

Influence of Generative Artificial Intelligence on Blended Learning and Research in Institutions of Higher Education: Opportunities and Risks

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Introduction

Artificial Intelligence (AI) is becoming a pervasive entity in modern developed societies. It is a significant factor in marketing, design, and entertainment, and is also increasingly present in institutions of higher learning. Many AI systems exist and are operating behind the scenes in large numbers affecting a variety of aspects in current civilization. According to Daniel *et al* (2024), a major development in AI occurred in the year 2022 when the San Francisco-based company OpenAI released to the public their Chat Generative Pre-Trained Transformer (ChatGPT). ChatGPT is classified as a Large Language Model (LLM) Chatbot that leverages Natural Language Processing (NLP) to create human-like responses to users' prompts. The study further argued that new technology has already had a significant impact on the education industry and has prompted an upward surge of other numerous generative AI tools. While only a few flagship smartphones can currently be considered GenAI phones, the uptake across the globe has registered a slow growth. Apple company is expected to add generative AI



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features to some existing iPhones, meaning Apple could soon be the company that has the highest number of GenAI phones on the market despite having precisely none today. Counterpoint's research (2024) points indicate that while in 2024 only 11% of smartphone shipments are expected to be GenAI smartphones, by 2027, 43% of all smartphone shipments are expected to be GenAI smartphones. It is also expected that the number of GenAI phones in use in the world will exceed 1 billion devices for the first time.

According to Hu (2023), GenAI such as the ChatGPT tool was rapidly adopted by the general public and reached over 100 million users in the first quarter after its public release, hence making it one of its kind and above all the fastest-growing consumer application ever. The ultimate influence of AI cannot be predicted, at least for now. However, a study conducted by Bozkurt (2023) posits that GenAI has the potential to trigger transformative changes across the divide. Scholars from different disciplines including Thurzo, Strunga, Urban, Surovkova, and Afrashtehfar (2023) agree that GenAI is poised to have a more substantial influence than the introduction of electricity during the second industrial revolution era.

While generative AI has the potential to revolutionize education, some challenges need to be addressed. Glaser (2023) identifies some of the challenges such as accuracy and reliability of generated content. The study argues that generative AI models can produce realistic but inaccurate content. It states that it is important to develop mechanisms to ensure the accuracy and reliability of generated content, especially when it is used for educational purposes. The incorporation of generative AI in education increases ethical concerns and challenges which include but not limited to the potential for cheating, plagiarism, and teacher displacement (Al-Smad (2024); Adiguzel, Kaya., & Cansu. (2023); Dwivedi et al., 2023). In response to this concern, Susarla *et al.*, (2023) suggests that it is imperative to develop ethical guidelines to safeguard integrity in education and to educate students about proper ways and good use of generative AI.

Within the field of education at all levels, GenAI tools have recently caused industry-wide concern. Xiromeriti and Newton (2023) for example opine that ChatGPT has

been observed to be able to pass exams in medicine while Monahan, & Schwarcz, (2023) observed that the tool is in a position to distinctively answer law questions and English comprehension (de Winter 2023) as well as many other disciplines. On the same breadth, Walczak and Cellary (2023) asserts that AI-enabled tools of this type are not without fault and typically produce illusions that can only be considered as errors with deceptive plausibility and misalignment with truthful information. Regarding their comparative study of the reliability of three LLMs in presurgical planning, decision-making, and patient education, Seth *et al.* (2023) found that Google Bard delivered the most concise and understandable information followed by ChatGPT. Google Bard is an AI Chatbot which has been developed at Google to resemble human-like communication through the use of Natural Language Processing (NLP) and Machine Learning (ML).

When the education sector across the globe was only just beginning to grapple with the implications of GenAI, the current study attempted to ascertain the influence of engaging with GenAI on learning, teaching, and research in institutions of higher education in Kenya. The motivation behind the current study is to help understand the current perspectives of the lecturers with the ultimate goal of helping inform policy direction and begin to identify what best practices might look like when engaging with these emerging technologies. Lecturers and students were surveyed regarding their experiences on the topical issue. This outcome of the current study will report on the perspectives observed in the respondents' survey and follow-up interviews to address the research question.

Statement of the Problem

Generative Artificial Intelligence (GenAI) has the potential to revolutionize higher education by offering powerful tools for content creation, personalized learning, and automated feedback. However, this transformative technology also presents significant challenges that require careful consideration. Generative AI is a new frontier for learning institutions. Within the education realm, most of the contemporary discussions occur in higher education and focus on policy development, pedagogy, and new content delivery methodologies. There is a serious lack of relevant studies on

what future education should be, particularly in institutions of higher learning in Kenya. Generative AI tools are emerging, interfering, and disruptive, thus offering opportunities and risks alike. (Yau *et al.*, 2023) argues that lecturers' perspectives are crucial for making sense of any innovative technology for learning, teaching, assessment, and administration. Through an empirical literature review on how generative AI influences education, Angelov *et al.* (2021) highlighted the shocking bias against using digits in numbers within generative AI tools. The key findings of this study show that the most popular numbers generated by generative AI tools like ChatGPT are also the most popular in human preference hence suggesting that there is a thin line between the two extremes. Many of the previous studies that have been done in the past have revolved around the influence of general AI in other critical sectors of diverse economies. Preliminary research has shown that there has been a limited focus on specialized AI technologies and in particular the generative AI tools in education. One of the unique approaches adopted by the current study is the constructivist theory of learning. This theory is employed as a framework to explain the merits of the technology in question. The central problem lies in harnessing the potential of generative AI to enhance learning outcomes in higher education while mitigating the associated risks. This requires a comprehensive approach that addresses ethical considerations, promotes responsible use, and fosters a future where AI complements, rather than replaces, human educators. Integration of GenAI tools into classrooms raises both exciting possibilities and significant challenges. This problem statement explores the multifaceted effects of generative AI on themes such as teaching methods, learning outcomes, assessment practices, academic integrity, and ethical considerations. By examining these questions, the study attempts to propose strategies to leverage the benefits of generative AI while mitigating potential risks. This will ensure that AI fosters a more effective and equitable learning environment for all students in the higher education sector. With this in mind, the current study was conducted to determine the influence of generative AI tools on teaching and learning in institutions of higher learning in Kenya.

General Objective of the Study

The general objective of the study was to determine the influence of generative AI on teaching, learning and research in institutions of higher education in Kenya.

Specific Objectives of the Study

- i. To determine the perspectives of lecturers and students regarding the influence of generative AI on teaching, learning, and research in institutions of higher education in Kenya.
- ii. To ascertain the risks of generative AI on teaching and learning in institutions of higher education in Kenya.

Research Questions

- i. What are the perspectives of lecturers and students regarding the influence of generative AI on teaching and learning in institutions of higher education in Kenya?
- ii. What are some of the risks associated with generative AI that affect the quality of teaching and learning in institutions of higher education in Kenya?

Literature Review

Theoretical Framework

Constructivist Theory of Learning

Qureshi et al., 2021 argue that the constructivist theory of learning is a widely accepted educational philosophy that significantly influences modern learning and teaching processes and models the traditional and virtual classrooms. The origins of constructivism can be traced back to the scholarly works of Dewey (1929), Bruner (1961), Vygotsky (1962), and Piaget (1980). Li (2022) and Qiu (2019) identify the definition of learning and the approach to learning as the two main essential components of constructivism learning theory. In support of the above statement,

Taber (2011) emphasized that these essential elements should be integrated into an optimal learning environment for students. According to this theory, learning is a dynamic process of knowledge construction shaped by students' needs, learning materials, tools, and the overall learning environment. According to Qiu (2019), it is worth noting that lecturers play a leading role in the teaching process by addressing students' needs, providing relevant learning materials as well as offering helpful tools. Ma and Tsai (2021) found that constructivist education emphasizes self-learning and study, while traditional teaching focuses on acknowledging lecturers' or teachers' experiences. Bada and Olusegun (2015) opine that constructivism is a theory rooted in observing and systematically investigating how individuals acquire knowledge, drawing inspiration from fields such as philosophy, psychology, sociology, and pedagogy.

Makewa (2019) clearly illustrates the relevance of constructivist theory in technology-supported knowledge transfer, be it eLearning or AI-driven teaching and learning. In support of the constructivism approach, Adar and Kandemir (2008) argue that technologies in the learning process enable students to manage their skills and knowledge to decide exactly what they require to address their knowledge gap. With this clarity therefore, the current study concludes that generative AI-powered tools have the potential to facilitate a constructivist learning experience for students in both traditional and virtual classrooms by enabling them to explore and experiment with ideas, ask questions, and receive immediate feedback that allows them to construct their understanding of knowledge. It is worth noting that the constructivism learning theory can be considered while discussing GenAI's benefits and risks in the higher education sector. According to Schunk (2012), the constructivist theory of learning emphasizes the importance of learners who are actively exploring and investigating new knowledge. In essence, the study argues that GenAI can facilitate the process in question. It is worth noting that by engaging students in conversation and encouraging them to participate in the learning process, GenAI can help synchronize their prior knowledge and experiences to help them construct new knowledge.

Geng and Razali (2020) believe that this feedback can help students find errors and guide them to improve, making GenAI a great tool in education. In his early education studies, Wiggins (1990) noted that constructivism theory places greater emphasis on the importance of authentic assessment that measures students' ability to apply their knowledge and skills to the real world. Integrating GenAI into digital teaching, learning, and assessment processes can help students construct knowledge. GenAI tools can provide personalized feedback by modeling students' experiences and experiences, guide students to complete remediation, and help them identify errors in their work. This feedback acts as an MKO that supports the development of new knowledge. Another outcome is adaptive learning. Schunk (2012) believes that transfer of learning is an important idea of constructivist theory, which believes that learning is built upon prior knowledge. Shiu (2012) defines adaptive learning (AL) as a learning method that adjusts learning to the specific needs of students through feedback and resources. Kerr (2016) defines adaptive learning in an online learning environment as a method of presenting learning materials in which the student interacts with previous content to determine the nature of the material that is then delivered. Adaptive learning uses computer algorithms and technology to provide self-help and learning activities. However, Peng et al. However, the current study points out that through the transformation of education taught by Deng and Yu (2023), the transformation transforms students from beneficiaries to collaborators. From the theoretical background, it is clear that learning is based on prior knowledge, and knowledge based on prior knowledge leads to the construction of new knowledge. For example, by integrating GenAI's application programming interface (API) into a school's Learning Management System (LMS) in a virtual learning environment, instructors or lecturers can create student-centered and proactive personalized learning based on students' prior knowledge. This claim is supported by a study by Chen *et al.*, (2023). More importantly, many studies show that students receive personalized, immediate feedback from GenAI tools, rather than simply providing easy-to-understand explanations, while also supporting exploration of relationships between models and providing access to learning and content needs. As a result, teachers can create customized lesson plans through GenAI tools such as ChatGPT, thus

encouraging more thinking and knowledge creation. On the other hand, Stapleton and Stefaniak (2019) and Rudolph *et al.*, (2023) reiterate that discussions of generative AI tools not only help students develop their skills as they continue to study, but also encourage them to experiment and try. Learning from such experience is an important part of creating knowledge.

Bearman, Ryan, and Ajjawi (2023) noted that the rapid developments of AI in higher education is influenced by three important factors: the introduction of Open AI's ChatGPT and the COVID-19-induced phenomenon has increase the usage of virtual learning, including skills adoption. This is more important in developing countries (Al Dhaen, Stone, & Mahmood, 2022). Adamopoulou and Mousiades (2020) discuss the use of cognitive skills in traditional classrooms in general. How artificial intelligence can be used for learning purposes and its impact on teaching and learning in higher education using the ODeL model is still unclear to many instructors, especially those in the African continent. The study authors have somehow managed to evaluate how AI is changing teaching and learning and how they report their successes and failures. There is also some debate about the benefits of artificial intelligence in traditional classrooms and virtual classrooms and specific methods of improving artificial intelligence teaching (Jungwirth & Haluza, 2023). Boateng and Tindi (2022) investigated the results of teaching artificial intelligence in the classroom in their study. In this study, phenomenology, a qualitative method to evaluate participants' opinions in various environments, was used. The result shows that the introduction of artificial intelligence into the classroom can bring many advantages and disadvantages for students and instructors. Some tips are shown on how to use the best technology and avoid the consequences it may cause. While most participants agree with AI, some educators and researchers are concerned about what it will mean for their businesses. However, engineers see artificial intelligence as a tool that will improve quality and benefit everyone in education. At the same time, lawyers and legal professionals are more concerned about the potential problems of intellectual property in law and education (Mamani, *et al.*, 2022).

On the flipside, the utilization of learner-centered generative AI tools such as Deep Tutor and Auto Tutor, has been shown to cultivate custom and personalized content based on the learners' ability and requirements, thereby enhancing the learning experience, and potentially leading to more successful learning outcomes for students studying online (Johnson, Nadas, & Bell, 2010). Furthermore, Sharma., Kawachi., and Bozkurt (2019) argue that the advent of ODeL education has given AI the ability to develop enhanced learning tools for educators and to optimize outcomes for students across geographical boundaries, using AI-based language translators such as Google Translate. The use of AI in education is becoming *modus operandi*, and its encroachment and influence on online teaching and learning is a topic of interest for researchers, lecturers, and students. ChatGPT is one such generative AI tool that has been trained on big data to generate human-like responses to questions and prompts. Using the theory of disruptive innovation as a foundation for the current study's argument, the study explored the potential and possible disruption of generative AI tools in online teaching and learning. Naidu and Sevnarayan (2023) contend that while the use of AI in online teaching and learning presents a myriad of possibilities and limitations, it is crucial to approach its use with caution and consider the ethical implications of academic integrity in digital learning.

Chang *et al.* (2021) dug more into this technology and the breadth of AI in various fields, emphasizing its application in education. The study discusses its definition, search tactics, developments, and future. In analyzing the results of various experimental instantiations, reported in more detail elsewhere, Chang and Kuo (2021) hinted at some of the more speculative answers, first in principle, then in implementation. In support of the study done by Harper et al., (2003), the current study finds its preposition valid because AI is fundamentally different from human intelligence in how it operates and what it accomplishes, and it will never assume the role of a lecturer in the context of electronic computing techniques developed in the past. The scope of the limitations considered by the current study may have the potential to change education in ways that make it more acceptable in terms of its usage. According to Fadhil and Villafiorita (2017), there is a two-standard-deviation improvement in performance between students who receive private tutoring in digital

space and those who use more conventional teaching methods, as reported by Bloom's taxonomy in 1984.

In their study, Flanagan *et al.*, (2023) and Thorp (2023) observed that many institutions of higher learning, particularly Universities, have started exploring how to incorporate this AI-driven solution into their pedagogical approach, recognizing its potential to transform new teaching methods such as ODeL thus enhancing student involvement, and fostering customized educational experiences. However, some academics and researchers express concerns regarding the potential ethical consequences of using GenAI in educational environments, such as information privacy, algorithmic bias, and the possible reduction of human interaction, among others. Consequently, the current study is actively investigating the most efficient and responsible methods to integrate generative AI tools into digital teaching and learning.

According to Bearman *et al.*, 2023, institutions of higher learning have a responsibility to provide their students with the latest, efficient, and relevant learning tools. These institutions also have a responsibility to respond to the rapidly changing technological landscape, which includes AI as an increasingly prominent feature. Thurzo *et al.*, (2023) observed that to prepare students for industry, it is imperative to have learners understand at least basic principles and terminology regarding AI technologies). In support of this premise McGrath, Pargman, Juth, and Palmgren (2023) affirm that institutions of higher learning also have a responsibility to provide equitable education to all students in both the traditional and virtual classrooms, and as such, GenAI is seen as being able to assist in such provision. In a rather interesting thought, Thurzo *et al.*, (2023) suggest that curriculum content and pedagogical practices at institutions of higher learning need to be revised and updated in light of the recent AI revolution.

According to McGrath *et al.*, (2023), educators in institutions of higher learning are typically slow to adapt to new technologies due to resistance to changing teaching practices. For many academics, GenAI is as much a threat as an opportunity. A common theme among the conversations around AI in education is a fear that AI could, or even will, replace educators. Bearman *et al.*, (2023) describe this as just one aspect of a “dystopia-is-now” perspective on artificial intelligence technologies in institutions

of higher learning. A major concern regarding artificial intelligence technologies in institutions of higher learning is the potential for students to plagiarize its products (Alhaidry, Fatani, Alrayes, Almana & Alfhaed, 2023). This process even has been christened “AIgiarism” (Murugesan & Cherukuri, 2023). Further predisposed predictions include undermining scientific pursuits (Bozkurt, 2023; Dergaa, Chamari, Zmijewski, & Ben Saad, 2023), privacy and ethics concerns ([Lodge](#), Thompson, & Corrin, 2023), perpetuating biases (Cooper, 2023) and spreading false information (Murugesan & Cherukuri, 2023).

Chiu and Chai, (2020), opine that many instructors either do not know how to use GenAI as a teaching tool or are simply opposed to using it in their classrooms. Crawford *et al.*, (2023), suggest that one of the main drivers for this lack of interest is the fact that additional hours will need to be put in learning how to adequately use GenAI. According to research, educators all over the world seem to rely more on incentives or rewards like recognition, promotion, and financial rewards and not on incentives like happy teaching and learning, better learning, and improvement of the quality of teaching. As such, they often and cautiously approach AI subject. In support of this premise, McGrath *et al.*, (2023) argue that many educators feel GenAI tools are still too early in their development and not accurate enough in their information retrieval or delivery to be used in learning and teaching contexts. There are also differences across user types when it comes to adopting AI tools. For example, women report less knowledge about AI than men (McGrath *et al.*, 2023). Wang *et al.* (2023) pointed out that some AI-based speech recognition and dictation tools may put at a disadvantage some students who do not speak their native language or who have very strong accents, which could lead to accent and dialect-related misunderstandings or misinterpretations.

However, all is not lost. Among the divergent views in the academic divide is the ability of AI tools to positively influence students’ creativity and self-efficacy (Wang, Sun, & Chen 2023) and personalize learning (Bozkurt, 2023). Mogali (2023) explains that personalized content has been demonstrated to enhance the learning experience and lead to more successful outcomes for students. GenAI such as the ChatGPT was

also observed to assist in medical training by surfacing novel and non-obvious concepts that may not be in learners' sphere of awareness (Kung *et al.*, 2023). Data collected from respondents by McGrath *et al.*, (2023) revealed that students from vulnerable groups, including those with learning disabilities, could benefit from AI assistance. AI has an impact on what it means to be an educator (Firat, 2023) and is changing how we see the job of human instructors (Bozkurt 2023). Chiavaroli, (2023) argues that educators in institutions of higher learning context should adjust both teaching and modes of assessments to enhance the students' outcomes while simultaneously safeguarding against unethical use of generative AI. For this to occur, Bearman *et al.*, (2023) recommend that institutions of higher learning need to set strong policies and support continuous research agendas that are capable of addressing AI concerns including ethical implications.

Method

Mugenda and Mugenda (2012) describe research methodology as the plan of how the study is going to be conducted. This chapter describes the research design and the methodology that will be used in the study. It describes the methodological framework to be used to attain the objectives of the study. The research approach adopted in this study comprises four key stages; research design, data collection, data analysis, and report writing, all of which adopted a mixed method research approach. Qualitative research methodology aimed at comprehending the decision-making processes and actions of individuals or groups and explaining the occurrence of specific phenomena as suggested by Siripipattanakul *et al.*, (2022) and Viphanphong *et al.*, (2023).

Research Design

Kothari (2014) states that a research design serves as a blueprint, guide, and framework for a research strategy to address a research question. It forms the basis for all research endeavors. On the same breadth, Creswell (2017) defines research design as a structured plan of investigation aimed at obtaining answers to research questions. This study leveraged descriptive research and correlation survey research designs respectively to collect both qualitative and quantitative data. According to Kombo and

Tromp (2016), descriptive research design is concerned with the systematic collection and analysis of data with the ultimate goal of describing the current state of affairs. It involves measurement, classification, analysis, comparison, and interpretation of data. This survey is designed to elicit both qualitative and quantitative data. Surveys were circulated amongst, and modified by the researcher to ensure face validity. No questions were compulsory, and there was an average response rate of 99.7%.

Population

Mugenda and Mugenda, (2019) define a population as a complete set of individual cases or objects with some common observable characteristics. Yin (2017) describes a population as the set of sampling units or cases that the researcher is interested in. In summary, all the above scholars agree that a target population is the whole set of units from which the survey data is to be used to make inferences. For this study, the unit of analysis was selected institutions of higher learning in Kenya from which the lecturers and students who participated in the study were derived from.

The respondents were selected using purposive sampling, considering their characteristics and experiences relevant to the study. The study utilized technique to select 300 key informants (150 lecturers and 150 students), a widely recognized qualitative research method that involves deliberately selecting a sample based on the researchers' expertise that best suits the study's objectives. According to Zickar and Keith (2023), this approach aims at gaining an in-depth understanding about the population or phenomenon under study. The presences of the lecturers from the higher learning institutions were due to their experience and expertise as well as familiarity with the subject under study.

Data Collection Instrument and Procedure

According to Creswell (2002), information gathering is the method by which data is acquired from the chosen subject of an examination. This study gathered information using closed and open-ended online questionnaires with the help of a SurveyMonkey

online instrument. A questionnaire is a tool designed for the collection of data, usually measuring certain aspects. Dawson (2016) observes that there are three basic types of questionnaires which include close-ended, open-ended, or a combination of both. Close-ended questionnaires are used to generate statistics in quantitative research while open-ended questionnaires are used in qualitative research. Orodho (2009) observes that questionnaires have the major advantage of time efficiency and anonymity. A total of 300 questionnaires were disbursed. Informed consent was obtained from the respondents, and the researchers scheduled and conducted interviews in comfortable settings, respecting the respondents' preferences. Open-ended questions provide the opportunity for self-expression openly and honestly thus representing different responses in reference to interaction with any of the GenAI tools. This research employed the data randomly collected from chartered Universities in Kenya. The data was refined in Microsoft Excel and imported to SPSS for further analysis and descriptive statistics.

Results

Response Rate

Morton, Bandara, Robinson, and Carr (2019) define response rate as the total number of completed interviews about the total number of participants with whom contact is made, or the number of all possible interviews. As stated earlier, a total of 300 online questionnaires were administered, out of which 299 were properly filled, submitted back, and were therefore found suitable for analysis. This represented an overall response rate of 99.7% as shown in Table 4.1.

Table 1. Response Rate

Response	Frequency	Percentage
Received responses	299	99.7
Unreturned responses	1	1.3
Total	300	100

According to Bonevski, Magin, Horton, Foster, and Girgis (2018), a response rate of 70% and above is adequate for analysis and reporting in survey studies. This view is supported by Fincham (2022) who advocates for a minimum of 60% and Mugenda and Mugenda (2018) recommend a minimum of 50%. Based on the foregoing, the 99.7% response rate that was attained in this study and as such, it was found to be above the recommended minimum and therefore it was adequate for making inferences concerning the characteristics of the population under study.

Reliability of the Data Collection Instrument

Cronbach's coefficient alpha was used to determine the internal reliability of the research instrument used in this study. Sekaran and Bougie (2016) argue that the alpha values range between 0 to 1.0. The value 1.0 indicates perfect reliability, and the value 0.70 is considered to be the lower level of acceptability. The reliability values for each of the variables are presented in Table 4.2 where it is evident that Cronbach's alpha values for each of the study variables were well above the lower limit of acceptability of 0.70. The findings indicated that lecturers' and students' perspectives on GenAI had a coefficient of 0.834, and risks posed by GenAI had a coefficient of 0.833, and teaching and learning had a coefficient of 0.812. The results therefore showed that the questionnaire used in this study had a high level of reliability.

Table 2. Reliability of the Data Collection Instrument.

Variable	Cronbach's Alpha
Lecturers' and students' perspectives of GenAI	0.834
Risks posed by GenAI	0.833
Teaching and learning	0.812

Descriptive Analysis

The current study presents findings using the Likert scale tool. The respondents were asked to give the level to which they agreed or disagreed with statements on each variable. A 5-point Likert scale was organized as follows; 5 = Very Frequently; 4 = Frequently, 3 = Neutral; 2 = Less Frequently; 1 = Very Infrequently. The results

provided by the respondents were analyzed and the findings were interpreted using means and standard deviation values.

Lecturers' and students' perspective of GenAI on Teaching, Learning, and Research

Respondents gave their considered opinions on statements relating to their perspective of GenAI on teaching and learning and the results obtained are presented in Table 4.3

Table 3. Lecturers' and students' perspective of GenAI on Teaching, Learning, and Research

Statement	VF	F	N	LF	VINF	Mean	Std Dev.
I am using, or planning to use, generative AI in teaching duties, research, and administration	4.8	1.6	4.8	69.3	19.5	3.967	1.169
I am using, or planning to use, generative AI research duties	3.3	3.3	8.1	73.1	12.2	3.878	1.224
I am using, or planning to use, generative AI in administration duties	1.6	4.8	8.9	77.2	7.3	3.837	1.305
I am using, or planning to use, generative AI in my research and studies (students)	5.7	3.3	9.8	70.7	10.6	3.772	1.176

n = 300 (VF = Very Frequently; F = Frequently; N = Neutral; LS = Less Frequently; VINF = Very Infrequently) *Mean = (VF = 1 – 1.8; F = 1.8 – 2.6; N = 2.6 – 3.4; LF = 3.4 – 4.2; VINF = 4.2 – 5.0)

Results in Table 3 show that the standard deviation values are small (<2) which suggests that the respondents did not have differing opinions. The findings further show that the respondents stated that they are either using or planning to use generative AI in teaching duties, research, and administration (M=3.976, SD=1.243).

Overall, the principal findings from data analysis indicate that 84% of the respondents find GenAI to be an educational tool par excellence, enhancing learning, teaching, and research. This is coupled with increased productivity, enhanced motivation, and better organization, which provides time management and facilitates a more effective and

collaborative learning environment. Current research shows that most lecturers are fairly educated on the appropriate use of GenAI. This is the reason why 59% of the respondents answered in the affirmative. It was noted that such narratives as responsible use, and targeted use following the principles of ethics do not disturb student learning at all since 54% of the respondents gave an affirmative response for this. Finally, 33% of the lecturers showed skeptical attitudes and were afraid that students need to be educated, and there could also be problems with the long-term use of GenAI. In contribution, the current study presents the outcome of our qualitative and quantitative content data analysis as follows.

The Influence of GenAI on Teaching and Research Domains

Respondents were tasked to indicate whether they were using, or were planning to use, generative AI in three respective fields of the University ecosystem, that is; administration teaching, research, and learning. The most common of these four areas was teaching, in which 43.3% (n = 130) of participants indicated they were using GenAI. Administration tasks were less frequent (26.7%, n = 80), research tasks were less infrequent (20.0%, n = 60), and learning activities (students) were very infrequent at n 10.0%= 30. None of the respondents stated they had used AI in any significant mode in research. Most of them had tested GenAI's ability to complete assessment tasks. Survey participants were asked to indicate, via a 5-step Likert scale, how frequently they use GenAI to support their work. Only 10 respondents indicated they had never used generative AI. twenty respondents indicated they used AI daily. The most typical response was "Very Infrequently (a few times a semester/year, or less)" with 38.5% (n = 5) of respondents selecting this measure.

When asked to list the GenAI tools they have used in the last year(s), all respondents (n = 130) listed ChatGPT. Other AI applications listed by respondents include Bing AI, Midjourney, Dall-E (an AI system that can create realistic images and art from a description in natural language.), Grammarly, Research Rabbit, Otter, Elicit, Jenni and Gemini. Figure 4.1 shows the summary number of respondents using each tool listed.

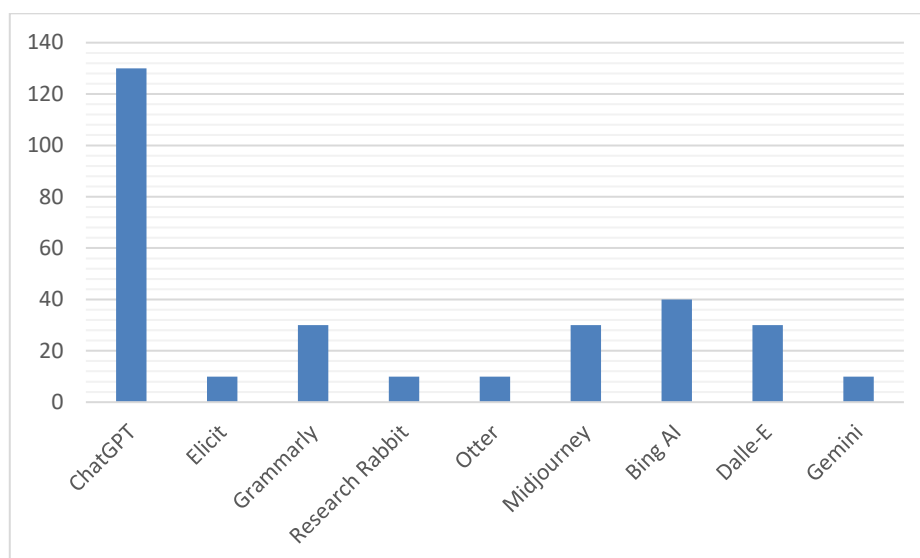


Figure 1 Summary number of respondents using different GenAI tools

ChatGPT's supremacy as a prominent generative AI tool has been **corroborated** by data collected from the respondents. When asked how they have engaged with AI, respondents, particularly in the fields of Arts, Business, Law, and Economics stated that they have always been leveraging ChatGPT GenAI as their best choice. Respondents from other academic departments agreed to this premise. 6.7% of the respondents further stated they had also experimented with Bing AI. Demonstrating a strong feeling of comfort regarding the use of AI, 30% (n = 90) of the respondents indicated that they were either somewhat, or extremely comfortable using generative AI-based tools to support their work. No respondents were extremely uncomfortable and only two (15.4%) indicated they were somewhat uncomfortable. No interviewees expressed discomfort regarding engaging with GenAI. In general, the respondents had positive experiences regarding the influence of using AI, often around the concept of saving time or mental effort.

The participants were further instructed to indicate tasks where they had used AI assistance. The most common response of 33.3% of the total respondents (n = 100) was to test AI's capabilities to complete their assessment tasks. The next most common responses were to assist in administration tasks 20.0% of the total respondents (n = 60) and generate new assessment tasks 16.7% of the total respondents (n = 50). The

respondents were further requested to list other activities. 3.3% of the total respondents ($n = 10$) stated that they use AI to format reference lists, however, they did not demonstrate which application they used for this particular task. The current study made reference to the study findings of Alkaissi and McFarlane (2023) which argued that the ChatGPT AI tool is known to perform poorly at such kinds of tasks. Other tasks mentioned by respondents included using GenAI to generate code and paragraphs for bureaucratic reports. These data suggest the influence of AI is broad, adding further challenges to policy design in institutions of higher learning.

The Influence of GenAI on Skills Development Domain

The respondents were asked to indicate to what extent they feel their respective University has equipped them with the necessary knowledge and skills to effectively use AI in general. Moreover, they were tasked to indicate whether or not they would like support in learning how to use generative AI. 20% of the total respondents ($n = 60$) agreed that the university has sufficiently equipped them while 70% ($n = 210$) indicated that they would like support. The responses regarding the kind of support the staff would like to be given were varied. They confirmed that the management should conduct a series of trainings on ethical ways of using GenAI to design, conduct, and write up research, how to do so appropriately and efficiently, and get more of a sense of the breadth of teaching activities that GenAI can support. There was a general sense of unknown among the responses with no specific detailed explanation of the type of support they felt they needed. Demonstrating the existence of a gap in the training and support currently offered by the university, 70% ($n = 210$) of the total respondents specified that they believe, or strongly believe that the generative AI-based tools can enhance their work. Figure 4.1 illustrates this gap.

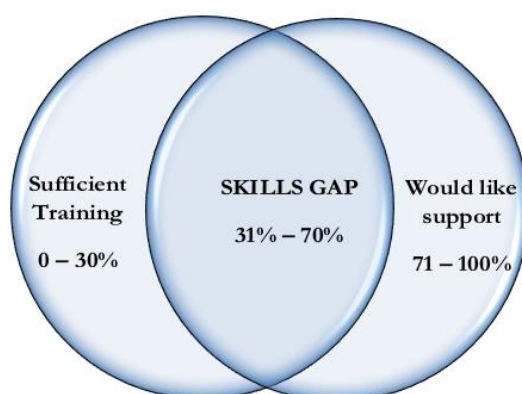


Figure 1. Gap between adequate training and desired support

On the question of capacity building, 20% of the total respondents ($n = 60$) indicated they have undertaken some professional development regarding GenAI tools. However, when asked to what extent they feel they have the necessary knowledge and skills to effectively discuss the use of GenAI-based tools and technologies with their students, only 33.3% ($n = 20/60$) selected either ‘agree’ or ‘strongly agree’ from the 5-point Likert scale. Only 16.7% ($n = 10/60$) of the respondents who indicated they have undertaken professional development also selected either ‘somewhat agree’ or ‘strongly agree’ that they have the knowledge and skills. This indicates that professional development has not been principally successful. Figure 2 illustrates this gap in professional development and its success.



Figure 2. Professional Development in GenAI

This was also a common thread among the respondents who typically felt they needed more training and to spend more time engaging with GenAI tools to get used to such.

Effect of GenAI on Students' Learning Domain

The respondents were tasked to indicate using a 4-point Likert scale tool, how often they believed students were using GenAI in their learning activities. Notably, none of the respondents selected 'never'. The majority (70%, $n = 210$) indicated they believed students were using AI either at least once a month or once a week. Figure 4.3 shows the frequency the lecturers believe students to be using the GenAI tools.

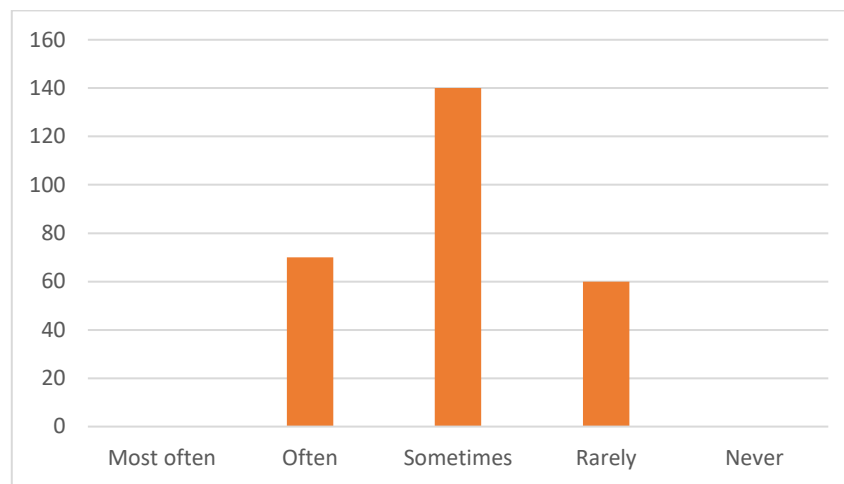


Figure 3. Perspective on the use of GenAI tools by Students' Domain

Respondents particularly from departments of Sciences expressed multiple concerns regarding the use of GenAI tools by Students. They argued that some of the students use the Grammarly GenAI tool so much that in the end, it's almost not their work. They also noted with concern that a couple of students have come forward to inform them that their student colleagues were using it during tutorial activities. They further confirmed that these students expressed their regrets and that they were uncomfortable that other students were doing so. However, data suggests that lecturers may have been overestimating the student use of GenAI tools. From the students' perspective, 33% ($n = 99$) of students who participated in the current study stated they had never used AI, and 25.7% ($n = 77$) had used it very infrequently which means either a few times a semester, or a year or even less. Some of the lecturers participating in the study were tasked to poll their respective students and surprisingly, they found out that more students than they expected indicated they had not used any of the GenAI tool(s). A

lecturer in the Business and Economics departments recalled a workshop they recently attended where students expressed their reservations about the use of GenAI tools as they feel that leveraging such tools may diminish the value of their degree certificates. A lecturer in the Department of Social Sciences observed that students in their 2nd, 3rd, and 4th year of university already had the skills to write assignments, essays, projects, or thesis and that they didn't need to access any of these GenAI tools. A lecturer in Molecular Biology argued that they have advised their students that they can use GenAI tools in exceptional cases and suggested that there needs to be a focused part of the inductions for first-year students to inform them of the opportunities and risks as well as correct use and management of GenAI tools. These data suggest that the influence of GenAI on student outputs may be smaller than expected. A glaring theme among the respondents of the current study when discussing student use of generative AI was one of transparency. Some lecturers asked their students to make sure they know why they are using GenAI tool(s) and also be in a position to demonstrate how they have used it if at all they're going to use it/ them. Similarly, other lecturers asked their students as part of the rules of engagement of using GenAI such as ChatGPT in their course to be transparent.

Influence of GenAI on Curriculum Design

The respondents were asked to indicate whether had modified their course design at some point in time in light of the generative AI. The observation made demonstrated a near 50% split (Yes: 48.1%, n = 130; No: 51.9%, N = 140). A common narrative that featured was modifications to assessments using a variety of assessment methods, new assessment questions, and application of knowledge assessment tasks. Other shrewd responses included changing essay topics to ones that rely more heavily on fieldwork and using GenAI tools to generate poor-quality written drafts with students then tasked to improve the content. However, nearly two-thirds of the respondents (63%, n = 170) indicated they had not provided information to students about how to use generative AI. All of the respondents reported having discussed with their students the proper use of GenAI tools and what they could and could not do, with an emphasis on caution and integrity.

For in-depth analysis, respondents were asked to show if they have modified assessments to increase resilience to GenAI at any given stage. Some respondents indicated that they were not concerned about this because according to them, the whole process proves to be broader and that it appears a fairly significant issue simply because course summative assessments no longer work. Forecasting a positive engagement with GenAI, the respondents concluded that they are going to have to think about how they will re-focus the assignments much more significantly to more explicitly enable them and support them to engage with GenAI. Some commented that they are torn between two extreme worldviews and will wait to see what happens with their subsequent first-year students, observing the first-years are probably a lot more adept and in touch with such kinds of technologies. Another influence on assessment designs includes minor developments. One-third of the respondents remarked that being much clearer about the types of references that are required can reduce the percentage of that assessment and bump up others. They also felt that more focus on the value addition of what it is that human-generated content can add. Some lecturers have either made more dramatic changes or intend to shortly.

While discussing assessments, the topic of GenAI detection tools was often raised by the respondents. 50% of the respondents expressed little trust in Turnitin as an AI detection tool and none gave positive feedback. They observed that the technology is changing so rapidly in all spheres that any detection tool that is developed would be outdated within months. This is evidently an issue that has not been sufficiently addressed and will undeniably influence future curriculum design and assessment practices as educators implement practical measures to avoid this problem.

Perceived Risks Associated with GenAI on Teaching and Learning in Institutions of Higher Education.

The most notable question in the questionnaire required the respondents to state whether they have any concerns with the use of generative AI in learning, teaching, and research. The overwhelming majority translating to 89% of the total respondents (n = 240) selected 'yes' which then allowed them to explain their considered concerns. Prominent across the responses were concerns related to plagiarism and the accuracy

of AI content. Other concerns raised include the potential to limit/displace student learning, avoiding experiential learning processes, and implicit bias in data sources used to train GenAI. Others stated that over-relying on such tools can change authentic practice in almost every discipline.

Worries and concerns about GenAI were the most frequently populated code from the scheduled interview data. However, there was no homogeneous theme among the concerns with the respondents expressing a variety of issues including copyright and ownership, student use of GenAI tools, lack of regulation, inaccuracy of GenAI tools, and literacy abilities. Some respondents asserted that people only get better at things the more they do them and stated and argued that if they all start using AI to help them with their writing, then their general ability to write as a population will start to drop. Other respondents noted that average multiple-choice test scores had risen sharply for the Class of 2023 and said they were concerned because the average multiple-choice test score seemed to have held fairly constant over several years. To justify their premise, they observed that the average score used to be between 69% and 76% but now the average scores this time round range between 80% and 90%. According to them, such statistics indicate that their students seemingly use GenAI tools to assist them with the assessment(s).

One-third of the respondents were concerned because they do not think governments and other policymakers are keeping up with the speed at which AI-enabled applications are developing. They expressed a concern that they do not know what happens to their data which they feed into GenAI tools. However, they then demonstrated another common issue, that of not knowing enough about GenAI. This unknown element is echoed in almost all responses put forward by the respondents. Lecturers remarked that Universities in the world are graduating students and sending them into industry with a parchment that says the University thinks this student is competent in this, and has deep discipline knowledge in this field. Majority of the respondents feel that generative AI is too easily accessed and predicts over the next two to three years' time students will become increasingly adept at the use of GenAI tools beyond even what they are capable of. Concerns of this kind were shared by the

skeptical lecturers within the current study, stating that at some future point in time, their students, who currently take up more time than such tasks actually deserve, would actually outperform them. They are concerned that educators may be left behind because they have not caught up on the technology as much as others or are afraid to engage with it. Respondents are certain that a gradual creep of GenAI into academia will remove a little bit of autonomy without the authorities really realizing in a sense. In the broader social and political contexts, majority of the respondents believe that GenAI can turbocharge a lot of the problems that are already created by social media.

Perceived Benefits of GenAI on Teaching Learning and Research in Institutions of Higher Education.

Respondents were asked to explain their expected potential benefits as a result of the use of generative AI technologies. 50% of the respondents (n=150) highlighted key areas as efficiency, time-saving, and reducing their workload. Other notable responses included accurate marking, brainstorming ideas, and developing potentially researchable questions for essays, projects, and theses. Majority of the respondents suggested that GenAI technologies offer the opportunity to work at higher levels of abstraction. The use of GenAI as a writing tool was also prominent in the findings. The concept of saving time and GenAI tools was strongly reflected in the data collected from the respondents. The respondents further expressed that if GenAI is used wisely, it could be a great time saver. On the same breadth, they also noted that they could potentially lead to people being sheepishly slothful. Other potential benefits listed by the respondents include speeding up the processing of data, and designing multiple choice questions to “free us up for doing more of the higher order stuff. Another respondent recalled occasions where they might ask a colleague to proofread work or examine a rubric design because they might look at it slightly differently. They suggested that GenAI could stand in for that colleague. Speaking about the potential benefits for students interacting with GenAI, the management science lecturers argues that students who learn how to use such a technology as a true learning tool will always have their horizons and potential dramatically expanded. However, they also warned that students who use GenAI to dumb themselves down will succeed in doing so.

Interview questions about the future influence of generative AI in institutions of higher education returned mixed responses with both positive and negative connotations. 63% of the total respondents (n = 190) indicated they do not think the use of generative AI in teaching, learning and research could lead to a dehumanization of education. However, 70% of the respondents (n = 210) remarked that they were concerned that its use in teaching, learning and research could lead to students becoming overly reliant on technology. The respondents were then asked demonstrate to what extent they think the growing use of generative AI in institutions of higher education can influence the future of work and employment within the universities. Indicating a complete lack of any coherent consensus on the subject matter, responses were as varied. Slight minority felt that there no changes in the whole gamut while the majority proclaimed that there is indeed enormous influence on content, assessment, process, jobs, academic roles and equity. These observations can be better summarized by unpredictable future and unforeseeable realities of the GenAI tools.

Some of the more insightful responses regarding the future influence of GenAI in institutions of higher education included rejoinders like there is a likelihood of rapid access to information that is likely to be exacerbated by GenAI and that current generations of generative AI tools may be redundant in as little as a few months' time. Or it could collapse, retreat to a certain extent, and again move forward in another form at some point in the future. Majority of the respondents believe that GenAI can enhance learning if students are taught to use it properly. However, others believe that universities will struggle to ensure academic standards. Another commonly held belief was that general artificial intelligence would not be much different from a host of other technological developments taken from the past, such as calculators, laptops, or the internet. They contended that It will become another tool to extend thinking. Others however argued that the tools will need to be managed by humans, which will lead to new employment roles, including handling increased academic integrity issues. Perhaps the most useful response was from the lecturer of computer sciences who commented that it is dangerous to make predictions based on current conditions

thought in relation to what they currently know and/or what they already have at their disposal.

When asked about the future influence of GenAI in institutions of higher learning, and in their respective disciplines, interviewees returned a range of both optimistic and pessimistic outlooks. Respondents argued that GenAI might allow them to think slightly differently about problems. 20% of the respondents wondered whether sufficient research might help them to identify ways in which they leverage GenAI that they haven't thought about yet, that would then lead to new innovations. However, they also observed GenAI is already being used in the biomedical field for tasks including experiment design, speeding up repetitive tasks in analysis, and looking for patterns in data samples. They stated that there are real dangers there and they have to be aware of them. However, they went on to argue that institutional governance will be too slow to respond to the GenAI phenomenon and concluded that they have enormous potential now to actually just get on with stuff and to take the initiative.

The final question in the survey provided the participants with an opportunity to discuss any additional comments they would like to make. Some of the respondents observed that most academics are not ready to embrace GenAI in their teaching and suggested that more mandatory professional development should be provided. Others suggested that the majority of discourse contains mostly negative connotations and feel that there is need for more positive discussion. 60% further suggested that if GenAI can make parts of their job easier or less time consuming, then maybe more time can be dedicated to working on strategies to engage students. Other concepts highlighted by the respondents include exploring GenAI together with the students. They indicated that they always explore with students in the courses and that they think they are doing their best to incorporate the students in this conversation.

Despite individually, a third of the respondents demonstrated a common approach to engaging the students with GenAI. In spite of marginal indifference in details, there was a common pattern of either allowing the students to draft an essay using GenAI such as ChatGPT and Gemini, or supplying students with one already drafted by GenAI. The students' first task, formatively assessed, was to critique the draft, this

could include grading and commenting. Then the students were to use that draft, respond to their own critique, and create a final assignment. This is a mode the lecturers see as a way of positively, productively, and appropriately engaging students with GenAI with full transparency. Methods of ensuring sufficiency of students' own work in the final product include appendices with prompts and responses from interactions with ChatGPT, drafts with track changes, reflective summaries of use of GenAI, and making the word count dramatically different.

Future Predictions Regarding the Influence of GenAI on Teaching, Learning and Research in Institutions of Higher Education.

The results show that there is little consistency among the themes related to the use of GenAI in higher education institutions' teaching, learning, and research. One overarching trend did surface, though: it appears that everyone believes technology will advance. Both the findings of the current study and the empirical literature support issues of inaccuracy with ChatGPT and Gemini outputs. This premise is supported by study findings by Surameery and Shakor (2023) who observed that the accuracy of ChatGPT in reasoning categories was unreliable. They found that the phenomenon is more prevalent in inductive reasoning than it does in deductive and it is prone to illusionary problems. As a cautionary measure, Biswas (2023) suggests that the results of ChatGPT analysis should be interpreted with caution. However, the accuracy of ChatGPT was often observed to be passable or potentially in the range of scoring significantly. The general feeling was that it was not deep enough for high scores or advanced courses. Opinions showed that ChatGPT can't provide it at the level of scientific knowledge that students should be able to demonstrate. Respondents also noted that GenAI could not deliver detail specific to the individual course content.

There was a common thread in the responses in that as generative AI tools continue to develop, they will improve in quality and accuracy of output and thereby have ever increasing influence in the industry. Respondents stated that the key for them is to stay abreast of new developments in GenAI and AI in general, accept the fact that technology is going to continue to advance and be fully involved and entangled with education. This theme was also ubiquitous as espoused by data provided by the

respondents. A third of the respondents stated they are really curious as to how fast GenAI is going to evolve to be that more authoritative instrument. Some respondents indicated that they have previously tested ChatGPT against an assessment at the beginning of semesters one and two, and observed the later outcome was significantly more complex and subtle. These sentiments are supported by the empirical literature. For instance, in a pattern recognition task, ChatGPT made a mistake on a query that it was correct in the previous episode. It also reduced its accuracy in identifying prime visa a viz composite numbers from 85% to 50% accuracy. Southern (2023) argued that ChatGPT users were complaining that the tool had become prone to more mistakes or nonsensical answers at some point in time. The study indicates that the traffic on Open AI's website reduced by approximately 9.91% during the course of the current study. The decline in usage hints that the initial enthusiasm for GenAI might wane as their shortcomings became clearer. Ortiz (2023) describes this particular phenomenon as AI drift. The study suggests the reason for AI drift as an attempt to improve parts of complicated AI models that cause other parts to perform worse.

Discussion

The influence of the recent developments in GenAI have had on teaching, learning and research in institutions of higher education is apparently quite dramatic. First, the integration of generative AI models in education offer a wide range of potential benefits, including improved productivity, enhanced creativity, and personalized learning, providing timely feedback and support, and automating tasks. The findings of the current study suggest the greatest concern is around students using GenAI to produce assessed material and lecturers are facing new challenges including not being able to rely on traditional assessment strategies and tools. A fraction of lecturers is also not in a position to fathom how to create new reliable assessment regimes that are in sync with the current trends in the education sector. However, one of the respondents admitted to have structured his final exam so that the students would generate ChatGPT response with a prompt and correct the text in a way that only a human well-versed in the topic could do. At one of the faculty of business schools from the universities which participated in the current study, some of the lecturers are actually

experimenting with TA Chatpots that will help answer logistical questions about class syllabus. As is often the case with emerging technologies, there are fears about understanding what technology to leverage, how it should best be utilized and what training and support will be required to ensure competent responses to GenAI use. Quick analysis of the responses among the University staff show kneejerk reactions threads to GenAI uptake thus leading to attempts by many learning institutions to ban it, through to well thought out modes of transparently engaging with GenAI. On the flip side, analysis show that the educators can't completely prohibit the use of GenAI tools and neglect to teach it, but they also can't allow their use without constraints. Both the academic and administrative staff seeking to integrate GenAI into their curriculums are left with a big question: How? University-wide policies are slowly taking shape. Most of the universities surveyed are still developing appropriate guidelines with the of addressing the issue in question. Majority of the academic staff feel that transparency and accountability are very important in this regard and are keen to engage with students in such developments. However, although there are a few ideas, the findings show that there is little consensus regarding what that would look like. From the themes identified in findings of the current study, there are clear commonalities as far as usage of GenAI is concern.

The Supremacy of ChatGPT GenAI

In current dispensation and in the 21st century education in all the levels, the employment of GenAI is unavoidable. Although some of the academic staff members admitted leveraging other GenAI tools in the surveys including Bing AI, Dall- E, Grammarly, and Midjourney, the ChatGPT tool dominated the discourse and was the most discussed GenAI application across the board. Only three GenAI tools were mentioned by name by the respondents. Majority of the student respondents intimated that ChatGPT single-handedly improved their grades in various courses and noted that the tool was extremely helpful. ChatGPT can be used as a very productive tool allowing for great Lewandowski, *et al*, (2023) noted that the accuracy of ChatGPT in answering questions in Dentistry tests had a significantly better performance compared with the lower versions of ChatGPT. On their part, Ram and Verma (2023) predicted

that ChatGPT and other large language models (LLMs) will continue to improve in terms of accuracy and responsiveness. In support to the above prediction, Stokel-Walker and Van Noorden (2023) reiterates that this phenomenon will transform very quickly due to the fact that the technology behind generative AI is moving so fast that innovations emerge every month and in compliance to Moore's Law which states that by focusing on strategic alignment and readiness to adapt, Organizations can navigate the fast-changing AI innovation landscape by leveraging the power of AI to achieve meaningful impact without being overwhelmed by the flow of change. Fundamentally, navigating the rapid evolution of AI is a matter of strategic choice, embracing adaptability, and committing to continuous learning. These strategies will not only allow organizations to keep pace with technological advances, but also use AI to enhance their mission and impact in the digital age. Majority of the respondents agreed that the goal should not be thinking about backwards but rather everyone in the industry should be racing against the clock continuously.

Cooper (2023) explored the potential of using ChatGPT to transform science education through investigating three main areas: ability to answer science education questions, ways for educators to use ChatGPT in their science pedagogy, and lastly, how ChatGPT was used as a research tool in this study. The authors found that on a wide range of questions, ChatGPT is capable of returning an adequate and informative answer pertaining to science education. The results often fit major topics of research. Moreover, the study suggests that educators can use ChatGPT to generate personalized learning materials, create interactive learning activities, provide students with feedback and support, and assist with the design of science units, rubrics, and quizzes. However, the authors used ChatGPT to edit and improve the clarity of the research script. They found that ChatGPT was a valuable tool for this purpose, but emphasized the importance of critically evaluating and adapting AI-generated content to the specific context. But they also highlight ethical considerations surrounding the use of GenAI in education, learning, and research, pointing out the risks of assigning tools like ChatGPT ultimate authority and the potential for copyright infringement. The study further argued that it is important for educators to adopt responsible approach for using such GenAI tools as ChatGPT, prioritize critical thinking through focusing

meta-cognitive skills in their provided learning activities, and clearly communicate expectations to their students.

However, there is also discourse derived from the recent research which suggest the opposite. Chen, Zaharia, and Zou (2023) conducted benchmark tests comparing the accuracy of GPT time-saving measures for both the academic staff and students. It was revealed that the academic staff are also using it to improve efficiency in data analysis, especially with Big Data. It is also being used to draft assignments and reports, within ethical constraints. However, there is little discussion around what can then be done with the time saved by leveraging GenAI. The influence of ChatGPT for instance is an industry wide bustle of development in generative AI mantra, and the influence particularly on education has been a variety of knee-jerk reactions to the unknown. A common practical response would seem to be to allow or encourage the use of GenAI by including transparent records in evaluation applications.

However, for the effective implementation of ChatGPT, it's vital to provide appropriate training to teachers. They need to acquire the necessary technological knowledge to use this tool effectively in the educational environment. Teachers should not only learn how to use the technology but also understand its capabilities, limitations, and the associated ethical and pedagogical challenges. The implementation of ChatGPT should be approached thoughtfully to ensure a responsible classroom environment. It should not replace important skills, and precautions need to be taken to avoid academic misuse for dishonest or unethical purposes. It's also worth noting that ChatGPT's knowledge is limited and hasn't been updated beyond 2021. As a result, its responses may not always be accurate or reliable, especially for specialized topics and recent events. This limitation can pose challenges for students who rely on ChatGPT for information in their learning process, and there's a phenomenon known as "hallucinations." Hallucinations refer to responses that sound plausible but are actually incorrect or nonsensical, which can be problematic in an educational context.

The need for institutional support

On behalf of the entire academic fraternity, the respondents feel that there is a tenacious need for adequate training, however, they also typically feel that the Universities are too slow and bogged down with corporate control to be able to respond to the phenomenon adequately. This argument extends to the whole education industry, particularly around concepts of intellectual property. The concept of GenAI as a tool extended beyond simple time saving measures to identifying patterns in data, improving modes of expression, and adding perspectives on a variety of types of content. The current study reveals a general feeling of uncertainty regarding the influence of GenAI on teaching, learning and research in institutions of higher education in the future with mixtures of optimism and pessimism, often concurrently within each academic staff member. Further research, and perhaps professional development is needed in relevant and appropriate modes of engaging with GenAI, for both staff and students. Further dialogue is also needed in ethical considerations, and limitations, of engaging with GenAI.

The significance of engaging with students

A very important concept highlighted by the respondents in the current study is engaging with the students in conversations on the subject of GenAI. The focus needs to be about the students' education, as they are the primary stakeholders of any institution of higher learning. Looking beyond education and forward to the industry level where the students will eventually be working, the University officials should continuously observe how GenAI is being engaged. This initiative will be an important informative process for educators and other related stakeholders. The respondents expressed how GenAI is being used in fields as diverse as journalism, health sciences, computer sciences, business studies, social and political sciences. It is the prime duty of institutions of higher learning to now ensure that the students are prepared for digital age industries which will inevitably be influenced by GenAI in ways yet unpredictable. In addition, the Universities are obligated to best prepare students to critically, and ethically, engage with industry practice. To achieve this, educators must stay current on the theory, contemporary pedagogy, and practical applications of GenAI in both

education and industry. The study has found that GenAI can provide quick and accurate answers to specific questions, offering access to relevant and up-to-date information, which benefits students in their inquiry and understanding of various subjects as well as the ability to enhance student academic performance and stimulate critical thinking. Additionally, GenAI adapts to individual learning paces, enhancing student motivation and engagement while allowing educators to focus on interactive tasks and constructive feedback. However, ethical considerations and challenges, such as student data privacy and the reliability of GenAI responses, must be taken into account. The present status of the current study considers variables like socio-economic, cultural, institutional, and technological environments. What is coming out clearly is that GenAI can help institutions of higher learning to manage and allocate learning resources intelligently, improve the utilization of educational resources, enhance education quality and efficiency, offer better learning services, and prepare students for future societal needs. This overview of emerging research trends highlights the transformative potential of GenAI in education and underscores the importance of conducting further research to fully understand and maximize its influence.

Conclusion

It is envisaged that generative AI models, by personalizing learning, providing feedback and support, and automating tasks, would have the potential to turn a completely new page in education. However, there are also several challenges that must be resolved before they can be widely applied within traditional and virtual classrooms. The utilization of generative AI models in academia has become notably a highly debated topic within the education spectrum. For instance, a GenAI tool like ChatGPT offers numerous benefits that are not limited to enhanced students' learning and engagement, collaboration, learning accessibility among others. However, its implementation also raises concerns regarding academic integrity and plagiarism as cited by several studies that contributed to the success of the current findings. Data analysis revealed there is no homogenous narrative among the academic staff concerning the influence of GenAI on teaching, learning and research in institutions of higher

learning and a great deal of indistinctness regarding the best practices in response to the recent technological developments in question. The greatest concerns among staff revolved around the concepts relating to GenAI's potential influence on academic integrity, however these concerns may be overstated.

In this sense, although artificial intelligence is not something new, the emergence of GenAI has generated debate in the education sector, questioning aspects such as traditional tasks, methodology and evaluation. Further research into the potential and effects of these tools is needed, with a view to didactic and scientific aspects, in order to integrate GenAI ethically and responsibly into educational practice. The main limitation of the current study lies in the limited amount of literature included in the analysis. This is because, so far, not enough studies that address the specific use of GenAI in higher education institutions have been conducted especially in developing countries. Educational technology is a constantly developing and evolving field, and its implementation in higher education may be relatively new and therefore less researched compared to other levels of education. Despite this limitation, the current study provides an overview of how GenAI has influenced the university level. As more research is conducted and knowledge about the use of GenAI in higher education expands, It would be useful to extend the research to better understand its impact and benefits at this particular educational level.

It is now becoming clearer to argue that GenAI has had a dramatic influence on teaching, learning and research in institutions of higher education in recent past. It is imperative that educators, and management, stay abreast of developments and continue to invest heavily on the ongoing research and discourse regarding responses to GenAI, keeping in mind the University's obligation to serve the students in preparing them for the industry. Additionally, the current study highlights that educators can use GenAI tools like ChatGPT to create personalized learning materials, create interactive learning activities, provide feedback and support to students, and help design science sections, rubrics, and tests. The study also observed that the authors at some point leverage ChatGPT to assist with editing and improving the clarity of their research narrative. The study has underscored that ChatGPT is a

valuable tool for this purpose, but stress the importance of critically evaluating and adapting GenAI-created content to the specific context. However, the respondents also highlighted the ethical considerations associated with the use of GenAI in education, such as the risk of such tools as ChatGPT, Gemini and others positioning themselves as the ultimate authority and the potential for copyright infringement. The respondents continued to argue that it is important for lecturers to embrace responsible behavioral approach for using GenAI tools, prioritize critical thinking through focusing metacognitive skills in their provided learning activities, and clearly communicate expectations to their respective students.

Recommendations

It emphasizes the establishment of policies, guidelines, and safeguards to protect data privacy, ensure ethical AI practices, and promote responsible use of AI technologies. The Operational dimension of the framework addresses practical concerns, like infrastructure and training. It emphasizes that a proper technological infrastructure, with sufficient technological support for GenAI, has to be in place if GenAI is to work successfully in the higher education realm. Additionally, it emphasizes the need for training programs to equip the academic staff with the competences required to effectively use AI technologies. This study underscores the potential applications of generative AI models, specifically Gemini and ChatGPT, in areas such as personalized learning, language instruction, and feedback provision.

The findings showed that lecturers and GenAI can work together effectively to revitalize learning, teaching and research. Lecturers need to use their teaching expertise to incorporate GenAI tools into their instructions. The current study provided valuable insights into how large language model GenAI could be employed in education in the future and why it is important for lecturers and GenAI to work together. The study stresses on the necessity of enhancing GenAI such as the popular ChatGPT's capacity to distinguish between queries it can properly answer and those that should be handled by human experts. They also outlined the gains realized from the use of generative AI models in education. Principal among them was better

learning outcomes, improved productivity, and increased engagement of students through tailored education, feedback, and support.

Concerning the perceived risks, the study recommends shared responsibility and collaboration among developers, subject matter experts, and human factors researchers to consider effective counter measures to misuse of generative AI models such as ChatGPT. The current study is alive to the fact that the ethical and practical challenges that arise when implementing GenAI in education are real. Key concerns include potential bias in the relevant algorithms and the need for adequate lecturer/student preparation and support. Based on their experiences, this study has found that GenAI such as ChatGPT can be used effectively to teach and learn active and case-based learning activities for both students and instructors in social psychiatry. However, it acknowledges the limitations of some of the GenAI tools, such as the potential for misinformation and biases. The study observes that these limitations may be temporary as technology continues to advance. It argues that with appropriate caution, generative AI models can support social psychiatry learning, teaching, and they encourage further research in this area to better understand their potential and limitations. The findings demonstrated the potential applicability of GenAI in writing pedagogy, highlighting its affordances as a tool for composing writing efficiently. However, participants also expressed concerns about the tool's implications for academic honesty and educational equity. Specifically, there were concerns about plagiarism, or a need to redefine what is considered plagiarism with generative AI technology. In light of this therefore, the study recommends the development of regulatory policies and pedagogical guidance to ensure the proper utilization of GenAI in educational settings.

Regarding the perceptions of the users, the public discourse on social media reflects increased interest for GenAI particularly using ChatGPT in teaching several subjects including mathematical concepts. However, there are also cautious voices about its educational use. The findings of this study recommends further research to ensure the safe and responsible use of GenAI, particularly ChatGPT, into mathematics education and learning. The research also highlights the need for continued exploration and understanding of how GenAI tools can be effectively integrated into educational

settings. Overall, this study illuminates the use of ChatGPT in education by providing information on public discourse, various aspects of implementation, and user experience. The findings emphasize the importance of considering ethical implications and ensuring responsible adoption of GenAI in learning, teaching, and research. The study recommends that the Universities should consider the capabilities and limitations of the technology, as well as how humans perceive and interact with these GenAI systems to inform the policy direction.

Implications for theory and practice

The findings have important implications for the models developers, teaching fraternity, and universities as they work to accelerate the adoption of them in educational contexts. The study is rallying the stakeholders to consider fostering institutions of higher learning to have a safe and responsible adoption of such technologies in education. Hypothetically the study has shown a strong nexus of its findings and the ideas such as connectivism. GenAI is likely to see a resurgence in interest in this philosophy and as consequence, strong frameworks relating connectivism to student interaction with GenAI for invoking yet another aspect of technology to consider. Practically, there are grey areas that will warrant closer attention. Notably there are significant training issues for both staff and students in the use of GenAI coupled with the confusion in what tools are appropriate to be used. Insufficient or lack of training can lead to communication issues and misunderstanding about what is and isn't acceptable in individual assessment tasks hence spiraling to significant implications around academic integrity. The current study notes this as a key area to explore in future research.

The study was conducted at selected Universities drawing 300 respondents. As the sole researcher in this particular study, it's prudent to state that the results of this study are reflective of the national mood in the region as indicated by a series of workshops and presentations at conferences and a national statement on the use of GenAI in education. The current study offers a detailed snapshot of one specific case study where most users were mainly aware of several GenAI tools. Whilst GenAI tools such

as ChatGPT have strong current hold today, funding models, privacy concerns and copyright issues will provide important issues for Universities and governments within the region to contend with hence hampering its adoption. The timelines for responding to these issues are quite brief, because students will not wait for policy revisions while they interact with generative AI tools. Policy designs will need to be flexible and adaptable to accommodate rapid developments in AI technologies which may be problematic in large, slow-moving institutions.

The findings from this study may be regional-specific and therefore may not be indicative of the general global perspective. It does, however, provide a context for future research and provides a detailed and specific example relevant to the overall discourse on the influence of generative AI on learning, teaching and research in institutions of higher education. The findings emphasize the need for Universities to adapt their practices to ensure academic integrity and monitor the quality of student learning. The study's results have important implications for University managers, regulators such as Commission for University (Kenya), Tanzania Commission for Universities (TCU), National Council for Higher Education (Uganda) among others, Universities' Senates, academic staff and students, as they navigate the integration of GenAI tools in the educational landscape that is dynamically changing very fast. With the wide usage of GenAI tools from students' perspective, it has become crucial for academic programmes designers to understand the implications of using GenAI-based tools on the results of evaluating students' achievement of the learning outcomes. Findings of this study underscore the need for further research, regulatory policies, and pedagogical guidance that is compliant to Competency-Based Education (CBE) that is being currently implemented in Kenya, to navigate issues related to academic integrity and equity in the era of GenAI enhanced learning. The irresponsible implementation of generative AI models in education have ethical and legal consequences that must be considered and mitigating measures be put in place to address them before they compound to major problems.

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About the Author

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