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Impact of Generative AI in Academic Integrity and Learning Outcomes: A Case Study in the Upper East Region

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Authors' contributions

This work was carried out in collaboration among all authors. Author JKW designed and conducted the study, performed statistical analysis, wrote the protocol, and drafted the initial manuscript. Author NSA and HZ conducted literature searches and provided critical feedback on the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

With the increasing use of Generative Artificial Intelligence (AI) tools like ChatGPT and Bard, universities face challenges in maintaining academic integrity. This research investigates the impact of these tools on learning outcomes (factual knowledge, comprehension, critical thinking) in selected universities of Ghana's Upper East Region during the 2023-2024 academic year. The study specifically analyzes changes in student comprehension and academic integrity concerns when using Generative AI for content generation, research assistance, and summarizing complex topics. A mixed-methods approach was employed, combining qualitative data from interviews and

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open-ended questions with quantitative analysis of survey data and academic records. The research focuses on three institutions: C. K. Tedam University of Technology and Applied Sciences, Bolgatanga Technical University, and Regentropfen University College. A purposive sampling technique recruited 150 participants (50 from each university) who had used Generative AI tools. Key findings show that 72% of students reported improved understanding of course material through Generative AI use, yet 75% cited academic integrity as a primary concern. Quantitative analysis revealed a weak to moderate positive correlation (r = 0.45) between AI tool usage and improved grades, with variations depending on the specific AI tasks performed. Qualitative data highlighted concerns about overreliance on AI and its impact on critical thinking skills.

This research contributes to the ongoing debate on AI's role in education by providing valuable insights for educators and policymakers worldwide. The findings suggest that while AI tools can enhance comprehension, ethical considerations and potential drawbacks related to critical thinking require careful attention. The study concludes with recommendations for integrating AI literacy programs, developing ethical guidelines, and implementing advanced plagiarism detection systems to harness the benefits of Generative AI while mitigating risks to academic integrity. Although specific to the Upper East Region of Ghana, these insights may be applicable to other educational systems with similar characteristics.

Keywords: Generative AI; academic integrity; learning outcomes; higher education; Upper East Region.

ABBREVIATIONS

AI : Artificial Intelligence
BTU : Bolgatanga Technical University
RUC : Regentropfen University College
CKT-UTAS: C. K. Tedam University of Technology and Applied Sciences
GPA : Grade Point Average
Numpy : Numerical Python
Pandas : Panel Data
ChatGPT : Chat Generative Pre-trained Transformer
GenAI : Generative Artificial Intelligence

1. INTRODUCTION

The rapid growth of Artificial Intelligence (AI) technologies has been widely embraced in industries, including the field of education [1, 2]. One significant development is Generative AI, which has the ability to independently generate not content but also mimic human interactions produce realistic images and videos and even create music and literature [3]. However, there are concerns, about how this technology may impact integrity and learning outcomes within education institutions [4]. This study aimed to explore the impact of Generative AI in selected universities in the Upper East region particularly examining its effects, on students' academic practices and achievements.

While Generative AI holds, promise in improving experiences there is a growing worry, about its misuse [5]. Generative AI has the ability to enhance learning by using tutoring systems that customize educational material based on individual student requirements [6, 7, 8]. It can also streamline tasks giving educators time to engage with students and provide personalized teaching [9]. Moreover, AI driven tools can offer feedback on student progress improving their grasp and retention of ideas [10, 11]. Despite these advantages there are issues surrounding the credibility of AI generated content and its impact, on honesty [12, 13].

This research discovered the release of Generative AI in academic setups to recognize its impact on conventional academic standards. It checks out exactly how trainees communicate with AI-generated material coupled with checks out the honest measurements bordering its make use of in projects, research study documents as well as discovering products [14,15]. It looks at the honest measurements bordering the more comprehensive use Generative AI, consisting of its function in automating management jobs, supplying tailored understanding experiences along with promoting real-time comments on trainee efficiency. Even more, the research study intends to analyze whether Generative AI improves or threatens trainees' academic stability as well as finding out results in the area's college establishments [16, 17, 18]. With thorough evaluation along with empirical examination, this paper intends to supply understandings that will certainly notify plans and methods for the accountable assimilation of Generative AI in academic contexts.

2. RELATED WORKS

Generative Artificial Intelligence (AI) is quickly changing college offering both interesting chances as well as considerable obstacles throughout numerous domain names. Current researches have actually thoroughly discovered this effect. As an example, Sevnarayan as well as Potter [19] highlighted just how "Generative AI" devices like ChatGPT are redefining training as well as understanding characteristics in range education and learning. Their research underscores the possibility of AI to advertise accountable usage plus assistance student-centered campaigns [20]. Certifying techniques utilizing meetings and also emphasis teams [21] have actually been important in catching varied risk holder point of views on incorporating AI right into instructional setups.

Researches have actually revealed that "Generative AI" can improve academic methods [2] AI's capacity to provide tailored finding out experiences, automate evaluations coupled with help with material development not just boosts academic results however additionally cultivates partnership interaction plus AI proficiency amongst instructors and also pupils [22]. Pesovski, et al., [2] had better show this by recommending AI-driven devices for personalized understanding experiences, which properly involve pupils through differed understanding products as well as self-assessment devices resulting in raised research study time and much better discovering results.

However, the widespread adoption of AI tools like ChatGPT also raises significant ethical considerations in academic contexts. Hutson, [23] explored how AI challenges traditional notions of plagiarism and academic integrity. Issues surrounding data privacy, transparency, and the balance between AI assistance and human oversight are critical considerations in maintaining academic standards while leveraging AI's capabilities [24]. Perera and Lankathilake [25] delved into global university policies on AI and academic integrity, advocating for comprehensive strategies like the 3E Model. This model aims to enhance assessment practices and guide ethical AI use in higher education [26, 27, 28].

The benefits of AI are not limited to academic success. Jaboob, [29], mentioned AI's contribution to the cognitive development of students in higher Arab education, which showed favorable impacts, achieved using various AI techniques and applications. Their results were verified by using Structural Equation Modeling (SEM-PLS), which helped explain student experience improvements in learning, analyzing associations between different aspects such as teaching quality, peer interaction, student engagement, and learning resources on their effects on students' experiences in learning. Most importantly, these hypothetical results showed how all the elements had positive influences on various aspects of student learning experiences before each factor supported some form of positive impact on students' learning experiences [30-32]. Specifically, the negative result for learning resources may signify that almost all students were satisfied with their learning resources, but it did not contribute to their learning outcomes. Consequently, the results showed that teaching quality showed the most positive effect, followed by student engagement, learning resources, and peer interaction. This emphasizes the need to improve aspects of this area of higher educational practice to create the needed system that generates better educational outcomes, which ultimately will create enriching learning experiences for students, Baba Yidana et al., [33].

In response to potential drawbacks, [34, 10] proposes modified flipped learning as a solution. This approach integrates AI for pre-class activities while emphasizing human input, thereby balancing automation with critical thinking development. Looking beyond academia, AI-based transformation projects are demonstrably enhancing organizational performance across various sectors [35, 36]. These projects drive efficiency, innovation, and competitive advantage in business operations.

3. METHODOLOGY

This research utilized a case study approach focusing on selected University in the upper east region, namely C. K. Tedam University of Technology and Applied Sciences, Bolgatanga Technical University, and Regentropfen University College. Multiple data collection method were used to acquire detailed understandings right into the influence of Generative AI on academic integrity as well as learning out coming. A mixed-method method was taken on, incorporating both qualitative and quantitative data to offer a well-shaped understanding of the topic.

Table 1. Thematic Classification of Literature Review

Theme	Author	Year	Focus	Key Findings
Academic Integrity	Sevnarayan et al.,[19]	2024	Examines the role of GenAI in higher education, focusing on its impact on distance education, academic integrity, and student voices in a South African open distance and e-learning university.	Highlights the need to balance AI's challenges with its potential to enhance student engagement and learning outcomes. Emphasizes the necessity of ongoing exploration and strategic development to address ethical concerns and leverage AI for educational improvement.
	Kruger-Roux et al.,[20]	2024	Investigates GenAI's transformative effects on distance education, emphasizing its impact on academic integrity and student voices. Uses qualitative methods for insights.	Aims to bridge the gap between negative perceptions of AI and its potential benefits. Underscores the importance of responsible AI use, promoting student-centered initiatives and fostering engagement while addressing ethical issues.
	Lund et al., [37]	2023	Discusses the impact of GenAI on academic writing and plagiarism, comparing actual AI usage with educators' awareness.	Reveals a gap between actual AI usage and educators' awareness. Suggests revising writing curricula to address AI's role, emphasizing the need for human evaluation to ensure academic integrity. AI should enhance, not replace, critical thinking and writing skills.
	Hutson et al., [23]	2024	Investigates the challenges and opportunities presented by AI-generated content in academic settings.	Calls for new frameworks to address originality and plagiarism issues in the AI era. Educators should guide students in using AI effectively and responsibly, ensuring AI enhances academic integrity and creativity. Highlights the need for human analysis to verify AI-generated content.
	Bin-Nashwan et al., [38]	2023	Reviews articles and policies from top universities to understand the impact of GenAI on academic integrity.	Identifies themes of enforcing academic integrity, educating stakeholders about ethical AI use, and promoting GenAI for productivity. Proposes a 3E Model to improve academic integrity and assessment practices while exploring effective GenAI tool usage.
Personalized Learning	Perera et al., [25]	2023	Investigates how GenAI can enhance personalized learning, automated assessments, virtual assistants, and content creation in higher education.	Emphasizes the importance of ethical considerations such as data privacy and transparency. Advocates for the responsible use of AI to support academic integrity and improve learning experiences while promoting AI literacy among students and educators.
	Pesovski et al., [8]	2024	Proposes a method for personalizing learning materials using GenAI,	Diverse learning material formats and AI-generated quizzes improve student engagement and self-assessment. However,

Theme	Author	Year	Focus	Key Findings
			integrated into a learning management system.	results have limited generalizability due to the small sample size. Highlights GenAI's potential to enhance personalized learning.
Student Engagement	Pesovski et al., [8]	2024	Proposes a method for personalizing learning materials using GenAI, integrated into a learning management system.	Diverse learning material formats and AI-generated quizzes improve student engagement and self-assessment. However, results have limited generalizability due to the small sample size. Highlights GenAI's potential to enhance personalized learning.
	Kruger-Roux et al., [20]	2024	Investigates GenAI's transformative effects on distance education, emphasizing its impact on academic integrity and student voices. Uses qualitative methods for insights.	Aims to bridge the gap between negative perceptions of AI and its potential benefits. Underscores the importance of responsible AI use, promoting student-centered initiatives and fostering engagement while addressing ethical issues.
	Gilson et al., [34]	2023	Proposes a modified flipped learning model to mitigate the negative impacts of GenAI on education.	Suggests using GenAI for pre-class activities and content creation to balance automation with human input. Addresses ethical and practical concerns related to GenAI, aiming to enhance student engagement and learning outcomes. Calls for further research to evaluate the model's effectiveness.
	Sevnarayan et al., [19]	2024	Examines the role of GenAI in higher education, focusing on its impact on distance education, academic integrity, and student voices in a South African open distance and e-learning university.	Highlights the need to balance AI's challenges with its potential to enhance student engagement and learning outcomes. Emphasizes the necessity of ongoing exploration and strategic development to address ethical concerns and leverage AI for educational improvement.
Ethical Considerations	Gilson et al., [20]	2023	Proposes a modified flipped learning model to mitigate the negative impacts of GenAI on education.	Suggests using GenAI for pre-class activities and content creation to balance automation with human input. Addresses ethical and practical concerns related to GenAI, aiming to enhance student engagement and learning outcomes. Calls for further research to evaluate the model's effectiveness.
	Chan et al., [39]	2023	Explores GenAI's integration into educational practices using qualitative data collection to understand its impact.	Provides a balanced understanding of GenAI's role in education by addressing concerns regarding academic integrity and potential benefits. Offers recommendations for ethical AI integration to align with educational goals.
	Perera et al., [25]	2023	Investigates how GenAI can enhance personalized learning, automated assessments, virtual assistants, and content creation in higher education.	Emphasizes the importance of ethical considerations such as data privacy and transparency. Advocates for the responsible use of AI to support academic integrity and improve learning experiences while promoting AI literacy among students and

Theme	Author	Year	Focus	Key Findings
				educators.
	Nikolopoulou et al., [2]	2024	Focuses on ChatGPT's role in higher education, highlighting its potential to transform teaching and learning through personalized learning and other applications.	AI tools like ChatGPT can enhance teaching and learning practices, promote collaboration, communication, and inclusivity. Ethical considerations, including data privacy and transparency, are crucial for responsible AI use. AI should complement human oversight to maintain academic integrity.

3.1 Research Design

The research study design explored in-depth how Generative AI influenced academic integrity as well as learning outcomes within a specific educational context.

3.2 Study Scope and Target Population

The scope of this study was limited to examining the role of Generative AI on academic integrity and learning outcomes in higher education institutions in the Upper East region Ghana, West Africa. The target population included students and faculty members from C. K. Tedam University of Technology and Applied Sciences, Bolgatanga Technical University, and Regentropfen University College. These institutions were selected due to their diverse academic programs and varying levels of AI technology adoption, providing a comprehensive overview of the impact of Generative AI on different educational contexts.

3.3 Sampling Technique and Size

A purposive sampling method was used in order to make sure the addition people with experience utilizing Generative AI tools and that might offer appropriate understandings. The sample size included about 150 individuals, with 50 people picked from each college. This sample size was selected to make sure enough depiction as well as to promote significant contrasts in between the various institutions [40].

Cochran's formula for sample size calculation was used to determine the appropriate sample size:

$$n_o = \frac{Z^2.p.(p-1)}{e^2}$$

where:

- n_o is the initial sample size.
- Z is the Z-value corresponding to the desired confidence level (e.g., 1.96 for 95% confidence).
- p is the estimated proportion of the population with the attribute of interest (commonly 0.5 for maximum sample size).
- e is the margin of error (e.g., 0.05 for ±5% precision).

For a finite population, the adjusted sample size n is calculated as:

$$n = \frac{n_o}{1 + \left(\frac{n_o - 1}{N}\right)}$$

where:

- n is the adjusted sample size.
- N is the population size.

For this study, the final sample size consisted of approximately 150 participants, with 50 individuals selected from each university, ensuring sufficient representation and facilitating meaningful comparisons. In addition to students, the study also included faculty members.

3.4 Data Collection

1. **Interviews**: Conducted semi-structured interviews with students and faculty members to gather qualitative perspectives on the integration of Generative AI in educational practices.
2. **Surveys**: Administered surveys through the use of questionnaires to assess students' attitudes towards the utilization of AI technologies in academic settings. These surveys included open-ended questions to explore perceptions, concerns, and experiences related to AI in education.
3. **Analysis of Academic Records**: Analyzed academic records to quantitatively examine the correlation between the implementation of AI tools and technologies and students' learning outcomes. This analysis focused on academic performance metrics such as grades, progression rates, and educational achievements.

3.5 Data Analysis Techniques

1. **Thematic Analysis**: Qualitative data from interviews and open-ended questions responses was thematically analyzed to identify recurring themes and patterns in participants' perceptions and experiences.
2. **Statistical Analysis**: Quantitative survey data and academic records underwent statistical analysis to examine relationships and trends between Generative AI adoption and academic performance. Descriptive statistics and inferential tests were employed as appropriate.

The combination of qualitative insights from interviews and quantitative data from surveys and academic records provided a comprehensive understanding of the role of Generative AI in academia within the Upper East region. This approach aimed to illuminate both the challenges and opportunities associated with AI integration in higher education, contributing to broader discussions on educational technology and pedagogical practices.

3.5.1 Mathematical formula for correlation analysis

The Pearson correlation coefficient r was used assess the relationship between the use of generative AI tools in academic performance. The Formula for the Pearson correlation is:

$$r = \frac{\sum(x_i - \bar{x})\,(y_i - \bar{y})}{\sqrt{\sum(x_i - \bar{x})^2 \sum(y_i - \bar{y})^2}}$$

Where:

- x and y are the individual sample points.
- $\bar{x}$ is the mean of the x values.
- $\bar{y}$ is the mean of the y values.
- Σ denotes the summation.

Interpretation of Pearson's Correlation Coefficient

- $r = 1$: Perfect positive linear relationship.
- $r = -1$: Perfect negative linear relationship.
- $r = 0$: No linear relationship.
- $0 < r < 1$: Positive linear relationship.
- $-1 < r < 0$: Negative linear relationship.

3.6 Tools

The study employed a variety of tools to facilitate data collection and analysis.

1. **Google Forms**: Used for designing and distributing questionnaires to both students and faculty members, and for collecting and organizing responses systematically.
2. **Python programming language**: Employed for data analysis and visualization tasks. Python's robust libraries such as Pandas, NumPy, and Matplotlib, enabled the processing of survey data, including cleaning, transforming, and analyzing both qualitative and quantitative responses. Python's flexibility allowed for customized analysis tailored to the study's specific research questions, ensuring thorough exploration of correlations, trends, and patterns within the collected data. By integrating Google Forms for data collection and Python for advanced analysis and visualization, the study aimed to leverage the strengths of both tools to derive meaningful insights and conclusions effectively [40, 41].

4. RESULTS AND DISCUSSION

This section presented the findings of our investigation into the impact of Generative Artificial Intelligence (AI) on academic integrity and learning outcomes in three selected universities within Ghana's Upper East Region: C. K. Tedam University of Technology and Applied Sciences, Bolgatanga Technical University, and Regentropfen University College. A purposive sampling technique was employed to recruit 150 participants (50 from each university) with experience using Generative AI tools, ensuring diverse representation across demographics. The participants included:

The results are organized into three key sections:

1. **Qualitative Findings:** Insights gleaned from interviews and open-ended question responses, revealing themes and patterns in participants' experiences and perspectives.
2. **Quantitative Findings:** Analysis of data from surveys and academic records, providing statistical evidence on Generative AI use and its potential relationship with learning outcomes.
3. **Integrated Discussion:** A combined analysis of both qualitative and quantitative findings, offering a comprehensive understanding of the multifaceted role Generative AI plays in the Upper East Region's higher education landscape.

This multi-faceted approach allows us to explore the nuances of Generative AI's impact, fostering a deeper understanding of its implications for academic integrity, learning practices, and educational policy in this specific educational context.

Table 2. Demographic Profile of Survey Participants

Demographic	Category	Percentage
Gender Distribution	Male	60%
	Female	40%
Age Range	18-24 years	45%
	25-34 years	35%
	35-44 years	15%
	45 years and above	5%
Academic Level	Undergraduate	70%
	Postgraduate	30%
Field of Study	Computer Science	30%
	Engineering	25%
	Business	20%
	Humanities and Social Sciences	15%
	Other	10%

Objective One (1): Analyze changes in student comprehension when using Generative AI tools for content generation, research assistance, and summarizing complex topics.

4.1 Results One (1)

4.1.1 Qualitative data: thematic analysis

1. A Computer Science student mentioned, "Generative AI tools like ChatGPT have significantly reduced the time I spend on initial research, allowing me to focus more on analysis and interpretation."
2. An engineering student stated, "AI tools help in generating multiple design iterations quickly, which is particularly useful in project-based learning."

4.1.2 Quantitative data: statistical analysis

Fig. 1. showed analysis of students' familiarity with a Generative AI study at three universities reveals that out of 150 students, 120 (80%) are very familiar, 20 (13.3%) are somewhat familiar, and 10 (6.7%) are not familiar with the study. This indicates a generally high level of familiarity, with most students demonstrating strong or moderate understanding.

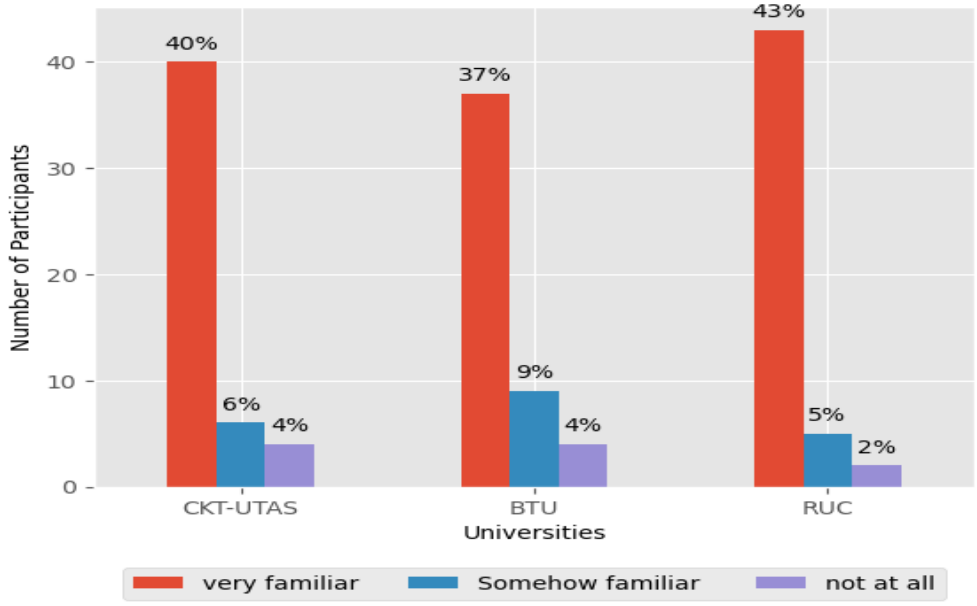

Fig. 1. Familiarity with the Concept of Generative AI

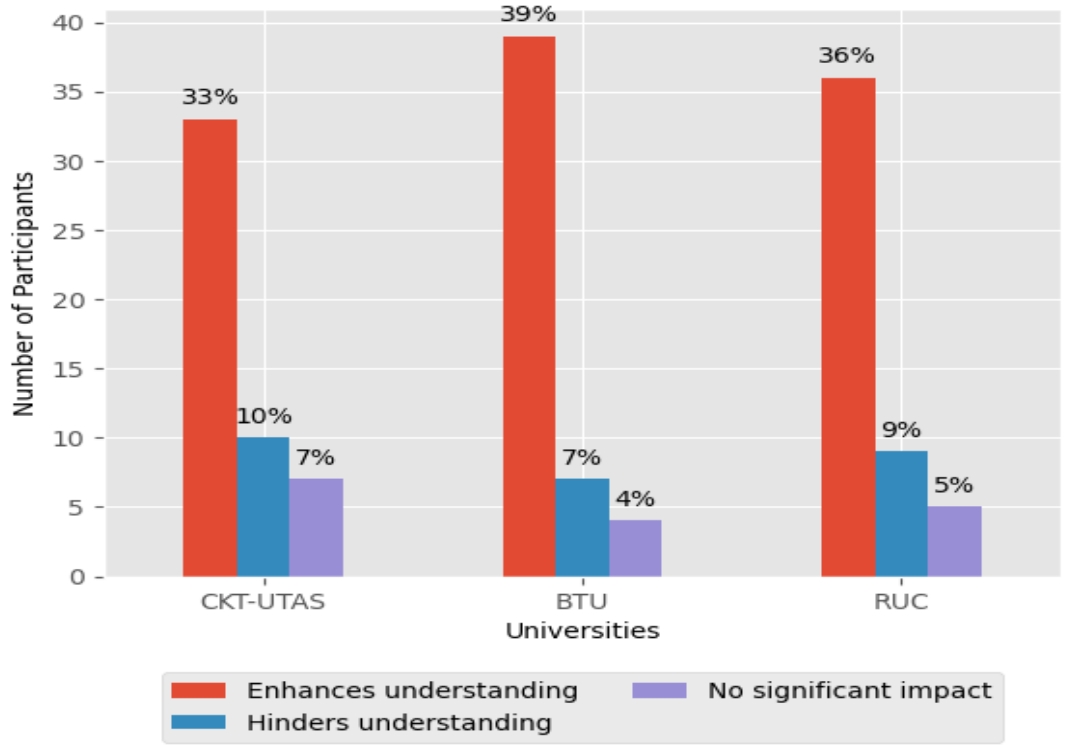

Fig. 2. Impact of Generative AI on Student Understanding

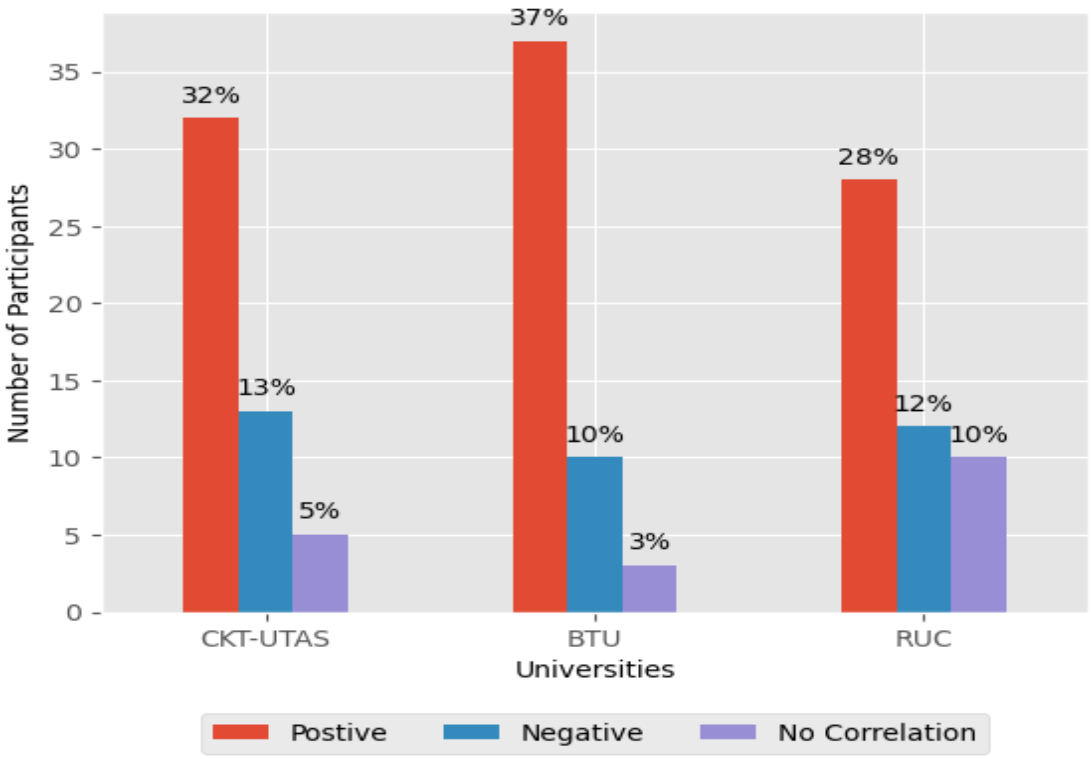

Fig. 3. Perceived Correlation between Generative AI Use and Academic Performance

Fig. 2 revealed that out of 150 students from three universities, 108 students (72%) reported an enhanced understanding, 26 students (17.3%) reported a hindered understanding, and 16 students (10.7%) reported no significant impact. This indicates an overall positive effect on comprehension, as the majority of students experienced an improvement in their understanding of the study material.

Fig. 3 showed different opinions on the impact of Generative AI on academic performance. Out of the participants, 97 (64.7%) believe it has a positive effect, 35 (23.3%) perceive a negative effect, and 18 (12%) report no significant impact. These findings suggest a majority in favour of a positive impact, while also noting dissenting and neutral perspectives.

4.2 Summary

1. **Integration of Findings:** The qualitative and quantitative data consistently highlighted the positive impact of Generative AI on learning efficiency and academic performance.
2. **Consistent Themes across Data Types:** Enhanced learning efficiency was a prominent theme across both qualitative and quantitative data.

Objective Two (2): Identify and evaluate academic integrity concerns associated with the use of Generative AI tools by students.

4.3 Results Two (2)

4.3.1 Qualitative data: thematic analysis

A faculty member stated, "There needs to be clear guidelines on how to use AI ethically to prevent academic dishonesty. Students might use AI to generate entire essays, which raises questions about originality and integrity."

4.3.2 Quantitative data: statistical analysis

Fig. 4 revealed key challenges in integrating Generative AI into the curriculum: 19 reported Technical Challenges, 34 cited Ethical Concerns, 75 highlighted Academic Integrity Issues, and 22 selected all of the above. These findings indicated significant hurdles, emphasizing the need for professional development, clear guidelines, and further research to ensure effective and responsible integration of Generative AI in education.

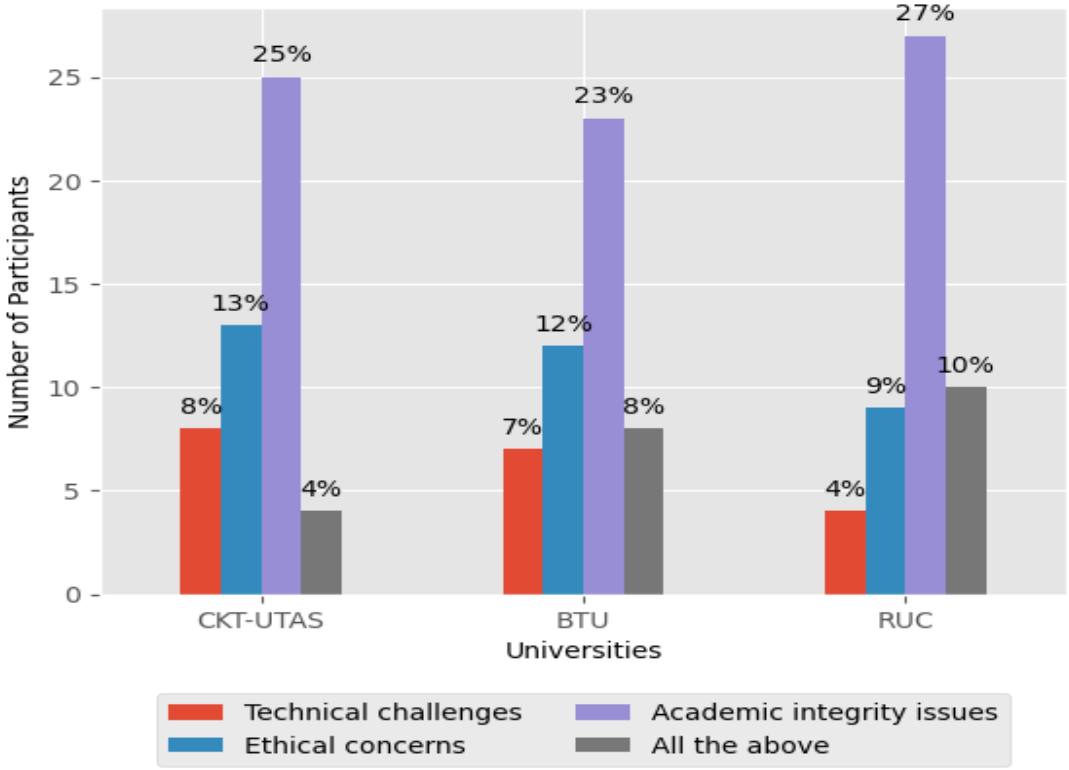

Fig. 4. Challenges in Integrating Generative AI into the Curriculum

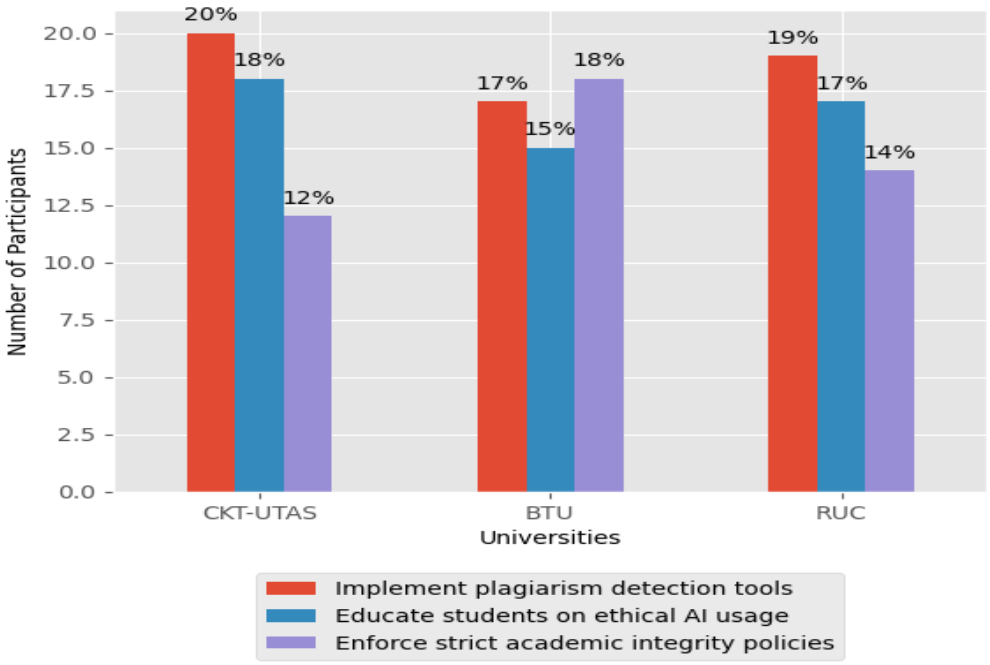

Fig. 5. Academic Integrity Concerns with Students' Use of Generative AI

Fig. 5 showed instructors' preferences for addressing academic dishonesty with Generative AI: 56 favoured plagiarism detection tools, 50 supported educating students on ethical AI usage, and 44 endorsed strict academic integrity policies. This highlights balanced concerns across strategies and a slight preference for detection tools, emphasizing the need for a comprehensive approach.

4.4 Summary

1. **Consistent Themes across Data Types:** The concern for academic integrity emerged as a consistent theme, with both students and faculty emphasizing the need for ethical use of Generative AI in educational settings.
2. **Integration of Findings:** Both groups acknowledged the need for ethical guidelines.

Objective Three (3): Quantitatively assess the correlation between Generative AI tool usage and improved student grades.

4.5 Results Three (3)

4.5.1 Quantitative data: statistical analysis

1. Students who frequently used Generative AI tools had an average GPA increase of 0.3 points compared to students who did not use;
2. The correlation coefficient calculated (r = 0.45). It means that our data analysis reveals a moderate positive relationship between AI usage and academic performance level.

4.6 Summary

1. **Impact on Learning Outcomes:** Quantitative data showed a positive relationship between Generative AI use and academic performance level.

Objective Four (4): Analyze the qualitative data telling about the issues of excessive use of Generative AI and its effect on critical thinking.

4.7 Results Four (4)

4.7.1 Qualitative data: thematic analysis

1. According to a student of Business department, "I know that although AI might be helpful in churning out contents quickly it can do nothing but make me lazy and dependent on technology.
2. Quoting a professor from the Humanities & Social Sciences department, "Although AI can create content but there is always fear

when students use such technologies they will miss ability to think critically.

4.8 Summary

1. **Impact on Learning Outcomes:** There was a few open questions about the potential negative impact (of course) and one of them says overusing AI maybe rob students some opportunities to develop critical thinking, or problem-solving skills
2. **Consistent Themes across Data Types**: Worry about AI overreliance and effects on critical thinking skills were themes consistent in the qualitative data.

Objective Five (5): Provide recommendations for integrating AI literacy programs, developing ethical guidelines, and implementing advanced plagiarism detection systems in educational institutions.

4.9 Results Five (5)

4.9.1 Quantitative data: statistical analysis

Across universities, faculty members have different priorities when it comes to addressing challenges in Generative AI (see Fig. 6). The majority of faculty, 56.7%, consider training on ethical AI usage as highly important. The next priority, at 24.7%, is developing clear guidelines, followed by fostering a culture of academic integrity, noted by 18.7%. These varying priorities illustrate the diverse strategies employed by universities in managing the impact of Generative AI on academic practices.

Fig. 7 illustrated the key measures necessary for responsibly integrating Generative AI in higher education. A majority (51%) emphasize the need for robust regulatory frameworks to guide ethical AI use, highlighting the priority of clear rules to manage AI complexities in education. Additionally, 23% stress the importance of sufficient funding for AI research and development to foster innovation and enhance learning. Promoting academia-industry collaboration is vital for 14% of respondents, bridging theoretical research and practical implementation. Finally, 12% advocate for regulating AI access to prevent over-reliance and maintain critical thinking skills. These measures collectively ensure responsible AI integration, maximizing benefits while mitigating risks.

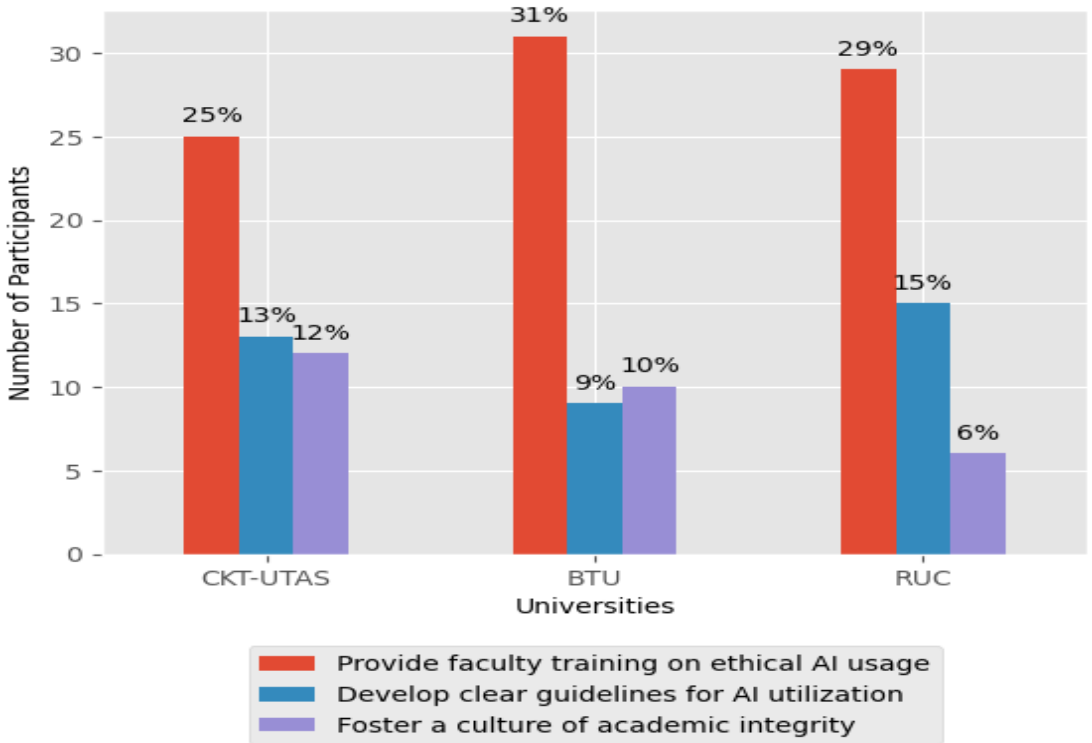

Fig. 6. Measures to Address Challenges of Generative AI Usage in Universities

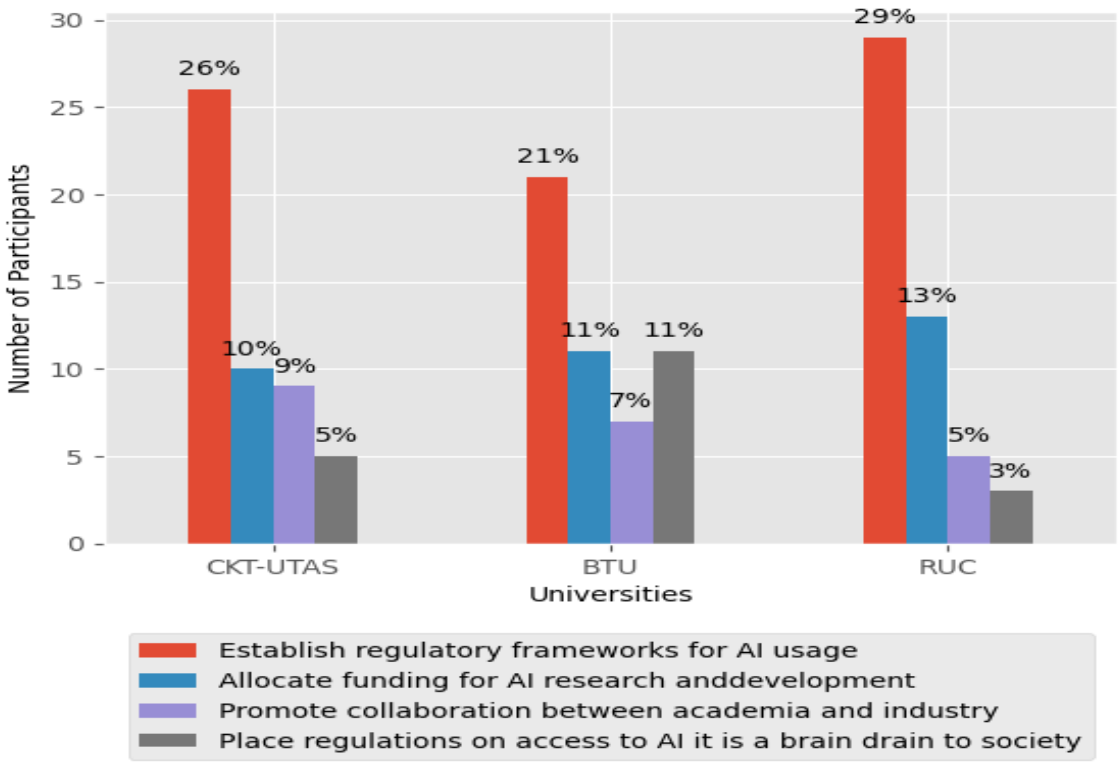

Fig. 7. Supporting Responsible Integration of Generative AI in Higher Education

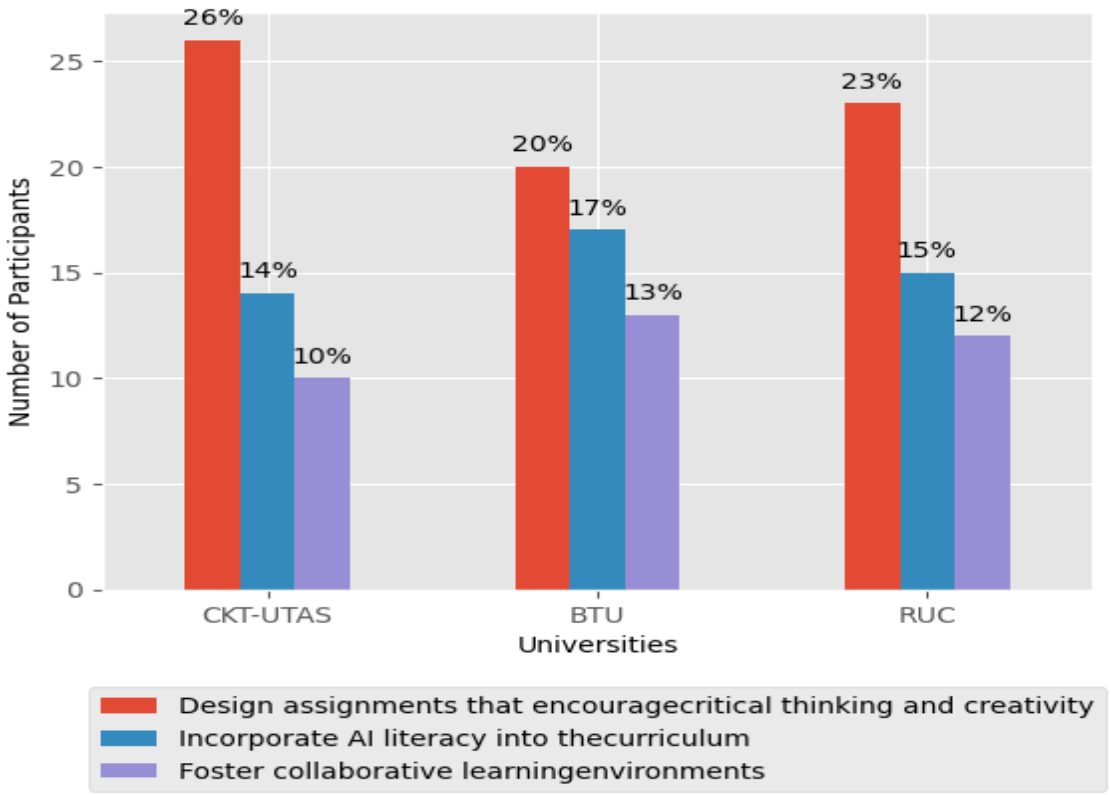

Fig. 8. Educator Strategies for Utilizing Generative AI

Fig. 8 showed the total endorsements across all universities for various strategies. These strategies include designing assignments that encourage critical thinking and creativity, which received 69 endorsements (69%), incorporating AI literacy into the curriculum with 46 endorsements (46%), and fostering collaborative learning environments with 35 endorsements (35%). This analysis highlights a strong preference for assignments that enhance critical thinking and creativity among the universities.

4.10 Summary

4.10.1 Broader Implications

1. Fig. 6, for instance, showed that 56.7% of educators think AI ethics training should be very important or extremely important.
2. Fig. 7 showed 51% of educators think the same for robust regulatory frameworks on AI ethics.
3. Fig. 8 captured 69% support from educators for the proposition to create assignments that require critical thinking and creativity.

4.10.2 Integration of Findings

1. When these findings are combined, the recommendations would be that AI literacy be integrated into the curriculum, emphasis be given to ethics in use of AI tools, and robust plagiarism detection systems be implemented.
2. Additionally, this would also require a balanced approach to develop both AI proficiency and critical thinking.

5. SUMMARY, CONCLUSION AND RECOMMENDATIONS

In this section, the research concluded by reporting our collective reflections on our investigation into AI generation, academic integrity and learning outcomes. Here the research draws the findings together, make interpretations and offer recommendations to support the ethical use of generative AI in education.

5.1 Summary

Thus, this study sought to understand how Generative Artificial Intelligence is implemented and its effects on educational effectiveness, academic integrity and academic performance for higher education or universities in the UER of Ghana. As a result, this research, aimed to answer the following: how Generative Artificial Intelligence influences effective instruction? What are the effects of Generative Artificial Intelligence on academic integrity? To what degree does Generative Artificial Intelligence affect academic performance? To achieve the objective of the study qualitative and quantitative methodology were used.

Key Findings:

1. Positive Impact on Learning and Performance: A majority of participants (64.7%) believe GenAI positively affects academic performance. Students who frequently use these tools show an average GPA increase of 0.3 points. This positive correlation is further supported by a correlation coefficient of 0.45. (It's important to note that correlation doesn't imply causation.) Briefly explaining how GenAI improves learning efficiency (e.g., faster research, personalized learning) would strengthen this point.
2. Academic Integrity Concerns: Significant challenges emerged, including technical issues, ethical concerns, and potential for plagiarism. There is a strong need for ethical guidelines and advanced plagiarism detection systems.
3. Strategies for AI Integration: Effective strategies include designing assignments that foster critical thinking and creativity, incorporating AI literacy programs into the curriculum (consider including details on program design, e.g., interactive workshops, practical exercises), and promoting collaborative learning environments.
4. Broader Implications: Faculty emphasize the necessity of robust regulatory frameworks and sufficient funding for AI research. Promoting academia-industry collaboration and regulating AI access are also critical considerations.

6. CONCLUSION

This research study disclosed that GenAI tools have the possible to improve finding out performance and enhance academic efficiency. Nevertheless, it is very important to acknowledge the threats they position to academic honesty. Both trainees plus professors identify the advantages of these tools, however

they highlight the demand for honest standards as well as well-balanced use to stop excessive dependence on GenAI and to make certain the growth of important assuming abilities. The favorable relationship discovered in between using GenAI as well as academic efficiency highlights the opportunity of boosting instructional results via accountable combination of these tools. It deserves keeping in mind that this research has particular constraints. The precision of the information might be influenced by prospective self-reporting predisposition in pupil studies. In addition, the evaluation of efficiency was based on short-term academic records, which might not fully capture the long-term impact of Generative AI on learning outcomes.

7. RECOMMENDATION

Based on the findings, the following suggestions are recommended to address the challenges and maximize the benefits of GenAI in higher education:

1. AI Literacy Programs: Incorporate thorough AI proficiency programs right into the educational program to enlighten trainees plus professor on the moral as well as reliable use AI devices. These programs need to cover AI capacities restrictions, prospective predispositions and honest factors to consider. (Expand on program layout, e.g., interactive workshops, functional workouts).
2. Honest Guidelines: Develop as well as execute clear moral standards for using GenAI in scholastic job. This consists of specifying appropriate usage as well as guaranteeing trainees recognize the significance of academic stability.
3. Plagiarism Detection Systems: Invest in innovative plagiarism discovery systems efficient in recognizing AI-generated web content to maintain academic stability.
4. Well-balanced AI Usage: Encourage a well-balanced strategy to AI use advertising these devices as help to finding out as opposed to substitutes for conventional research study approaches. This will certainly assist preserve together with boost important assuming together with analytical abilities.
5. Constant Monitoring: Establish boards to continuously keep track of the effect of AI on academic honesty along with finding out results adjusting plans as essential to attend to arising obstacles as well as chances.
6. Applying these suggestions will certainly assist academic establishments harness the benefits of GenAI while minimizing its dangers, guaranteeing that technical developments sustain instructional criteria coupled with pupil growth.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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