



## **APPRAISAL OF COMPETENCY, UTILIZATION AND ETHICAL COMPLIANCE IN THE USE OF GENERATIVE ARTIFICIAL INTELLIGENCE FOR ACADEMIC RESEARCH WRITING AMONG POSTGRADUATE GEOGRAPHY STUDENTS IN KANO STATE, NIGERIA**

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### **Abstract**

The integration of Generative Artificial Intelligence (GenAI) tools such as Scite, Elicit, and Consensus into academic writing is rapidly transforming research processes across disciplines. This study appraises the competency, utilization and compliance to ethical practices in using GenAI in academic research writing among postgraduate Geography students in Federal and State Universities within Kano State, Nigeria. The study was guided by three objectives and three corresponding research questions and null hypotheses. Using descriptive survey, data were collected by means of online survey through Generative Artificial Intelligence's Competency, Utilisation and Ethical Practices Scale (GenAI-CUES) from 110 participants. The instrument was validated and internal consistency established by using split-half and an index of 0.78 was obtained. The data collected was analysed using frequency, percentage, expected and observed median and one sample Wilcoxon signed-rank test at 0.05 level of significance. It was revealed that the postgraduate Geography students are moderately using GenAI in academic research writing and their overall competency level and compliance to ethical practices are significantly minimal. In view of these, it was recommended that the Universities should integrate application of GenAI tools in advanced research method courses and organize hands-on training sessions to strengthen students' skills and compliance to ethical considerations in order to ensure academic integrity, responsible authorship and the avoidance of plagiarism or misuse.

**Keywords:** Generative Artificial Intelligence (GenAI), Geography Education, Academic Research Writing.

### **Introduction**

In recent years, generative artificial intelligence (GenAI) tools such as large language models (Deepseek, Scispace, Concensus, ChatGPT, Google Gemini, Anthropic Claude, Meta LLaMA and many more) and automated writing assistants (Grammarly, Quillbot, Jasper AI, Writefull, Wordtune) have become increasingly prominent in academic research writing. These tools demonstrate considerable significance in enhancing scholarly productivity by facilitating literature reviews, finding research gap, improving writing and

grammar, supporting data analysis and strengthening the formulation of well-structured arguments. However, the use of GenAI in research depends largely on three interrelated dimensions; users' competency (skills and literacy), the extent of utilization across various stages of research writing and compliance to ethical considerations that ensure integrity and credibility in academic work.

Competency in the utilisation of GenAI encompasses the knowledge, skills and abilities that enable users to make use of



these tools effectively and responsibly. It involves awareness of available tools, skills in prompt writing, the ability to evaluate outputs critically for errors, bias and the integration of human judgment to ensure originality and accuracy. Scholarly interest in GenAI competency has grown in recent years, with studies increasingly examining postgraduate students' engagement with these tools. Evidence suggests that postgraduate students are progressively adopting GenAI in academic practices, with findings pointing from moderate (Chan & Hu, 2023; Aldulaijan & Almalky, 2025; Segooa, Modiba & Motjoloane, 2025) to high competency levels (Rahman et al., 2024; Asante & Frempong, 2025). Similarly, studies across regions indicate moderate to high knowledge and willingness to use GenAI for academic writing and research processes (Suglo, Mejira, Bayor, Nyemewero & Godfred, 2024; Razak, Abdullah, Ahmad, Bakar & Misaridin, 2024; Asante & Frempong, 2025). These studies highlight that students are not only aware of the existence of GenAI but are also able to deploy it in tasks such as information synthesis, research support and academic writing. Effective and proper utilisation of these tools depends squarely on the user's level of capability and ability to adhere to ethical considerations.

Utilization of GenAI in academic research is concern with how someone actively applies generative artificial intelligence tools in academic research writing. This include the specific stages of the academic research writing process where these tools are employed, the frequency of use, and the range of tasks they support. Empirical evidence indicates that students commonly engage GenAI at multiple points throughout the research process which include; idea generation, literature exploration, drafting, editing and refining written outputs. Segbenya, Bervell, Frimpong-Manso, Otoo,

Andzie and Achina (2023) report that most postgraduate students rely on GenAI for tasks such as academic writing, language polishing, literature searches and brainstorming.

Applications of GenAI in research often enhance efficiency, support academic creativity, enhance competence and improve the clarity and coherence of research outputs. According to Oliinyk, Bulavina, Romanenko, Tatarnikova and Smirnov (2024), the use of GenAI tools contributes to the development of substantive knowledge, research design capabilities, procedural proficiency and communication skills. These enhancements suggest that when used strategically, GenAI can complement traditional academic skills and foster deeper engagement with complex research process. However, the growing reliance on GenAI technologies is not without risks. Zhai, Wibowo and Li (2024) cautioned that excessive dependence on these tools may undermine essential scholarly competencies such as critical thinking, creativity, and independent problem-solving. Moreover, they highlighted potential ethical challenges, including heightened risks of plagiarism, the dissemination of misinformation and violations of academic integrity standards. These concerns underscore the importance of balanced and critical engagement with GenAI tools where human judgment, verification, and ethical awareness remain central to the research process.

Ethical practices or consideration in the use of GenAI for research entails responsible and righteous application of AI tools in academic work in such a way it will ensure transparency, accuracy, fairness and accountability. It involves disclosing the use of AI, safeguarding data privacy, avoiding plagiarism, critically evaluating outputs for bias or errors and upholding intellectual integrity without undermining originality, authorship and research quality (Limongi,



2024; Sharma & Ghosh, 2025). Although ethical guidelines for AI in research have been widely articulated, studies indicate a persistent gap between principles and practice. Postgraduate students are rapidly adopting GenAI tools in academic activities. However, many lack the requisite knowledge and skills to engage with these tools responsibly, thereby raising concerns about possible ethical violations. Empirical evidence shows that students often demonstrate moderate levels of awareness and commitment to ethical standards and their practical adherence is limited due to unclear institutional policies, inadequate training and lack of explicit guidance (Sariyasa & Monika, 2023; Hegazy et al., 2024). In light of these challenges, institutions are being urged to develop robust policies and curricula that promote the responsible integration of GenAI into postgraduate research. English, Nash and Mackenzie (2025) emphasize the importance of embedding AI literacy and ethics into higher education programs to equip students with both technical competence and ethical sensitivity.

At the broader academic level, universities and publishers are increasingly adopting regulatory measures to ensure ethical use of AI. Policies now commonly mandate the disclosure of AI involvement in research processes and publications, thereby promoting accountability and safeguarding academic integrity (Cornell Research & Innovation, 2024). These developments suggest a growing recognition of the need to balance the opportunities offered by GenAI with clear ethical boundaries that preserve the credibility of research.

Despite these emerging insights on the GenAI application in academic research writing, significant gaps remain in understanding postgraduate students' competency and utilization of GenAI in

research writing as well as level of compliance to ethical issues in certain disciplinary and geographical contexts. In particular, little is known about how postgraduate Geography students in Nigeria and more specifically in Kano State, Nigeria utilize GenAI for academic research writing. These gaps underscore the need for focus investigations to determine the extent of students' competencies, utilization and adherence to responsible GenAI practices within this context. Geography as a discipline requires integration of diverse data sources including spatial analysis, GIS, field data and qualitative/quantitative synthesis which may shape both the competency required and the ways GenAI tools can be utilized. Assessing the levels of competency, degree of utilization and ethical adherence in this context is therefore important for several reasons. It can help universities design training and support programs to enhance students' AI literacy, it can expose ethical risks or misunderstandings which can affect research quality, It can also inform institutional policies on authorship norms, plagiarism detection and responsible GenAI integration.

This study is anchored on the **Technology Acceptance Model (TAM)** developed by Davis (1989), which explains users' acceptance and utilization of technology based on two major constructs; *perceived usefulness* and *perceived ease of use*. According to Davis, the extent to which an individual perceives a technology as beneficial for enhancing performance (perceived usefulness) and finds it free of effort to use (perceived ease of use) largely determines their intention to adopt and effectively utilize such technology.

In the context of this study, TAM provides a suitable framework for examining postgraduate Geography students' interaction with GenAI tools in academic



research writing. Students' **competency** in using these tools can be linked to their perceived ease of use, while **utilization** of these tools reflects perceived usefulness. Furthermore, compliance to ethical **practices** can be interpreted as a moderating factor influencing the acceptance and responsible application of GenAI tools. Thus, TAM helps to explain not only why students adopt GenAI tools but also the degree of competency and ethical awareness/adherence demonstrated in academic research writing.

### Objectives of the Study

The main aim of the study is to appraise postgraduate Geography students' level of competency, utilization and compliance to ethical practices when using generative artificial intelligence in academic research writing in Kano State, Nigeria. However, the study was pinned on the following specific objectives.

- (iv) To assess the level of competency of postgraduate Geography students in the use of generative AI tools for academic research writing.
- (v) To examine the extent to which postgraduate Geography students utilize generative AI tools in academic research writing.
- (vi) To evaluate postgraduate Geography students' compliance to ethical practices when using generative AI for academic research writing

### Research Questions

Based on the objectives of the study, the following research questions were developed to guide the study.

- (3) What is the level of competency of postgraduate Geography students in the utilisation of generative AI tools for academic research writing?
- (4) What is the extent of postgraduate Geography students' utilization of

generative AI tools in academic research writing?

- (5) What is the postgraduate Geography students' practices regarding the **ethical use of generative AI** in academic research writing?

### Null Hypotheses

Similarly, in accordance with the objectives of the study, the following hypotheses were formulated and tested at 0.05 level of significance.

- Ho1:** Postgraduate Geography students in Kano State do not differ significantly in their level of competency in utilization of generative AI for academic research writing from the benchmark median score.
- Ho2:** Postgraduate Geography students in Kano State do not differ significantly in their level of utilization of generative AI for academic research writing from the benchmark median score.
- Ho3:** Postgraduate Geography students in Kano State do not differ significantly in their compliance to ethical practices when using generative AI for academic research writing from the benchmark median score

### Methodology

This study employed a descriptive research design, as it focuses on investigating the levels of competency, utilization, and compliance to ethical practices involved in using Generative AI in academic research writing among postgraduate students. The aim is not to manipulate variables or establish cause-and-effect relationships. The population comprised of 170 postgraduate Geography students in Federal and State Universities in Kano State. Given the



relatively small population size, a census approach was adopted whereby all eligible students were involved in the study. However, only 110 students completed and returned the scale, representing a response rate of 64.7%, while 60 students did not respond. Thus, no sampling was conducted. Data were gathered using the **Generative Artificial Intelligence's Competency, Utilisation and Ethical Practices Scale (GenAI-CUES)**, which covered the constructs of competency and utilization with a baseline score of 20 to 100 points each, and ethical practices with a baseline score of 10 to 50 points in three separate sections respectively. Face and content validity of the instrument was established by three senior lecturers in Bayero University. Moreover, internal consistency was established using the split-half method, resulting in a Cronbach Alpha coefficient of 0.78. The coefficient was deemed reliable.

Descriptive statistics involving frequency, percentage and median were used to answer the research questions. The median was chosen because it provides a robust measure of central tendency for ordinal or non-normally distributed data. The hypotheses were tested through non-parametric inferential analysis using **one-sample Wilcoxon signed-rank test** at 0.05 level of significance. The participants' responses on competency and utilization were compared against the benchmark median score of 60, whereas for compliance to ethical principles the benchmark median score of 30 was used. This test was appropriate given the non-parametric nature of the data and its suitability for testing medians against hypothesized or benchmark values.

### Data Analysis and Results

**Research Question One:** What is the level of competency of postgraduate Geography students in the utilisation of generative AI tools for academic research writing?

**Table 1: Level of Competency of Postgraduate Geography Students in the Use of Generative AI Tools for Academic Research Writing.**

| Score Range  | Competency Level (Indicator) | Description of Competency                        | Number & Percentage |
|--------------|------------------------------|--------------------------------------------------|---------------------|
| 20 - 29      | Not Competent At all         | Cannot use GenAI at all                          | 22(20.00%)          |
| 30 - 49      | Minimally Competent          | Requires a lot of help to use GenAI effectively  | 45(40.91%)          |
| 50 - 69      | Moderately Competent         | Require little guidance to use GenAI effectively | 22(20.00%)          |
| 70 - 89      | Highly Competent             | Can use GenAI independently                      | 15(13.64%)          |
| 90 - 100     | Extremely Competent          | Can teach others how to use GenAI effectively    | 6(5.45%)            |
| <b>Total</b> |                              |                                                  | 110(100%)           |

The results in Table 1 show that among the postgraduate Geography students, majority fall within the lower levels of competency in the use of Generative AI for research. Out of 110 students, the largest group representing

40.91% (45 students) are minimally competent and thus requiring a lot of help to use GenAI effectively. Another 20.00% (22 students) are not competent at all, meaning they cannot use GenAI in their academic



work. Similarly, 20.00% (22 students) are moderately competent and require little guidance to use GenAI effectively. Only 13.64% (15 students) are highly competent and can use GenAI independently. The smallest group with 5.45% (6 students) is extremely competent and could not only use GenAI effective in research but also can teach others.

Overall, these findings suggest that majority of the postgraduate Geography students, about 61.91% remain at low to minimal competency levels, while only 19.09% are in

the higher categories of competency. Besides, 20.00% fall within the moderate level, showing potential but still require some guidance. This distribution indicates a significant competency gap with most students struggling to use GenAI effectively in academic research.

**Null Hypothesis One:** Postgraduate Geography students in Kano State do not differ significantly in their level of competency in utilization of generative AI for academic research writing from the benchmark median score.

**Table 2: One Sample Wilcoxon Signed-Rank Test's Result on Postgraduate Students' Competency in Using GenAI for Research Writing**

| Variable   | N   | T         | Z      | Benchmark Median | Observed Median | p     | r      | Decision    |
|------------|-----|-----------|--------|------------------|-----------------|-------|--------|-------------|
| Competency | 110 | 1,428.500 | -4.844 | 60.00            | 41.00           | <.001 | - 0.46 | Ho Rejected |

Table 2 presents the results of a one-sample Wilcoxon signed-rank test, which showed that  $T = 1,428.500$ ,  $Z = -4.84$ , observed  $Mdn = 41.00$ ,  $p < .001$ , and  $r = -.46$ . Given that the p-value ( $< .001$ ) was less than the level of significance ( $\alpha = .05$ ), the null hypothesis was rejected in favour of the alternative hypothesis. This indicates that the observed median competency score ( $Mdn = 41.00$ ) was significantly lower than the benchmark median score ( $Mdn = 60$ ). The

results suggest that postgraduate Geography students generally demonstrated significantly low competency in the use of generative AI for academic research writing, with a medium effect size ( $r = -.46$ ) (Cohen, 1988).

**Research Question Two:** What is the extent of postgraduate Geography students' utilization of generative AI tools in academic research writing?

**Table 3: Extent of Utilisation of Generative AI in Research Writing by Postgraduate Geography Students**

| Score Range  | Usage Level (Indicator) | Description of Usage                                                                     | Number & Percentage |
|--------------|-------------------------|------------------------------------------------------------------------------------------|---------------------|
| 20 - 29      | Not at all Use          | Never use GenAI tools in research                                                        | 20(18.18%)          |
| 30 - 49      | Rarely Use              | Rarely use GenAI tools in research, mostly rely on other alternative means               | 20(18.18%)          |
| 50 - 69      | Moderately Use          | Occasionally use GenAI tools for research                                                | 40(36.36%)          |
| 70 - 89      | Frequently Use          | Regularly use GenAI tools for research and consider them a common part of academic work. | 20(18.18%)          |
| 90 - 100     | Always Used             | Consistently use GenAI tools for research and rely on them every time.                   | 10(9.09%)           |
| <b>Total</b> |                         |                                                                                          | 110(100%)           |



The results in Table 3 show the usage level of Generative AI (GenAI) tools for research among postgraduate Geography students based on their score ranges. Out of the 110 respondents, the largest proportion, representing **36.36% (40 students)** fall within the **moderate usage level**, indicating that they occasionally use GenAI tools in their research activities. Furthermore, **36.36% (40 students combined)** are distributed equally between the lower usage categories; **18.18% (20 students)** are classified as *not at all users*, meaning they never use GenAI tools in their research, while another **18.18% (20 students)** are *rarely users*, indicating very limited and occasional use, with a strong reliance on traditional or alternative research methods. Together, these two groups show that a substantial portion of the students (36.36%) are still at the early or non-adoption stage of GenAI usage. Besides, **18.18% (20 students)** fall under the **frequent usage level**, meaning they regularly

use GenAI tools and consider them an important part of their academic work. A smaller proportion, **9.09% (10 students)**, are in the **always-used category**, indicating consistent and heavy reliance on GenAI tools in all or most aspects of their research activities.

Overall, the findings reveal that GenAI usage among postgraduate Geography students is still at a transitional stage. While more than one-third are moderate users, only about one-quarter use GenAI frequently or always. Meanwhile, a sizeable portion of the students demonstrate minimal or no usage at all.

**Null Hypothesis Two:** Postgraduate Geography students in Kano State do not differ significantly in their level of utilization of generative AI for academic research writing from the benchmark median score.

**Table 4: One Sample Wilcoxon Signed-Rank Test's Results on Postgraduate Students' Utilisation of GenAI for Research**

| Variable    | N   | T         | Z    | Benchmark Median | Observed Median | p    | r   | Decision    |
|-------------|-----|-----------|------|------------------|-----------------|------|-----|-------------|
| Utilisation | 110 | 3,035.500 | .455 | 60.00            | 63.00           | .649 | .04 | Ho Accepted |

Table 4 presents the results of a one-sample Wilcoxon signed-rank test,  $T = 3,035.500$ ,  $Z = 4.55$ , observed  $Mdn = 63.00$ ,  $p = .649$  and  $r = .04$ . Since the p-value (.649) was greater than the level of significance ( $\alpha = .05$ ), the null hypothesis was retained. This indicates that the observed median utilisation score ( $Mdn = 63.00$ ) did not differ significantly from the benchmark median score ( $Mdn = 60$ ). The findings suggest that postgraduate

Geography students' utilization of generative AI for academic research writing was comparable to the expected threshold, with a small or negligible effect size ( $r = .04$ ) (Cohen, 1988).

**Research Question Three:** What is the postgraduate Geography students' practices regarding the **ethical use of generative AI** in academic research writing?

**Table 5: Postgraduate Geography Students' Practices Regarding the Ethical Use of Generative AI in Academic Research Writing**

| Score Range  | Usage Level (Indicator) | Description of Usage                                                                                                          | Number & Percentage |
|--------------|-------------------------|-------------------------------------------------------------------------------------------------------------------------------|---------------------|
| 10 - 14      | Never                   | Does not use ethical principles when using GenAI for research.                                                                | 48(43.64%)          |
| 15 - 24      | Rarely                  | Rarely acknowledges ethical issues but does not consistently apply them.                                                      | 30(27.27%)          |
| 25 - 34      | Sometimes               | Occasionally apply some ethical principles when using GenAI for research.                                                     | 18(16.36%)          |
| 35 - 44      | Often                   | Regularly incorporates ethical considerations into most research activities and consider them a common part of academic work. | 10(9.09%)           |
| 45 - 50      | Always                  | Consistently upholds the highest ethical standards in all research activities                                                 | 4(3.64%)            |
| <b>Total</b> |                         |                                                                                                                               | 110(100%)           |

Results in Table 5 revealed that the application of ethical practices among postgraduate Geography students in the use of Generative AI for research is generally low. A significant proportion of the postgraduate students, representing 43.64% (48) reported that they do not apply ethical principles at all in using GenAI for research. This indicates widespread neglect of ethical standards. Furthermore, 27.27% (30) rarely acknowledge ethical issues and do not consistently apply them, which suggest limited awareness and weak commitment to ethical considerations. 16.36% (18) of the postgraduate students occasionally apply some ethical principles but this remains irregular and unreliable. Only 9.09% (10) of the respondents reported that they often incorporate ethical considerations into the

use of GenAI for research activities, making it a common part of their academic work, while just 3.64% (4) consistently uphold the highest ethical standards in academic practices.

Therefore, the results show that the majority of the postgraduate students, accounting for 70.91% (78) either never or rarely apply ethical principles in research involving the use of Generative AI. In contrast, only a very small fraction, 12.73% (14) integrate ethical considerations regularly or consistently.

**Null Hypothesis Three:** Postgraduate Geography students in Kano State do not differ significantly in their compliance to ethical practices when using generative AI for academic research writing from the benchmark median score

**Table 6: One Sample Wilcoxon Sign Rank Test's Result on Postgraduate Students' Practices Regarding the Ethical Use of Generative AI in Academic Research Writing.**

| Variable    | N   | T       | Z      | Benchmark Median | Observed Median | p     | r     | Decision    |
|-------------|-----|---------|--------|------------------|-----------------|-------|-------|-------------|
| Utilisation | 110 | 599.500 | -7.189 | 30.00            | 15.50           | <.001 | -0.69 | Ho Rejected |



Table 4 presents the results of a one-sample Wilcoxon signed-rank test,  $T = 599.500$ ,  $Z = -7.189$ , observed  $Mdn = 15.50$ ,  $p < .001$  and  $r = -0.69$ . Since the  $p$ -value ( $< .001$ ) was less than the level of significance ( $\alpha = .05$ ), the null hypothesis was rejected in favour of the alternative hypothesis. This indicates that the observed median score ( $Mdn = 15.50$ ) was significantly lower than the benchmark median score ( $Mdn = 30.00$ ) for compliance to ethical practices. The findings suggest that postgraduate Geography students exhibited a significantly low level of compliance to ethical practices in the use of generative AI for academic research writing, with a large effect size ( $r = -0.69$ ) (Cohen, 1988).

### Summary of Major Findings

1. The majority of postgraduate Geography students generally demonstrated significantly low to minimal competency in the use of generative AI for academic research writing.
2. Most of postgraduate Geography students exhibited significant moderate utilization of generative AI for academic research writing.
3. Most postgraduate Geography students were found to have a significantly low compliance to ethical practices in the use of generative AI for academic research writing.

### Discussion of Findings:

The study established that the majority of postgraduate Geography students generally demonstrated significantly low to minimal competency in the use of generative AI for academic research writing. While many postgraduate students express interest in and awareness of generative AI tools, their actual proficiency remains weak. To buttress this, a large proportion of students fell into the low to minimal competency level, suggesting that they may lack the training, hands-on

experience or scaffolding needed to move beyond superficial engagement. From the perspective of the Technology Acceptance Model (TAM), this finding may reflect limited perceived ease of use and insufficient facilitating conditions, which can hinder users from developing deep operational competence even when awareness exists. This pattern resonates with prior research. This pattern resonates with prior researches. Suglo et al. (2024) found that although postgraduates had moderate to high knowledge and willingness to use generative AI, their actual competency and confidence in applying these tools for research purposes were not robust and prompting. Similarly, Aldulaijan and Almalky (2025), Chan and Hu (2023), and Segooa, Modiba and Motjoloane (2025) each documented instances of shallow or low competency in the use of AI tools.

The study also revealed that most of postgraduate Geography students exhibited significant moderate utilization of generative AI for academic research writing. Within the framework of the Technology Acceptance Model (TAM), the moderate level of utilization may be attributed to students' positive behavioral intention to use generative AI, driven by its perceived usefulness. However, the observed moderate utilization, despite low competency levels, suggests a gap between actual use and effective mastery of the technology. This finding is in line with the findings of many researches across higher education, including Geography and related disciplines. For instance Chan and Hu (2023) indicated that many students reported using AI tools to save time, receive feedback and enhance digital competence, reflecting moderate but growing integration into their academic routines. Similarly, English, Nash and Mackenzie (2025), and Aldulaijan and Almalky (2025) reported a moderate level of usage among postgraduate students.



The last finding expressed that most postgraduate Geography students were found to have a significantly low compliance to ethical practices in the use of generative AI for academic research writing. Within the TAM framework, the observed low ethical compliance may reflect inadequate perceived behavioural control and a weak internalization of ethical use standards, highlighting a disconnect between technology adoption and responsible utilization. This finding is in congruent with some existing researches. It was highlighted that many postgraduate students, while increasingly using generative AI for academic research writing, often exhibit low levels of compliance to ethical standards such as transparency, proper attribution and academic integrity. For instance in a study involving graduate students indicated that many used AI as a collaborative tool without always maintaining clear boundaries regarding authorship and originality (Sabbaghan and Eaton, 2025). Moreover, study conducted by Bozkurt (2024) and Chanpradit (2025) revealed that students often rely on AI-generated content without sufficient critical evaluation or personalization, raising concerns about plagiarism and the erosion of scholarly ethics.

Besides, the literature frequently raises concerns that students fail to follow ethical guidelines when using GenAI. Issues such as ghost authorship (not disclosing AI assistance), uncritical acceptance of AI outputs and unattributed reuse of generated text are common red flags. These practices highlight a weak level of ethical awareness and practice among students and suggest the need for interventions such as training, workshops or policy enforcement to promote responsible and ethical use of Generative AI in academic research.

## Conclusion

The findings indicate that most postgraduate Geography students demonstrate a significant limited competency in the application of generative AI for academic research writing. Nonetheless, their level of utilization of these tools is generally moderate, reflecting a positive behavioural intention to use driven by perceived usefulness, while their compliance to ethical practices remains evidently low. This interplay of limited proficiency, moderate engagement and insufficient ethical compliance underscores a significant gap in both technical capacity and responsible use.

### 1. Recommendations

2. Based on the findings of the study the following recommendations were made.
3. The Universities should integrate application of generative AI tools in advanced research method courses and organized hands-on training sessions to strengthen students' competency in applying these tools for academic research writing. This is order to ensure the students acquire both technical skills and confidence in effective use of GenAI for research.
4. The Universities should integrate structured and guided opportunities for the responsible utilization of generative AI, enabling students to progress from transitional use toward more advanced, effective, and purposeful application in academic research.
5. The Universities should develop and enforce clear ethical frameworks for the responsible use of generative AI, so as to ensure academic integrity, responsible authorship and the avoidance of plagiarism or misuse.



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