Hu, 2024). In some cases, the use of the 'copy and paste' approach when using Generative AI can lead to superficial engagement with the material, reduced capacity for independent thinking, the spread of misinformation, and the erosion of trust and academic integrity in research (Farangi, Nejadghanbar and Hu, 2024). The use of Generative AI tools in research also raises questions of intellectual property infringement and lack of responsible use, thereby promoting academic misconduct. Moreover, the attempts by the government and several universities to enact clear policies and regulations on the use of AI tools in research are still in their infancy. The absence of such polices and regulations creates uncertainty among students, lecturers and researchers conducting research either as part of their academic programmes or for publication, thereby hindering the effective and responsible adoption of Generative AI in Zambia (Ranjan, 2025). Well-defined guidelines and policies will enable stakeholders to resolve ethical concerns and ensure accountability and responsible use of Generative AI in research.

Strategies for Integration of Generative AI in Research

Ensuring the responsible, ethical, and equitable integration of Generative AI in higher educational research in

Zambia and beyond is important. Firstly, universities and research bodies should develop and implement clear guidelines and policies on the ethical and unethical use of Generative AI in academic research. The guidelines and policies should address issues such as academic integrity, plagiarism, transparency, responsible use and accountability. This is important because "researchers need to make sure AI-generated content meets academic integrity standards" (Zendy, 2025). The launch of the National AI Strategy (2024-2026) by the Zambian government is a positive development in this process. The government, regulatory bodies and universities should also accelerate the process of issuing clear regulations on the use of Generative AI in educational research to ensure consistency and adherence to quality standards. In addition, universities will require relevant monitoring and evaluation strategies to track Generative AI awareness, adoption, integration and the related challenges in research (Thomson Reuters Foundation, 2024). In this process, feedback from students, lecturers and researchers plays an important role in developing and adopting guidelines, policies and training material on the use of Generative AI in research.

Moreover, structured and robust training programs and capacity-building workshops, seminars, and webinars for students, lecturers and researchers should be designed and implemented at all universities throughout the country. The training sessions must include the technical use of Generative AI tools such as ChatGPT, Elicit, Grammarly, critical analysis of the generated content and responsible and ethical considerations when conducting research. The government, regulatory bodies, and universities can also partner with international organisations to create AI centres for capacity building and training on the use of Generative AI in research. Such training sessions should be sensitive to the digital divide, focusing not only on urban areas but also on rural areas where there is limited access to the internet and digital devices to access Generative AI tools.

For example, on 5 September 2024, the Zambian Ministry of Technology and Science announced that Zambia had partnered with Google to launch an Artificial Intelligence (AI) Centre of Excellence at the Zambia Research and Education Network (ZAMREN), housed within the premises of the University of Zambia (Bilali, 2024). Such as partnerships show how collaboration between universities, government, and international organisations can facilitate resource sharing and investment in AI. Furthermore, there is a need to invest in digital infrastructure and access by expanding internet access, especially in rural areas. Financial constraints can be partly addressed through collaboration and knowledge sharing between the government, regulatory bodies, universities and other stakeholders. Collaboration between universities to share resources, develop tools and manuals, and best practices is also important in developing awareness and ensuring responsible adoption and integration of Generative AI in research.

CONCLUSION

The transformative potential of Generative AI in higher education research cannot be underestimated. Generative AI has the potential to revolutionise research in Zambia by automating routine tasks and enhancing efficiency and productivity. Regardless of the advantages, challenges such as academic misconduct and limited digital infrastructure persist. Thus, harnessing the transformative potential of Generative AI requires a strategic and holistic approach that addresses the unique challenges and ethical considerations in research. Through collaboration between the government, universities and local and international partners, focus should be directed towards investing in digital infrastructure, providing relevant training, and developing policies and guidelines on the use of Generative AI in research. This will enable students, lecturers and researchers to harness the power of Generative AI and its potential in enhancing research productivity, promoting innovation, and contributing to national development.

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