Chapter 9: With or Without Artificial Intelligence: The Transformational Challenges of Postgraduate Supervision in South African Higher Education

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Abstract

The quality of postgraduate education primarily depends on effective supervision of postgraduate students. In today's technological driven landscape, the supervisory role has become more challenging due to different technological elements, such as Chip Chat, Artificial Intelligence, Machine Learning (ML and other technological tools etc.). This is in addition to the economic, social, and educational backgrounds of postgraduate students where their attraction and retention are significantly important for educational institutions. This work proposes that though AI is significantly important for academic research the potential to erode the basis for thorough and careful research process current and future developments in artificial intelligence (AI) systems vis-à-vis the space for human intervention have the capability to transform or revolutionize the research process either for better or worse. Thus, AI systems can productively serve as agents of transformation since they help to streamline and conduct our research. However, these technological elements can also become a potential enemy if allowed to replace the position of the supervisor and the student thus weaken academics ability to learn as theorists, or take academics off course through bias, inaccurate, and sometimes fake information regarding a research phenomenon, while putting students' postgraduate learning experience and supervision and other interest at risk. Whichever angle is considered, AI systems have come to stay. Using qualitative method, this work argues that AI has the potential to undermine the very essence of academic inquiry owing to its potential to disrupt the established research methodologies, ethical

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paradigms and fundamental principles that have long guided scholarly work, though seen as indispensable for academic research. Concluding that while the use of AI tools can be entertained in research activity, it has the potential to undermine the credibility of the researcher and the supervisor since the product of such research would no longer be the research team's (the student and the supervisor) ideas but that of the AI, hence the need for caution while using AI.

Keywords: Technology, Artificial Intelligence, Research, Education, Ethical paradigms

Introduction and Background

According to Pal (2023) AI has markedly reshaped the landscape of academic research, with the capability to act as a catalyst for both methodological innovation and expansive shifts in scholarly paradigms. Evidently, the transformative power of AI cut across several disciplines, making it possible for researchers to meaningfully engage with complex research data and questions faster, arguably, liberating researchers from time-consuming and often boring and monotonous research tasks. Burger *et al.* 2023; Neyedli *et al.* 2011, further reiterate that the multifariousness of AI goes beyond expediency; but also serves as a means to enhance the reliability and the ability to reproduce and replicate research in addition to reducing human error in data collection and its analysis. Thus, justifying that AI's have the capability(ies) to delve into rigorous academic tasks that requires more intellectual expertise.

There are several studies that have been conducted on students' supervision of which much have concentrated on unfolding the ever-lengthening lists of the functions that a potential supervisor must carry out. Recently, academics have been noted to be writing on the functionality of the AI vis-à-vis the supervision of post-graduate students. However, most authors tend to neglect the transformational challenges of postgraduate supervision in the era of AI, which academics seem to have identified as means to an end in the ever-increasing lists of tasks for the supervisors. Generally, and in many African institutions, all-encompassing academic scholarship is assessed based on the quality of publications from academics, the regularity of publishing, records of postgraduate supervisions, grants and awards, as well as service to the academic community (Rumney 2016; Lemmer 2016). Daramola (2021) believes that postgraduate supervision plays a major role in attaining the professorial cadre,

and that students are primarily the main actors that punch up the delivery and the attainment of these academic achievements. A very good analogy of this is the typical automation procedure of Input-Process-Output (IPO).

By interpretation, the supervisor from experience, gives input by sharing his/her ideas and experiences with the supervisee, who in turn processes the input powered by his/her motivation, and intellectual ideas to generate outputs in the form of a completed thesis and sometimes journal articles from the thesis. Debatably, the quality of the input from the supervisor and the quality of the processing by the supervisee primarily determine the quality of the final outputs. In the new era of digital media and AI, which may optimally guide and support postgraduate students for greater productivity along their research journeys, acting as a research supervisor in Higher Education is challenging and complex.

The propensity that academics may avoid it in its entirety due to the fear of its nature and their field of specialization is somewhat high. Kenny and Fluck (2022) and UNESCO (2020) reiterate that the changes that have taken place in higher education in recent decades with massification strategies have had significant effect on higher education resulting in the increased number of enrollments in universities, translating to a significant upsurge in academic staff workload. Unarguably, this would have some sort of negative impact on effective research supervision. In a simple analogy, given that the University of Zululand, South Africa first awarded PhDs in 1984, with more than 500 awarded in the following three or four decades in addition to several numbers of Master's degrees. What this means is that research supervision has become more challenging as a result of the difficulties in the provision of personalized, individualized and differentiated attention to postgraduate students (Denis *et al.* 2019; Igumbor *et al.* 2022).

However, as much as one would see AI as an essential tool for academic research cum postgraduate supervision, one pertinent question that needed to be answered centered on AI's undermining the very essence of academic research and inquiry. As it sounds, it is not a matter of strengthening research with advanced tools. As supported by Butson and Spronken-Smith (2024:563) that, AI is capable of disrupting the established methodologies, ethical paradigms and fundamental principles that have long guided scholarly work. In other words, research activities, such as writing, data analytics [which converts raw data into actionable insights] and content analysis in literature reviews may be subjected to this disruption. This is not to say that supervisors are not facing challenges such as high abrasion rates, limited supervisory capacity, the under-

preparedness of students in postgraduate education, which has drawn the attention of scholars to the use of innovative solutions. However, the goal of this work is to involve readers as well as scholars in this debate; it is not intended to win the debate over the use of technology, particularly artificial intelligence (AI), in research; rather, it is intended to deepen our understanding while fostering a robust, knowledgeable and proactive discussion about the direction of academia in an increasingly AI-dominated era.

Aim and Method

The aim of this chapter is to examine whether the use of AI tools in research vis-à-vis the dynamic supervisory role of educators in tertiary education has the potential to undermine the very essence of academic inquiry owing to its potential to disrupt the established research methodologies, ethical paradigms and fundamental principles that have long guided scholarly work. To gather deep insights into the topic under consideration, an extensive review of the relevant literature was conducted through searches in journals, newspapers, periodicals and Higher Education websites. Thus, this paper presents a qualitative study about the impact of AI vis-à-vis transformational challenges in postgraduate research supervision.

Theoretical Support

From the literature the following classical theories in reference to the use of AI tools in research were identified, including the Kantian-inspired model, utilitarianism and precautionary principle. According to Jacobson *et al.* (2020) the Kantian model places a demand on researchers, the supervisee and the supervisor who must not play away their responsibilities. The authors further explained that the same process must be invoked in order to ensure responsible AI tools. By extension, the developers of AI tools must ensure that AI will not cause disruption or pose a danger to society in addition to making sure that its inadequacy is addressed. In this vein, researchers must use AI tools responsibly during their projects. For the utilitarianism approach, Jacobson *et al.* (2020) place emphasis on the consequences and the best possible outcome for most researchers. Again, the utilitarianism approach sees in AI tools the problem of using machine learning algorithms to help progress science and maintain participants' privacy, instead of preserving the wellbeing of research participants and other individuals. While writing on AI tools, Chassang *et al.* (2021)

reiterate that the precautionary principle in AI may serve as a framework to boost research and development with responsible AI tools, but the protection of individuals, society and the environment from potential negative impacts that may arise from AI systems must be prioritized. What this translates to is that the societal needs should be considered in addition to making sure that potential risks are identified and taking care of, from the conception of the AI tools.

Understanding Research Supervision in Higher Education

In Higher Education (HE), quality and high level of research supervision is expected. This is underpinned by a strong quality assurance, especially at doctoral level. Wright (2024:482) concurred that at doctoral level, the underlying element is the advancement of knowledge, original research and critical thinking. On the part of the academic supervisors, academic freedom and innovative thinking takes the center stage. Zhao (2001) sees research supervision as the highest level of delivery. At this level, it requires intricacies of skills, expertise in the field, understanding stakeholder management, traversing funding bodies and the ability to manage sensitive relationships between the supervisor and the supervisee.

In practice, research supervision is sometimes presented with complex dynamics in relationship between the supervisor and the student. For example, academic supervision is like a marriage where the supervisor and the supervisee start out with the best intentions, hopes and aspirations of happy ending with research outputs and publications. However, unforeseen circumstances such as sickness, lack of commitment, inability to get funding among other issues may lead to withdrawal from the study and differing outcomes can change the dynamics of this marriage. Like all marriages, the relationship between the supervisor and his/her student is a shared process and in many cases counselling and advice are critical elements required by both parties. Thus, research supervision is laden with intensive and varying degrees of processes. Again, supervisors and students are frequently engaged in communication to facilitate the supervisory process. Halse and Malfroy (2010) however, expresses the opinion that often, research supervision is full of stress since it demands a significant amount of time and attention if the supervisee must be effectively guided through their academic journey.

Overtly or covertly, academic supervisors are commonly fraught with numerous responsibilities, this include teaching, administrative duties, personal research, conferences, thus leading to possibility of being overloaded with

schedules that could somewhat compromise their supervision and its quality. Undoubtedly, this could force supervisors to focus more on the functional and technical aspects of supervision while neglecting the students' social and emotional needs. Hence, researchers have had to explore various means and technological solutions. But the question is, how rigorous would such research be in terms of managing the dynamics of research, its quality, ethical questions as well as differentiation in technology generated learning and human intellectual analysis?

According to Lee (2008:267), supervisors' approach to supervision is influenced by two main factors: first, their own experiences as doctoral students, and second, their conception of research supervision. Lee further highlights five aspects of research supervision including functionality, enculturation, emancipation, critical thinking, and relationship development.

1) Functionality: The aspect of functionality focuses on the expert management of research projects and their advancements, which is frequently accomplished through scheduled meetings, goals, and recurring outputs like presentations at conferences and publications.

2) Enculturation: This is the process by which students acquire the skills necessary to become members of the disciplinary community and develop a sense of belonging. This process frequently involves learning the investigative, communicative, and writing techniques that are common to a particular academic community.

3) Emancipation: This is the process of helping students find personally meaningful frameworks, reframe their identities, and transform themselves in order to empower them to become self-sufficient.

4) Critical thinking: The goal of critical thinking is to help students become more rigorous thinkers, identify and evaluate the weaknesses in arguments, analyze and question their own work, and think in novel ways.

5) Relationship development: This emphasizes the social and emotional ties that exist between supervisees and supervisors and is concerned with loving and caring.

Understanding the Functionality of AI and Postgraduate Supervision

The upsurge in the number of postgraduate students has somewhat increased the burden of having to face a considerably higher student-supervisor ratio. This challenge has led to looking for innovative solutions that can serve as leeway to bridge the challenges of supervision while effectively supporting the supervisee. Hence, one possible avenue that could be harnessed lies in the capabilities of technologies like AI. Barnes *et al.* (2024:1) point out that artificial intelligence is the science and engineering of creating intelligent computers, with a focus on machines' ability to learn, at least in part, like humans. According to Puntoni *et al.* 2021) AI is an ecosystem or technological tool that includes three fundamental components: data collection and storage, statistical and computational techniques, and output systems. These component enables AI products and services to perform tasks that are commonly understood to require high intellectual capability and autonomous decision making on the part of humans. In the current era, AI has become a general-purpose technology with the capability to transform users' lives in different ways. Hence, Li *et al.* 2023) observe that the use of AI for research by students is becoming a major concern for universities. Unarguably, most of these tools can be used to generate content, simply because of its user friendly.

According to Cochrane (2021), we can confidently conclude that there has never been so much technological change in such a short period of time, and that society has never faced such challenges from the empowerment of the individual brought about by personal upward mobility in computing. Technology has had a significant impact on the fields of employment, play, retail, entertainment, and services. ChatGPT has been upending our world [of academics and research] with its astonishing performance thus aiding its quick spread and acceptance. ChatGPT (Chat Generative Pre-Trained Transformer) according to Peres, Schreier, Schweidel & Sorescu (2023) is a free chatbot developed by OpenAI, that generates text in response to a human-provided prompt. ChatGPT is based on large language models (LLMs) that autonomously learn from data. Therefore, can ChatGPT be a co-author in a research work knowing fully well that it is capable of writing or generating information in any research domain? How should academics go about AI generated literature reviews?

Spronken-Smith (2024), Müller *et al.* (2022), and Tauchert *et al.* (2020) agree that AI's functionalities serve as leeway for the supervisor, supervisee and researchers alike, to focus on the sections that talk to conceptual framework and

the theoretical aspects of their research work, therefore consenting to a deeper level of concentration on the research questions. Further to this, they allude to the ability of AI process natural language which has proven to be invaluable in the area of literature review. Unarguably, AI can effectively summarize a large quantity of literature, and present researchers with strong and coherent summaries in addition to highlighting some research areas for further investigation.

Thus, advocates of AI have complimented its capability to effectively act as a research tool while it also presents a plethora of chances to improve researchers' experiences through interactive and responsive supports. Corroborating this, Butson and Spronken-Smith (2024) comments that the ability of AI to support multidisciplinary research is unequivocally the most striking example of its innovative and transformative force. Because AI can swiftly and effectively analyze datasets from a variety of academic disciplines, it opens the door to innovative multidisciplinary initiatives and collaborations by enabling researchers to draw correlations they might not have otherwise thought of. Thus, expanding the scope of individual research efforts while serving as means of enriching academic discourse. According to Müller *et al.* (2022) Artificial Intelligence plays a transformational role not just in operations but also in the epistemological underpinnings of research. It broadens the scope of what may be known and studied by facilitating larger-scale, more intricate investigations that provide a more nuanced knowledge of occurrences. Thus, rather than only being a tool for automating monotonous work, AI enhances human talents and acts as a transformative force. It actively participates in the research process, influencing not just the methodology but also the questions and answers that might be investigated (Butson & Spronken-Smith 2024). It thus indicates a methodological turning point of significance that the enabling function of AI in academic research cannot be whisked away as mere technological cosmetic application.

Furthermore, AI's incursion into the research world is not immune to the writing process given its transformative character. Artificial intelligence (AI)-driven writing tools have the ability to change the researcher's perspective on their own work beyond simple style recommendations or grammar checks. These resources can question the text's epistemic integrity by encouraging writers to create better logical reasoning frameworks and even pointing out logical errors (Pividori & Greene 2023; Abd-Elsalam & Abdel-Momen 2023). But when combined with the kind of best practice, AI tools can be creditably used as an innovative tool. Van Dis *et al.* (2023) draw our attention to the dangers of utilizing AI while describing the important discoveries of the areas

of study. Therefore, additional study is required to establish best practices for employing AIs in support of human researchers, as well as to better understand the validity and reliability of doing so. By implication, AI has the potential to alter our perceptions of data, research challenges and even what constitutes knowledge. It does this by speeding up the process of conducting research. Unarguably, this is a force that has the power to completely alter the core traditions of academic rigor, rather than just a small shift.

Borrowing from the Greek mythology of Pandora's box, arguably, AI is mostly capable of speeding up the process of research; thus, given the supervisee and the supervisor some sort of academic relief in their research journey, in addition to changing perspectives about research problems and generation of data. Christou (2023); Ryan *et al.* (2021), believe that this is not a minor change in the process of research because AI is practically redefining the essence of conventional research. Hence the question of how researchers would tackle the challenges relating to ethical, inform consents, methodologies and other research involvement in the wake of AI tools.

Transformational Challenges of Research Supervision with AI

The use of AI by the supervisee and the supervisor [without any policy of intervention] is here to stay. That employees and supervisors want students to graduate at the record time has made policy makers to jettison the effects of AI. Unarguably, this is because of the user friendly of AI tools, hence the challenges of how supervisors, the supervisee, and researchers alike should respond to the emergence of AI tools.

Traditionally, the issue of informed consent in research is a non-negotiable ethical position that cannot and must not be whisked away. Conversely, this honest contractual agreement between the supervisee, the supervisor, the research respondent, and the institution represented by the supervisee has been compromised owing to the sophisticated nature of AI tools. For example, algorithms [a set of mathematical instructions that is designed to accomplish a task] have the ability to reuse data for several analyses. This to a large extent, may not have been put into consideration in the informed consent. Liaw *et al.* (2020); Tozzi and Cinelli (2021) believe that these types of ethical complexities require researchers as well as higher educational institutions to reconsider approaches to participant ethics, most importantly when their data are capable of being used in several and other research. This is in addition to the problem of data privacy, security and confidentiality. Certainly, the

ravenous craving for data by the AI tools is a well-known phenomenon by scholars. Butson and Spronken-Smith (2024:565-566) concurred that the process of data collection, its handling, and storage are often glossed over by researchers, thus presenting researchers with a quandary of tension between leveraging the capability of AI tools and safeguarding data privacy.

For scholars and higher educational institutions, AI tool might be a promising leeway to speeding up research and efficiency-boosting and reporting measure, but the existentiality of the AI tools has played down the possibility of plagiarism and its grave consequences. Wright (2024) defines plagiarism as the act of taking another person's work or idea and claim it as one's own. Overtly, this includes unpublished and published materials. It is therefore pertinent to the question where this sits reference to higher education regulations on plagiarism when using AI tools or discussing the phenomenon with our colleagues to be [the supervisees] and supervisors. Wright (2024) express that AI tools should be explicitly seen as occurrences of plagiarism in research. As stated, above AI is here to stay, definitely supervisors will always encourage their supervisees to use AI tools. Debatably, the use of AI tools may have a negative implication for the integrity of academics and while questioning the place of the reliability of plagiarism-check software used by higher education institutions. This suggests that embracing integrity should not be thrown into the wind rather supervisors must put this into consideration.

Unarguably, emergence cum transformative power of AI tools naturally comes with the question surrounding the issue of intellectual property, its consequences for copyright and patent laws. This cut across the entire globe and the most affected is the academic world that is supposed to be the custodian of the positivity that may likely emerge from the use of AI tools. Therefore, how can the concerned intellectual property be protected? In fact, who should be protected in the first instance, and how far should the protection go? In his answer to this question, Brittain (2023) believes that using AI tools to generate an image to be used in a journal, thesis, or a book [for example], cannot be equated to a human authorship and thus such work cannot be copyrighted.

Vincent (2022) asks, how much credit a human may receive for using AI tools in research work? What are the psychological mechanisms and contingencies? Should the level of human involvement affect the ability to copyright the output produced by the AI tools? What is the difference between using conventional tools and ghostwriters, or a supervisee who follow and execute the directions of the supervisor in his/ her presentation? These are the questions that must be taken into consideration by the supervisor and the supervisee while

considering the use of AI in research. Evidently, both the supervisor and the supervisee are a vantage position in that both have the opportunity to deve-lop their research skills and critical thinking, data analysis skills in addition to facilitating professional networking with other researchers and funding opportunities.

While the levels of rights differ [in terms of human and animal protection], the concept of fundamental human and animal rights remains a significant value to human beings and animals alike. While focus on research guidelines, patterns, and norms are being propelled to fit the standards of AI tools, there are questions on moral status and rights that have been raised to fit into this new experience. Scholars have argued that it is not possible to assign moral agencies to AI tools. Stahl and Coeckelbergh (2016), Farisco *et al.* (2020) argued that AI tools and robots do not seem capable of solving problems ethically and lack explanation with regards to its generated results, in addition to the absence of willingness to choose which invariably might have grave impact on decision making in research ethics.

Unequivocally, rights are attributed to all living entities, man, or animal. In South Africa [and by extension every country that is conscious of the rights of others including animals] the law protects animals as sentient living organisms and unique tangible goods. The South African Medical Research Council for example, recognizes that all vertebrate animals are protected by law in South Africa (Animal Protection Act No 71 of 1962. Therefore, it is an offence in terms of this act to kill or interfere with the well-being of an animal for scientific or educational purposes without justification which is ratified by a formal process of ethical review (Pick 2004. The legal status of these animals obliges researchers not to harm them during research projects, thus questioning the status and rights that should be assigned AI tools in research of this nature. Debatably, researchers' relationship with the use of AI tools in research has, for the most part, developed into a dynamic, intense, and mutually beneficial partnership. It is a nuanced romance with technology that defies conventions of traditional human/computer interaction. Thus, AI tools can be thought of as an interactive sounding board for researchers, postgraduate students, and their supervisors, helping with idea development, organization, and refinement. However, this question must be answered. Is the researcher's writing generated by AI tools or the work of the researcher? Undoubtedly, a fundamental component of academic identity is academic writing.

According to Hyland (2002), academic writing is an act of identity, just like all other forms of communication. It not only communicates disciplinary

information but also presents the academic character of the author. Depending on how it is read, our writing as academics presents us as scholars. Further to this, is AI smarter than us as academic? Certainly, AI does not aim to be smarter than academic/humans. Rather, it makes use of Natural Language Processing (NLP) and machine learning to augment and improve our capabilities, enabling quicker and more effective information retrieval. Nevertheless, when it comes to making important decisions, it fails. Thus, the power of AI only lies in its ability to quickly find, compile, and summarize large amounts of data. Conversely, judgment, insight, and critical thinking are human qualities that are essential to academics, and these cannot be replaced.

In general, the University, Research Ethics Committee (REC), or Research Ethics Boards as they are known in other institutions, are primarily concerned with safeguarding human and, indirectly, animal research participants. They also make sure that supervisees and supervisors adhere to the funding requirements of various funding agencies. In essence, RECs make sure that studies involving human subjects are carried out in accordance with national and international ethical standards, laws, and guidelines. Reviewing and supervising research to ensure that research participants receive the required protection is the main objective of Research Ethics Committees (RECs), which are composed of expert groups that evaluate research proposals with an eye toward ethical issues. Apart from being proactive, anticipating potential hazards in research and resolving ethical dilemmas. Overtly or covertly, the role of university research and ethics committees are very essential to quality research outputs, but this cannot be replaced by the use of AI. Given the unique circumstances surrounding AI research, there is need for RECs to seek to reduce the dangers of potential harm brought on by technology. Samuel and Derrick (2020) are of the opinion that this could be accomplished by looking into scientific inquiries about the source and caliber of data, algorithms, and artificial intelligence; verifying the validation procedures carried out to make sure the prediction models function; and, if necessary, asking for additional validation to be performed.

Applying generative AI, chatbots, analytics, and personalized learning experiences can improve learning efficiency, provide customized educational support, and automate administrative tasks. However, for AI implementation in education, ethical principles should guide it, together with careful consideration of the potential risks and limitations. Educators, parents, and policymakers must actively engage in dialogue and decision-making processes to ensure AI's responsible and equitable use in education. Future research should address the

ethical concerns, cultural considerations, and privacy issues associated with AI in education.

Furthermore, the reliance on AI tools in research raises questions about equity and access, as not all supervisee and supervisors may have equal access to AI-powered resources and tools. By implication, the era of AI presents both opportunities and challenges for research. With this, developing countries, particularly those in the global South may be forced to depend on AI generated data from developed countries which may not be beneficial to such institutions but rather open such institutions and researchers to being exploited.

Despite the assistance provided by AI tools, supervisors and supervisees should be cautious in adopting it. The main issue with this, though, is how dependent students are on these devices. The introduction of AI tools in research can offer a simple substitute, which could discourage students from devoting significant amounts of time to rigorous, in-depth thought and intellectual work (Dai *et al.* 2023). Essentially, when students use ChatGPT extensively to process texts and write assignments, they may lose the opportunity to process texts directly, which could impede their ability to further develop their written communication and deep comprehension skills. As a result, the use of AI in research could encourage a mechanistic approach, which could be detrimental to students' academic and intellectual growth. Therefore, it is critical to find a balance between leveraging AI to increase productivity and maintaining the essential human endeavors of research, such as creative ideation, thorough investigation and dissemination of novel knowledge.

According to Dai *et al.* (2023), ethical issues pertaining to the application of AI in academic settings are vital but still poorly understood. The introduction of new tools like ChatGPT makes it more difficult to define the parameters of academic integrity and deal with possible cases of academic dishonesty. Concerns about authorship, plagiarism and inappropriate dependency are raised by the use of AI. Furthermore, there are important ethical conundrums that require in-depth consideration and resolution due to the inherent bias in AI algorithms, fairness concerns, and the possibility of abuse. Strong ethical standards and protections must be established as graduate students continue to incorporate AI into their research and teaching methods to guarantee the ethical and just application of these potent instruments.

Conclusion

As was already mentioned, AI is undoubtedly here and changing a lot of aspects

of academic life. The question is not about whether to integrate AI and its tools, but how to do so in a way that is consistent with academics' primary research oversight is the urgent question. AI raises ontological, ethical, and epistemological issues. Therefore, even though AI technologies have the potential to completely transform research, their application must be balanced with a knowledge of their limitations with careful consideration of the ethical ramifications. Therefore, it is essential that future research address these issues and devise plans for successfully integrating these technologies into the research landscape while enhancing academics' credibility.

Importantly, academic supervisors are in a unique position to direct practice and should not back down from challenges. Supervisors play important roles as mentors and guarantee that students have a solid foundation in behavior. Academic supervisors also need to stay up to date by engaging in professional development. Academic supervisors also need to stay up to date by engaging in professional development. This is because AI applications are currently affecting teaching and learning, in addition to changing academic research, thus potentially influencing academic careers and raising important ethical concerns. However, this could trigger interdisciplinary research between technically sound scholars and those who are ethically informed. From observation through the products of some supervisors, most tertiary institutions lack mandatory modules or training, and many supervisors lack access to specialized supervision training All postsecondary educational establishments ought to make an effort to assign, assist, and train supervisors. For the appropriate application of generative AI tools according to Dai *et al.* 2023), academic institutions ought to make an effort to develop AI literacy protocols and curricula for faculty and students. According to Awdry (2023), generative AI tools have a place in research as long as students are encouraged to work honorably, which discourages them from lying. Therefore, the expected shift would not happen until newly developed best practices are integrated into all fields of research.

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