Exploring Postgraduate Students' Use and Perceptions of Generative AI as a Research Support Tool: A South African Case

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Abstract. The emergence of generative artificial intelligence (GenAI) and its applicability within higher education institutions (HEIs) has gained momentum worldwide. GenAI tools have caused a paradigm shift in education including students' research activities. Despite various studies being conducted on GenAI tools in education, most research remains concentrated on developed countries, with limited attention to how these technologies are perceived in developing nations. Therefore, this study explores the usage and perceptions of GenAI tools among postgraduate students enrolled for postgraduate diplomas, honours and master's degrees at a private HEI in South Africa. Using a mixed-methods approach, the study surveyed 75 students to understand their usage and perceptions of GenAI tools for supporting research activities. The findings reveal that almost three-quarters of the students use GenAI tools, particularly ChatGPT, and have a positive attitude towards the use of GenAI tools to support their research activities. The high usage of GenAI tools is attributed to their capability to generate research ideas, summarise articles, and simplify difficult concepts. Over a quarter of the surveyed students do not use GenAI tools due to concerns about plagiarism, bias, privacy and the potential to impair cognitive development. 78% of the students are familiar with the institution's policy on GenAI. Most students use GenAI tools to generate research topics and ideas. HEIs should assert balance in integrating GenAI tools to support students' research activities. HEIs should further invest in universal frameworks that will serve as guidelines for using GenAI tools in scholarly activities without violating academic and ethical integrity.

Keywords: Generative Artificial Intelligence, Higher Education Institutions, Research Support, Postgraduate Students.

1 Introduction

The emergence of generative artificial intelligence (GenAI) and its applicability within higher education institutions (HEIs) has gained momentum worldwide [15]. GenAI has triggered a significant shift in the education sector and impacting various areas such as teaching and learning, assessment, and research [27]. In teaching and learning, GenAI tools support content creation, personalised learning, and real-time feedback, thereby enhancing student engagement and promoting active learning [7]. In assessment, GenAI is reshaping traditional methods of assessing students' work by offering automated grading, formative feedback, and adaptive assessments [25].

In research, GenAI tools assist in formulating research topics, evaluating the content, and generating information[33]. Despite their potential benefits, there is still ambiguity about their implications for supporting postgraduate students' research activities. Questions persist around the reliability and ethical considerations of GenAI use for research support.

As a norm, HEIs put measures in place to ensure that students receive efficient research support to be successful in their academic journey. This support, particularly for postgraduate students, is meant to develop prerequisite research skills to generate knowledge [16]. This is through HEIs ensuring adequate student supervisors, library resources, and wellness programmes [12]. Further to this, HEIs invest in peer mentoring, writing centre support, and other skills development programmes aimed at enhancing students' research capabilities [12].

Despite various artificial intelligence (AI) systems being utilised in HEIs for decades, the launch of OpenAI's *ChatGPT* in 2022 has sparked debate on their acceptability within academia [7, 33]. While primitive AI systems were primarily used to classify data and find order in existing information, recent GenAI tools extend beyond that [17].

Its early adopters viewed GenAI models as the most multidisciplinary disruptive technology [28], because of their capability to generate text and solutions better than traditional chatbots [4]. While these tools are perceived to transform students' research support, the academic community is still grappling with questions about their ethical use, reliability, and appropriate integration into students' research activities [7, 11]. GenAI models such as ChatGPT variants continue to receive criticism over ethical concerns [28].

Research on the impact of GenAI on education has been concentrated on Global North countries, with limited coverage from its Global South counterparts. Therefore, this study addresses this gap by assessing GenAI usage patterns and perceptions among postgraduate students from the Global South by exploring a case of a South African private higher education institution (PHEI). The study is guided by the following questions:

1. What GenAI tools do postgraduate students use to support their research, and what are their usage patterns?
2. In what ways do postgraduate students use GenAI tools for research support?
3. How confident are postgraduate students in evaluating the quality and reliability of content generated by GenAI tools?

4. What concerns and barriers influence postgraduate students' perceptions of using GenAI tools for research support?

The rest of the paper is structured as follows. Section 2 provides a detailed literature review, followed by the research methodology applied for the study in Section 3. Section 4 presents the results of the studies, with the implications of these results discussed in Section 5 and the conclusion in Section 6.

2 Literature Review

2.1 The Usage of GenAI Tools for Research Support

Since ChatGPT's release in November 2022, the hype about GenAI tools has been on the rise [11, 26]. With this hype, various studies found that students, both undergraduate and postgraduate, are familiar with the GenAI tools [2, 15]. Despite the wide familiarity of GenAI tools, students are reportedly not fully using them [6]. Inadequate usage of GenAI tools is associated with a lack of policies across HEIs [21]. Contestation among students and academics in adopting GenAI within HEIs due to the lack of policies in place has been observed [29]. However, it was found that the majority of students are using GenAI tools [3]. While GenAI tools differ, various scholars found that ChatGPT is the most preferred and known model among students [1, 11, 15]. To concur, it was found that the majority of students prefer to use ChatGPT across various disciplines and levels of study [32].

Contrary to this, it was reported that students studying in the fields of Science, Technology, Engineering, and Mathematics (STEM) have positive perceptions and are willing to use GenAI tools compared to non-STEM students [35]. While ChatGPT is the most used GenAI model, it is followed by Gemini, Socratic and CoPilot models [1]. Other notable models preferred by students include Gemini, formerly known as Bard and POE, which integrates various types of GenAI tools [13, 34]. Other scholars point to Grammarly and QuillBot as preferred GenAI models to paraphrase and edit grammar [33, 34].

2.2 Applications of GenAI Tools for Research Support

To conceptualise the rationale for GenAI usage within research activities, it is reported that GenAI tools are preferred by postgraduate students for formulating research topics [3]. In addition, students leverage GenAI tools to overcome writer's block . Students perceive GenAI tools as beneficial for suggesting research topics for assignments, simplifying complex concepts, and designing scholarly database search queries [1]. These tools are also perceived convenient for information search [3]. An advantage to the utilisation of these GenAI tools also points to their ease of access without a fee [4].

A considerable amount of literature posits that GenAI tools help to improve English writing skills among students [25, 34]. Furthermore, students also use GenAI models such as Grammarly to proofread their work, and they deploy Copilot for editing [33]. Postgraduate students GenAI tools for contextualising the research background,

discovering literature, and summarising key findings acknowledged that the models are useful [8]. The integration of various GenAI tools further demonstrates that students understand the shortcomings of each GenAI model. Hence, other GenAI tools such as Quillbot are used by students for paraphrasing content [33]. Masters students perceived GenAI tools, particularly ChatGPT, as less useful due to their higher level of knowledge [35].

2.3 Evaluating the Credibility of GenAI Content

Students' confidence in evaluating information is important in the modern age [14]. A thorough understanding of the subject matter is perceived to reinforce students' confidence in assessing the quality and reliability of GenAI outputs for research activities [9]. Despite this, studies indicate significant variation in students' confidence levels regarding this evaluation [3, 35]. It is also opined that students lacks sufficient expertise and confidence to evaluate GenAI content without guidance [3, 20].

The lack of confidence is further worsened by GenAI outputs' inconsistency, as they are prone to bias, errors and limitations in their algorithm [3]. It has been pointed out that students use GenAI content for their research activities but do not fully trust its information [11]. However, students' confidence about GenAI content is only influenced by ease of use and its trustworthy opinions, rather than the quality and reliability of content in the context of research activities [10]. Information and research skills have also been noted as being critical to help evaluate and use GenAI information appropriately [23].

2.4 Barriers and Concerns in GenAI Adoption

The usage of GenAI tools to support students' research activities is associated with various barriers and concerns. The most cited concerns include plagiarism, source fabrication, algorithm bias, and data privacy concerns [5, 37]. Such issues pose a threat to academic integrity, which is central to the values in academia [17]. The mostly cited GenAI drawbacks includes academic dishonesty and vague information [36]. Furthermore, some of the concerns draw on misinformation and bias due to limited knowledge of GenAI [11, 30]. Another concern of GenAI tools is their impact towards students' dependency on them, which impairs their cognitive development [37]. Other scholars pointed to the lack of consistent AI policies within HEIs as a concern for the adoption of these tools to enhance students' research activities [21, 29].

3 Research Methodology

This study investigates postgraduate students' usage patterns and their perceptions towards GenAI to support research activities within a PHEI. A qualitative and quantitative research design using a survey methodology was adopted to meet the research objectives. This mixed-methods approach ensures the reliability, accuracy, and

applicability of the data, enabling a deeper understanding of how postgraduate students use GenAI tools and what influences their attitudes and decisions.

The survey was designed to collect responses from postgraduate students at four campuses of a South African PHEI regarding their usage patterns and perceptions towards GenAI. Postgraduate students were selected for this study because research is a core component of their academic programmes in South Africa, making this group relevant for this study. Their experiences provide valuable insights into how emerging technologies are being integrated into research practices within higher education.

Ethical clearance for this study was obtained from the Research Ethics Committee of the PHEI. A survey questionnaire was developed to investigate postgraduate students' usage and attitudes towards GenAI to support their research activities. The survey questions were designed based on a review of relevant literature. This ensured the inclusion of pertinent themes and attributes to collect current trends on the topic. The questionnaire consisted of three sections: demographic information, GenAI usage behaviours, and concerns about its usage.

4 Results

Table 1 shows the demographical distribution of respondents in terms of gender, age, qualification enrolled for and the faculty. Regarding gender, more than half of the respondents identified as female, followed by male participants accounting for over a third of all participants. A smaller proportion of the participants (just over 5%) identified as LGBTQIA+, while nearly 3% chose not to disclose their gender. This distribution highlights a diverse representation of genders among the study participants. Such diversity contributes to the comprehensiveness and inclusivity of the research findings. In terms of age, most respondents were under 24 years of age, accounting for nearly 63% of the participants. Participants aged 25 to 34 comprised under a fifth of the participants, followed by those aged 35 to 44, accounting for almost 15%. A smaller proportion (5,3%) were aged over 45. This age distribution indicates that the majority of participants are younger. The presence of older participants also provides a broader perspective on GenAI usage across different age groups.

Table 1. Demographical Distribution of Respondents

	Frequency	**Percentage**
Gender		
Male	26	34.7
Female	43	57.3
LGBTQIA+	4	5.3
Chose not to state	2	2.7
Total	*75*	*100*
Age		
Under 24 years old	47	62.7

25–34 years old	13	17.3
35–44 years old	11	14.7
Over 45years old	4	5.3
Total	*75*	*100*
Qualification		
Postgraduate Diploma	26	34.7
Honours Degree	44	58.7
Master's Degree	5	6.7
Total	*75*	*100*
Faculty		
Commerce	20	26.7
Humanities and Social Sciences	19	25.3
Information and Communications Technology	32	42.7
Engineering, Science and Health	4	5.3
Total	*75*	*100*

Regarding the qualifications, most participants are enrolled for an honours degree, followed by a postgraduate diploma, with only a small proportion enrolled for a master's degree. The PHEI offered limited doctoral degrees, and none of these students participated in the study. The presence of students from different qualifications and levels enhances the study's comprehensiveness. The faculty distribution shows that the largest group of participants, with over 40% is from the Faculty of Information and Communications Technology, followed by the Faculty of Commerce with almost 27% and the Faculty of Humanities and Social Sciences with over a quarter of the participants. The Faculty of Engineering, Science, and Health had the smallest representation at 5,3%. This distribution reflects the relevance of GenAI tools among students in various faculties. The varied faculty representation adds depth to the research by incorporating diverse academic perspectives.

4.1 Adoption Patterns, GenAI Tools Usage and Policy Awareness

Fig. 1 below illustrates the participants' responses to the question of whether they use GenAI tools for research support. Almost three-quarters of the participants indicated that they use GenAI tools, while just over a quarter reported not using them. This suggests a strong adoption rate of GenAI tools among the postgraduate students surveyed.

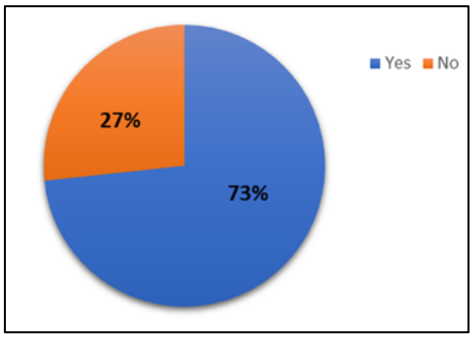

Fig. 1. Usage of GenAI tools for research support

The respondents who use GenAI tools were then asked to indicate which tools they used. Table 2 presents the distribution of GenAI tools used by participants for research support.

Table 2. GenAI tools used

Tool	**Frequency**	**Percentage**
ChatGPT	44	46,8
Scribe	5	5,3
Bard	8	8,5
Co-Pilot	20	21,3
Elicit	6	6,4
Other	11	11,7
Total	*94*	*100*

ChatGPT is the most widely used tool, accounting for almost half of the responses, followed by Co-Pilot with over one-fifth. Bard is used by nearly a tenth, while Scribe and Elicit have less than a tenth each. Moreover, over a tenth of participants reported using other tools not specified in the list. These results highlight ChatGPT's dominant position in research support, while also demonstrating the variety of GenAI tools being explored by students for their academic needs. The diversity in tool usage suggests that postgraduate students are leveraging different platforms based on their specific research requirements. The results also revealed that, in addition to ChatGPT, postgraduate students reported using a variety of other GenAI tools to support their research. These included Perplexity, Elicit, ChatPDF, QuillBot, Meta-AI, and Grammarly.

Fig. 2 illustrates the participants' responses to the question on their level of familiarity with the institution's policy on GenAI. Majority of the respondents indicated that they are familiar with the policy, while only 22% reported that they are not familiar with the policy. This suggests that a significant portion of the students understand the institution's policy on GenAI, although a smaller group remains unaware. The data highlights

the need for further awareness and dissemination efforts to ensure that students are informed about the institution's policies on GenAI.

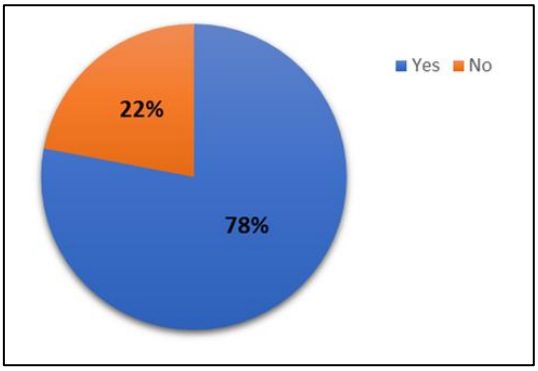

Fig. 2. Familiarity with the institution's policy on GenAI

4.2 Frequency and Reasons for using GenAI Tools for Research Support

The next question asked participants who use GenAI tools to indicate how often they use the tools for research purposes. Fig. 3 illustrates the frequency of the tools' usage.

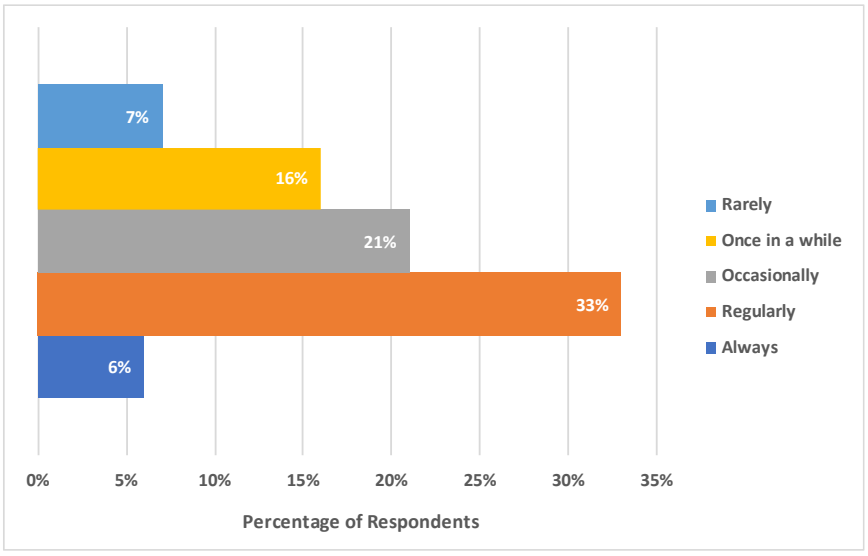

Fig. 3. Frequency of GenAI usage for research purposes

The results show that only 6% of students use GenAI tools for research consistently, while the majority fall within the middle categories — 33% use it regularly, and 38% use it occasionally. Only16% of the respondents use GenAI tools occasionally, and 7% rarely use them.

A follow up question asked for the reason why the respondents use GenAI tools. Fig. 4 provides a view of the various reasons.

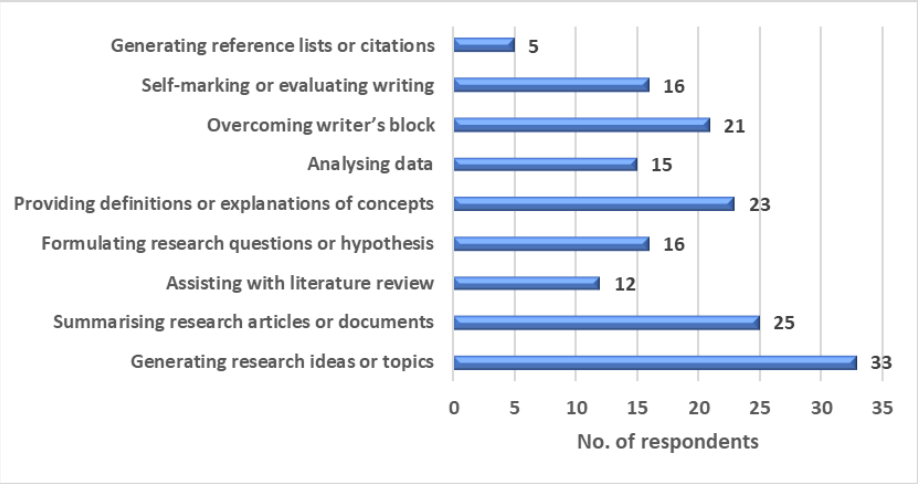

Fig. 4. What students use GenAI tools for

While multiple respondents indicated more than one reason for using GenAI tools, generating research ideas or topics seems to be the biggest reason with 33 respondents. This is followed by summarising research articles or documents (25 responses) and providing definitions or explanations of concepts (23 responses). Overcoming writer's block (21 responses) and assisting with literature reviews (12 responses) also show notable usage. 'Formulating research questions or hypotheses' and 'Self-marking or evaluating writing' were each chosen by 16 respondents. Interestingly, 'Analysing data' shows some level of GenAI tools adoption in data interpretation with 15 responses. The least common use of GenAI tools is for generating reference lists or citations (5 responses), suggesting that students still prefer traditional citation management tools for this task.

4.3 Confidence in Evaluating GenAI-generated Content

Fig. 5 shows the levels of respondents' confidence in evaluating the quality and reliability of content generated by GenAI tools. The results for this question indicate that almost two-thirds of the students (65%) are confident or extremely confident in evaluating the quality and reliability of content generated by GenAI tools. However, just over a third (35%) of the students have some level of uncertainty.

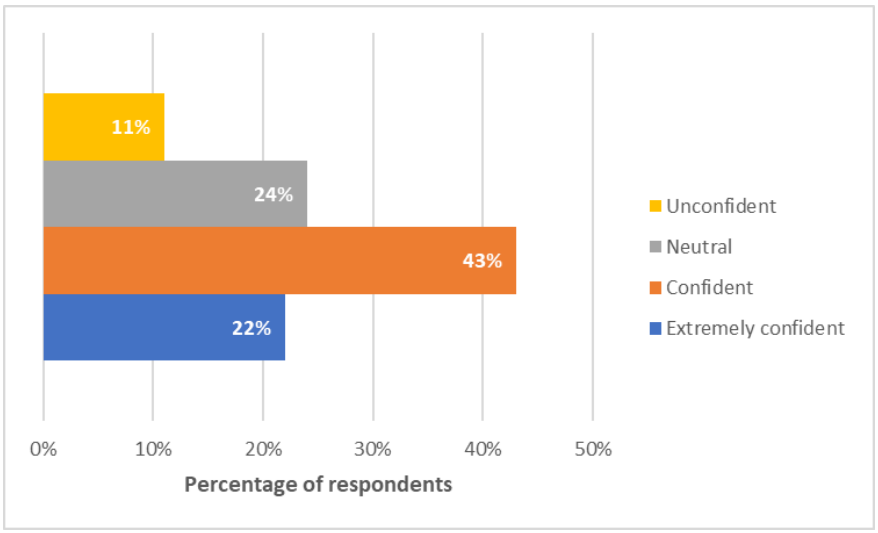

Fig. 5. Confidence to evaluate the quality and reliability of content generated by GenAI tools

4.4 Concerns about the Usage of GenAI for Research Support

Respondents who indicated that they do not use GenAI tools were asked to indicate their reasons. Fig. 6 shows the reasons why participants do not use GenAI tools.

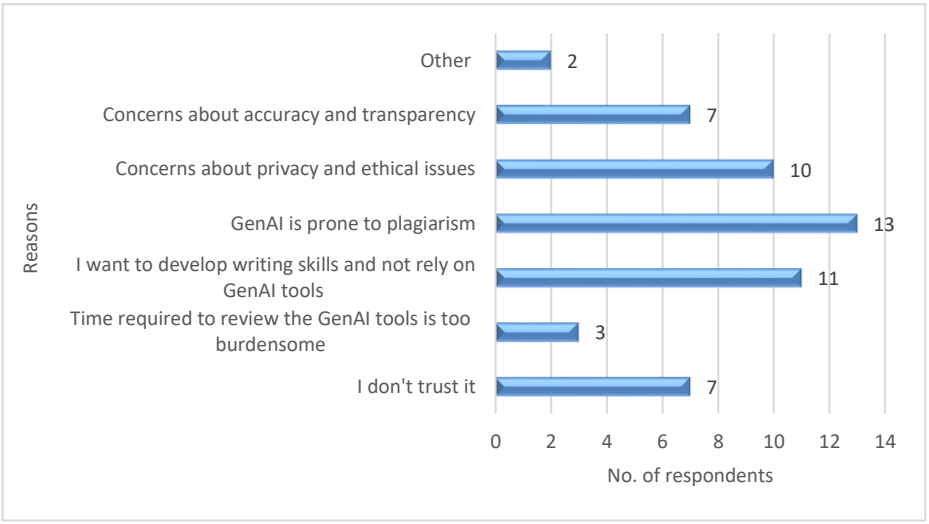

Fig. 6. Reasons for not using GenAI tools

The most frequently cited reason was ‘GenAI is prone to plagiarism’, with 13 respondents. Eleven participants indicated that they wanted to develop their writing skills

and not rely on GenAI tools. 'Concerns about privacy and ethical issues' as a reason for not using GenAI was selected by 10 participants. Seven respondents each identified concerns about 'trust' and 'accuracy and transparency'. Three respondents noted the time required to review the GenAI tools as a reason for not using the tools.

5 Discussion

This study's main objective was to explore the postgraduate students' usage patterns and perception of GenAI tools for research support. The targeted population was the postgraduate students at a South African PHEI. The demographic profile of participants highlights a diverse representation of postgraduate students. More females than males participated in the study, along with a small group identified as LGBTQIA+. The majority of participants were younger with fewer older postgraduate students, which offered a balanced insight into the utilisation of GenAI tools in their research activities. Most respondents were enrolled in honours programmes, followed by postgraduate diploma students, with a smaller set of students at a master's level. Faculty representation also varied, with the highest participation from students in the Faculty of Information and Communication Technology, followed by the Faculty of Commerce and Humanities, while the Faculty of Engineering, Science, and Health had few respondents.

The findings of the study show that the majority of postgraduate students at a South African PHEI use GenAI tools in their research activities. This was no surprise, as various studies have also affirmed the high usage of GenAI tools among students [2, 15]. To complement this high usage, the majority of surveyed postgraduate students are familiar with the institution's GenAI policy. Despite the majority of students being familiar with GenAI policies, some are not acquainted with such policies. Hence, various scholars also advocated for HEIs to develop clear AI policies and guidelines to ensure adequate adoption of GenAI to enhance students research activities [21, 29].

This study found that the majority of postgraduate students prefer to use ChatGPT, followed by CoPilot, Bard, and Scribe. Interestingly, it was found that most undergraduate and master's students had limited experience in using ChatGPT [35]. These findings corroborate previous studies that reported ChatGPT to be the most preferred GenAI model, followed by Bard and CoPilot [1, 18]. However, our study further found that postgraduate students cited a preference for other GenAI tools, which include: Perplexity, Elicit, ChatPDF, QuillBot, Meta-AI and Grammarly. This further demonstrates the versatility of GenAI tools across various research-related processes.
These findings further affirm that postgraduate students do not rely on a single GenAI tool, regardless of ChatGPT being the most preferred model.

Our study found that students use GenAI tools to generate research ideas or topics. This corroborates numerous previous studies, which reported that postgraduate students use GenAI tools to formulate research topics and to simplify complex concepts [8]. While this is the most cited benefit of GenAI tools, students also use these tools to summarise research articles and documents. Despite a lack of trust in the accuracy of GenAI results, postgraduate students leverage these tools to simplify definitions and

complex concepts. GenAI tools have also been found useful for contextualising the research background, discovering literature, and summarising key findings [8].

Interestingly, our study further revealed that postgraduate students use GenAI tools to overcome writer's block. A similar notion was raised that when students experience writer's block, GenAI tools are useful to help them spark ideas and creativity [32]. However, various scholars warned that the reliance on GenAI tools impairs cognitive development [22, 37]. Despite GenAI being helpful to overcome writer's block, postgraduate students use GenAI tools for research support. This includes formulating research questions, hypotheses, discovering literature, and self-marking or evaluating writing. Similarly, our study shows that postgraduate students adopt GenAI tools for analysing their research data. Various studies also highlighted that GenAI tools contribute towards students' learning as they are capable of analysing a vast amount of information [3, 11]. In analysing a vast amount of information, GenAI tools interpret the provided data to yield insights from it [3]. This study also reveals that postgraduate students use GenAI tools to generate reference lists or citations.

Using the GenAI tools requires information evaluation skills that have become critical in the modern digital age [14]. In this study, the majority of postgraduate students rated themselves to be confident in evaluating the quality and reliability of content generated by GenAI tools. It is posited that a thorough understanding of the subject matter reinforces students' confidence in assessing the quality and reliability of GenAI outputs [9]. Various scholars also alluded to the amplification of core foundational skills related to metacognition, information and digital literacy [19, 24, 26].

Few of the surveyed respondents rated their confidence level as neutral. This level of uncertainty in confidence to evaluate GenAI content is attributed to the inconsistent GenAI output [3]. Previous studies also iterated a similar notion that there is variation in students' confidence levels regarding GenAI content evaluation [3, 35]. While our study did not find any postgraduate students who rated themselves unconfident, more than a fifth of the respondents rated themselves extremely confident. In addition, only a small number of postgraduate students express being "somewhat not confident." As a result, students tend to use GenAI content for their research activities, although it is deemed untrustworthy [11].

Postgraduate students are rapidly adopting GenAI tools to enhance their research activities. Despite their enthusiastic perceptions about GenAI to improve their research processes, notable concerns persist. These concerns revolve around plagiarism, misinformation, and the lack of trust towards the quality and reliability of GenAI information. Numerous scholars have associated ethical concerns with compromising the adoption of GenAI tools to enhance postgraduate students' research activities [30, 31].

Our study reveals that surveyed postgraduate students at a South African PHEI are concerned that GenAI content leads to plagiarism. Various studies also cited GenAI drawbacks to include hallucination, academic dishonesty and vague information [34, 36]. These concerns pose a huge threat towards the central values of academic integrity [17].

Despite academic integrity values, postgraduate students demonstrate a lack of trust towards the quality and reliability of GenAI information. As a result, postgraduate students expressed a desire to develop their writing skills without relying on GenAI

models. This resonates with existing literature which suggests that GenAI could diminish the depth of students' engagement with academic material [4, 37].

6 Conclusion

This study examined postgraduate students' use and perceptions of GenAI as a research support tool in a South African PHEI. The findings suggest a strong adoption rate of GenAI tools among the postgraduate students surveyed. The results also indicate that the students use GenAI tools to overcome writer's block, discover literature and analyse data. The study highlighted that GenAI tools are transforming postgraduate research processes by aiding postgraduate students with generating research ideas or topics, summarising research articles, and simplifying complex concepts. The high adoption rate and diversity of GenAI applications indicate their potential to improve research processes.

Despite heavy usage, various concerns overshadow the adoption of GenAI tools. Among these, plagiarism, misinformation, and privacy issues hinder some postgraduate students from fully adopting GenAI tools. Concerns raised by postgraduate students not using GenAI tools emphasise a need for a balanced and critical approach within HEIs. In addition, the students are concerned about the over-reliance of GenAI tools; thus, they prioritise their writing skills. These findings contribute significantly to the HEIs' stakeholders responsible for students' research support activities. Based on ethical and privacy concerns, higher institutions should provide clear guidelines on the ethical use of GenAI tools. Such guidelines should address how GenAI tools could be formally integrated to support students' research activities without compromising academic integrity. There should also be thorough training and support to help students understand the risks of using GenAI in their activities, such as data privacy and bias, which could be taught through digital and information literacy programmes. Furthermore, there is a need to conduct longitudinal studies about GenAI's impact towards research skills, cognitive development and academic performance.

Disclosure of Interests. The authors have no competing interests to declare that are relevant to the content of this article.

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