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CRITICAL THINKING AND SCHOLARLY INTEGRITY IN THE AGE OF ARTIFICIAL INTELLIGENCE

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Abstract

This study examined critical thinking and scholarly integrity in the age of artificial intelligence (AI) among university students in Lagos State, Nigeria. A descriptive survey research design was adopted. The population comprised undergraduate students from selected tertiary institutions, while a sample of 398 respondents was drawn from 420 distributed questionnaires using stratified and simple random sampling techniques. Data were collected using a structured questionnaire titled "Artificial Intelligence, Critical Thinking, and Scholarly Integrity Questionnaire (AICTSIQ)." The instrument was validated by experts and tested for reliability using Cronbach's Alpha, which yielded a coefficient of 0.82. Data were analyzed using descriptive statistics, including frequency counts, percentages, mean scores, and standard deviation. Findings revealed that AI moderately enhances students' critical thinking skills, particularly in reasoning, problem-solving, and analytical thinking. However, it also poses risks to scholarly integrity, including plagiarism, reduced originality, and ethical misuse of academic content. Respondents strongly agreed that AI increases academic efficiency but may weaken independent intellectual engagement if overused. The study further found strong support for strategies such as AI literacy education, ethical guidelines, and balanced integration of AI in academic work. The study concluded that AI has a dual influence on higher education by enhancing learning outcomes while simultaneously threatening academic integrity if not properly regulated. It recommended the promotion of responsible AI use, development of institutional ethical frameworks, and integration of AI literacy into curricula to ensure that students maintain critical thinking skills and uphold scholarly integrity in academic practice.

Keywords: Artificial Intelligence, Critical Thinking, Scholarly Integrity, Higher Education, Academic Ethics.

Introduction

The advent of Artificial Intelligence (AI) has significantly reshaped multiple sectors, including education, business, healthcare, and scientific research. AI tools have not only facilitated more

efficient data processing and decision-making processes but have also raised important questions about the future of critical thinking and scholarly integrity. As AI continues to evolve and permeate academic environments, increasing reliance on AI-generated content, research tools, and automated reasoning systems challenges traditional paradigms of knowledge creation, validation, and ethical scholarship. This development necessitates a reassessment of the foundational principles that underpin academic practice.

Scholarly integrity remains a fundamental pillar in science, research, and education, as it ensures the credibility, reliability, and ethical grounding of academic work. Any compromise in scholarly integrity can undermine scientific findings, innovation, and academic achievements. Consequently, maintaining high standards of integrity has always been a priority for researchers, scholars, and academic institutions. However, the rapid advancement of AI technologies, including tools such as ChatGPT and GitHub Copilot, has introduced new risks, particularly when such tools are misused in academic or research contexts. These developments raise concerns about the potential substitution of original human creativity with machine-generated outputs and the possible decline in independent analytical thinking.

Critical thinking, defined as the ability to analyze, evaluate, and synthesize information objectively, has long been regarded as central to scholarly work. In an academic landscape that has, in recent years, been shaped by AI technologies, safeguarding the authenticity and originality of intellectual output has become increasingly important. As students and researchers engage with AI systems, questions arise regarding whether these tools enhance or diminish critical thinking and academic standards. The integration of AI into research practices—from data analysis and writing assistance to advanced content generation—continues to transform how knowledge is produced, disseminated, and consumed, while simultaneously introducing ethical and intellectual challenges (Brynjolfsson & McAfee, 2014).

Although AI systems can efficiently process large datasets, identify patterns, and generate insights, they lack human capacities such as contextual judgment, creativity, and ethical reasoning. This limitation raises concerns about overreliance on AI tools, which may weaken critical thinking skills among scholars (Guszcza et al., 2017). Furthermore, scholarly integrity is increasingly at risk as AI enables sophisticated text generation, automated referencing, and content reproduction. The potential misuse of these technologies for plagiarism or manipulation of research outputs has intensified debates on how academic institutions can preserve the credibility and authenticity of scholarly work (Binns, 2020).

Despite the growing presence of AI in academia, its implications for critical thinking and scholarly integrity remain insufficiently explored. The central problem addressed in this study is how to integrate AI into academic practices without undermining intellectual rigor and ethical standards.

Accordingly, this study aims to examine the impact of AI on critical thinking and scholarly integrity within academic contexts. The objectives are to: (1) evaluate the influence of AI tools on critical thinking skills; (2) assess the risks posed to scholarly integrity; and (3) propose strategies for the responsible and ethical use of AI in academia. AI presents both opportunities and challenges. On one hand, it offers significant potential to enhance education and research, leading to innovation and technological advancement. On the other hand, its misuse may contribute to academic dishonesty and weaken the quality of scholarly output, potentially resulting in a decline in innovation and broader scientific and economic development.

Research Problem

The rapid integration of artificial intelligence (AI) into higher education has transformed teaching, learning, and research practices across global academic institutions. While AI tools such as automated writing assistants, data analysis systems, and generative language models have improved efficiency and accessibility to information, their widespread adoption has raised significant concerns regarding critical thinking and scholarly integrity. The central problem is that students and researchers increasingly rely on AI-generated outputs without sufficient evaluation, interpretation, or independent intellectual engagement. This growing dependence risks weakening essential academic competencies such as analysis, synthesis, and evaluation, which are fundamental to higher education. Furthermore, the ease of generating content through AI tools has increased instances of academic misconduct, including plagiarism, inappropriate paraphrasing, and misrepresentation of authorship. Although AI has the potential to support academic work, its misuse threatens the credibility, originality, and ethical standards of scholarly output. Institutions are therefore faced with the challenge of balancing technological advancement with the preservation of intellectual rigor and academic honesty. Despite existing discussions on AI in education, there remains a gap in understanding how AI specifically influences students' critical thinking abilities and adherence to scholarly integrity standards within higher education contexts. This study addresses this gap by examining the implications of AI use on academic thinking processes and ethical research practices, with the aim of promoting responsible and balanced integration of AI in academic environments.

Objectives of the Study

1. To examine the impact of artificial intelligence on students' critical thinking skills in higher education.
2. To assess the influence of AI tools on scholarly integrity and academic honesty.
3. To propose strategies for the responsible and ethical use of AI in academic environments.

Research Questions

1. How does artificial intelligence influence students' critical thinking skills in higher education?
2. In what ways does AI affect scholarly integrity and academic honesty?
3. What strategies can be adopted to ensure the responsible use of AI in academia?

Literature Review

Overview of Critical Thinking in Higher Education

Critical thinking skills have gained increasing prominence as essential competencies for 21st-century graduates (Alfonsi et al., 2017; Nakirijja et al., 2020). The integration of critical thinking into educational processes is now widely regarded as a priority, as higher education institutions seek to ensure that graduates possess the analytical and evaluative abilities required in modern professional environments. Consequently, institutions are increasingly concerned with understanding the meaning of critical thinking, its historical and theoretical foundations in education, and how it can be effectively implemented in higher learning contexts.

Critical thinking is defined in various ways depending on the theoretical perspective adopted. From a philosophical standpoint, Ennis (1985) describes it as reflective thinking that enables individuals to apply clear and logical reasoning from problem identification through to evidence-based conclusions. From a psychological perspective, Sternberg (1986) defines critical thinking as the mental processes, strategies, and representations individuals use to solve problems, make decisions, and acquire new knowledge. Educational theorists such as Bloom (1956) associate critical thinking with higher-order cognitive skills. Similarly, Fisher and Scriven define it as an academic competency comparable to reading and writing, involving the skilled and active interpretation and evaluation of observations, communications, information, and argumentation (Fisher & Scriven, 1997). This educational perspective provides a relevant foundation for understanding critical thinking within higher education.

Critical thinking has long been regarded as essential for academic success and intellectual development. It encompasses the ability to analyze, evaluate, and synthesize information, question assumptions, and consider alternative perspectives (Facione, 2015). According to Paul and Elder (2014), it includes key cognitive skills such as reasoning, problem-solving, and decision-making, all of which are fundamental to effective scholarship. As such, critical thinking enables individuals to engage with complex ideas, identify gaps in knowledge, and construct well-reasoned arguments. The development of critical thinking is central to higher education curricula, with institutions emphasizing its importance across disciplines. However, the increasing adoption of AI technologies in academia presents both opportunities and challenges. AI tools, including automated writing assistants and research synthesis systems, can enhance efficiency and improve

access to information. While these tools may support learning and academic writing, they also raise concerns about encouraging passive engagement rather than active analysis (Kuhn, 2015). Some scholars suggest that overreliance on AI may contribute to a decline in critical thinking skills among students and researchers. Tools that automatically generate summaries, recommend sources, or assist with writing may reduce the need for deep engagement with academic material. This could limit opportunities for independent analysis and critical evaluation of information (Carr, 2014). Furthermore, there is concern that reliance on AI-generated outputs may discourage users from questioning the accuracy and validity of such content, thereby weakening essential cognitive skills (Harari, 2018).

Impact of Artificial Intelligence on Scholarly Integrity

Scholarly integrity refers to adherence to established ethical standards in academic work, ensuring that research is conducted with honesty, originality, and transparency (Steneck, 2006). The growing use of artificial intelligence (AI) in writing, research assistance, and data analysis has raised important questions about its implications for maintaining these standards. One major concern is the potential for AI to facilitate academic dishonesty, including plagiarism and data manipulation. AI-driven writing tools such as Grammarly and GPT-3 can generate or paraphrase text, which may be misused by students and researchers if not properly monitored (Binns, 2020). At the same time, AI-based plagiarism detection systems have become increasingly advanced, prompting debate over whether reliance on such technologies may shift academic practice toward excessive monitoring rather than fostering genuine intellectual responsibility (Bretag, 2016).

AI technologies are now widely integrated into everyday life and academic environments, driven by advances in digital infrastructure and computational capabilities. Educational institutions and research organisations have increasingly adopted AI to enhance efficiency in tasks such as data analysis, administrative processes, and literature review (Alam, 2021; Gendron et al., 2022). These tools offer significant opportunities to improve productivity and support research activities. However, their integration also necessitates greater attention to transparency, accountability, and ethical use. For example, AI systems like ChatGPT have demonstrated the capacity to assist in generating ideas and analysing large datasets, thereby expanding research possibilities (Thomas et al., 2023). Ensuring proper attribution and clearly acknowledging AI-assisted contributions are essential for maintaining the authenticity of scholarly work. Studies suggest that AI can enhance innovation when applied within rigorous methodological frameworks and ethical guidelines (Pigola et al., 2023). Similarly, Veen et al. (2015) argue that AI has become a transformative force in academic research. In some instances, AI systems have even been credited as co-authors, reflecting ongoing debates about authorship and intellectual contribution (Kakatkar et al., 2020; Hajkowicz et al., 2023).

AI tools that automatically generate citations and references also raise concerns regarding source credibility. Users may rely on AI-generated references without verifying their accuracy or relevance, potentially compromising the quality of academic work (Binns, 2020). Additionally, presenting AI-generated content without proper attribution poses significant risks to scholarly integrity. Conversely, AI can also support academic honesty through tools designed to verify originality, validate data, and ensure compliance with ethical standards. For instance, AI-powered plagiarism detection systems play an important role in identifying improperly attributed material and maintaining academic standards (Bailey et al., 2019). Despite these benefits, broader ethical concerns about AI's role in scholarship remain unresolved.

Artificial intelligence is broadly defined as an interdisciplinary field of computer science focused on developing systems capable of performing tasks that typically require human intelligence, including learning, reasoning, problem-solving, and decision-making (Tyagi et al., 2020; Tzenios, 2020). These systems rely on advanced algorithms and large datasets to simulate aspects of human cognition, enabling them to analyse information, adapt to new inputs, and perform tasks autonomously (Villegas-Ch et al., 2020; Zhai et al., 2021).

AI is widely applied across sectors such as transportation, healthcare, commerce, and education, and is increasingly viewed as a driver of innovation and competitiveness (Abadi et al., 2020). In academia, it has introduced new approaches to data analysis, literature review, and knowledge production. Techniques such as natural language processing (NLP) enable researchers to process complex information more efficiently, opening new avenues for inquiry. While these advancements improve research efficiency, they also underscore the importance of maintaining methodological rigour and ethical standards. If these considerations are adequately addressed, AI has the potential to transform established research paradigms and contribute positively to academic development (Pigola et al., 2023).

Ethical Considerations in the Use of AI for Research and Writing

The use of artificial intelligence (AI) in academic research and writing presents several ethical challenges, including concerns related to algorithmic bias, data privacy, and the need for transparent and accountable systems. Addressing these issues is essential to ensure that the benefits of AI are realized without causing unintended harm to individuals or society. Garbuio and Lin (2021) emphasize that further empirical research is required to better understand the ethical implications of AI in academic contexts. Effective use of AI demands not only technical expertise but also the ability to interpret, explain, and justify the decisions generated by AI systems, thereby ensuring transparency and accountability.

Ensuring data security and ethical compliance remains a critical concern. Sun and Dong (2018) argue that AI systems must be designed to protect data integrity, safeguard user privacy, and

employ appropriate technologies suited to specific research tasks. While AI can enhance research efficiency, its increasing complexity introduces challenges in understanding and evaluating its outputs. Elaiess (2023) highlights risks such as data manipulation and the generation of inaccurate results, while also noting the potential misuse of AI to bypass established research ethics. For example, the automation of tasks traditionally requiring human judgment—such as editing or peer review—raises concerns about the erosion of accountability in scholarly processes. Consequently, the intersection between AI and research ethics represents a growing area of concern, particularly when ethical considerations are not adequately addressed prior to AI deployment (Thomas et al., 2023).

The ethical use of AI also requires careful attention to bias and fairness. As noted by Cathy O'Neil (2016), AI systems can reproduce and amplify biases embedded in their training data, leading to skewed or inequitable outcomes. In academic research, this may affect the objectivity of AI-assisted tools, such as literature review systems that may privilege certain authors, disciplines, or perspectives, thereby limiting diversity in scholarly discourse. Another significant challenge is the lack of transparency in many AI systems, often described as "black boxes." Frank Pasquale (2015) argues that limited visibility into algorithmic processes raises concerns about trust and accountability. In response, scholars such as Luciano Floridi (2018) advocate for a data ethics framework that prioritizes transparency, fairness, and accountability. Such approaches support the development of guidelines to ensure that AI applications align with the principles of scholarly integrity.

Looking ahead, AI is expected to play an increasingly prominent role in academia, shaping both knowledge production and educational practices. Schmidt (2021) suggests that AI can enhance learning through personalized instruction, real-time feedback, and improved access to academic resources. While these developments may support the cultivation of critical thinking, they also underscore the need to preserve intellectual independence and ethical standards. To achieve this balance, academic institutions must adopt proactive strategies, including integrating AI literacy into curricula, providing training on ethical AI use, and establishing clear policies for responsible AI application in research and writing (Popenici & Kerr, 2017).

Research Methodology

The study adopted a descriptive survey research design to examine the impact of artificial intelligence on critical thinking and scholarly integrity among university students. It was conducted in Lagos State, Nigeria, a major educational and technological hub in West Africa characterized by a tropical climate with distinct wet and dry seasons, a highly urbanized environment, and a diverse mix of residential, commercial, and industrial terrain. The state shares boundaries with Ogun State and the Atlantic Ocean and serves as a strategic economic center driven by education, technology, commerce, and services. The study focused on selected tertiary

institutions, including the University of Lagos, Lagos State University, and other higher institutions, which provided a suitable context for investigating AI usage in academic settings. The population comprised undergraduate students drawn from these institutions, identified through official academic records and departmental listings across faculties such as Arts, Sciences, Education, and Social Sciences, ensuring adequate representation of diverse academic disciplines. A total of 420 respondents were selected using a multi-stage sampling technique in which three institutions were purposively chosen based on accessibility and ICT integration, followed by stratified sampling of students by faculty, and simple random sampling within each stratum. The sample size was determined using the Yamane statistical formula for finite populations. Data were collected using a structured questionnaire titled "Artificial Intelligence, Critical Thinking, and Scholarly Integrity Questionnaire (AICTSIQ)," which contained closed-ended and Likert-scale items designed to measure AI usage, critical thinking engagement, and scholarly integrity practices. The instrument was validated by experts in research methodology and measurement for clarity and relevance, while reliability was confirmed using Cronbach's Alpha, yielding a coefficient of 0.82. Data collection was carried out through both online distribution via Google Forms and physical administration of questionnaires with the assistance of trained research assistants. Out of 420 questionnaires distributed, 398 were properly completed and returned, and data were collected over three weeks. The collected data were analyzed using descriptive statistical methods such as frequency counts, percentages, and mean scores.

Data Analysis

Research question 1: How does artificial intelligence influence students' critical thinking skills in higher education? In order to answer the research question, descriptive analysis was performed on the data collected (Table 1).

Table 1: AI Influence on Students' Critical Thinking Skills

Item Statements	SA	A	D	SD	Mean	SD
AI improves students' reasoning ability	120 (30.15%)	160 (40.20%)	70 (17.59%)	48 (12.06%)	2.88	0.96
AI enhances problem-solving skills	110 (27.64%)	170 (42.71%)	65 (16.33%)	53 (13.32%)	2.85	0.98
AI supports analytical thinking	130 (32.66%)	150 (37.69%)	60 (15.08%)	58 (14.57%)	2.89	0.97
AI encourages independent learning	105 (26.38%)	165 (41.46%)	80 (20.10%)	48 (12.06%)	2.82	0.95

Item Statements	SA	A	D	SD	Mean	SD
AI improves evaluation of information	115 (28.89%)	155 (38.94%)	75 (18.84%)	53 (13.32%)	2.86	0.97

Aggregate: SA = 580, A = 800, D = 350, SD = 260
Proportional Ratio: SA 29.15%, A 40.20%, D 17.59%, SD 13.07%
Overall Mean = 2.86, SD = 0.97

Table 1 shows that respondents generally agreed that AI influences students' critical thinking skills positively. The highest response category was Agree (40.20%), followed by Strongly Agree (29.15%), indicating a favourable perception. Disagreement levels were relatively low, with Disagree at 17.59% and Strongly Disagree at 13.07%. Item analysis revealed that AI enhances reasoning ability (160, 40.20%) and analytical thinking (150, 37.69%) were most supported. The overall mean score of 2.86 confirms moderate agreement, while the standard deviation of 0.97 shows minimal variation in responses. This suggests that AI is widely perceived as enhancing critical thinking among students.

Research question 2: In what ways does AI affect scholarly integrity and academic honesty? In order to answer the research question, descriptive analysis was performed on the data collected (Table 2).

Table 2: AI and Scholarly Integrity

Item Statements	SA	A	D	SD	Mean	SD
AI increases the risk of plagiarism	140 (35.18%)	150 (37.69%)	60 (15.08%)	48 (12.06%)	2.96	0.95
AI affects originality of academic work	125 (31.41%)	165 (41.46%)	70 (17.59%)	38 (9.55%)	2.95	0.94
AI may distort research authenticity	135 (33.92%)	155 (38.94%)	55 (13.82%)	53 (13.32%)	2.91	0.98
AI reduces academic honesty	118 (29.65%)	172 (43.22%)	65 (16.33%)	43 (10.80%)	2.92	0.93
AI can lead to unethical writing practices	128 (32.16%)	158 (39.70%)	62 (15.58%)	50 (12.56%)	2.90	0.96

Aggregate: SA = 646, A = 800, D = 312, SD = 232
Proportional Ratio: SA 32.46%, A 40.20%, D 15.68%, SD 11.66%
Overall Mean = 2.93, SD = 0.95

Table 2 indicates that respondents agreed that artificial intelligence has significant implications for scholarly integrity. The highest proportion of responses was Agree (40.20%), followed by Strongly Agree (32.46%), showing strong concern about ethical issues. Disagreement responses were lower, with Disagree at 15.68% and Strongly Disagree at 11.66%. The most supported item was that AI increases risk of plagiarism (150, 37.69%), while reduced academic honesty also recorded high agreement (172, 43.22%). The overall mean of 2.93 suggests moderate to high agreement, and the standard deviation of 0.95 indicates consistency in respondents' perceptions across ethical concerns.

Research question 3: What strategies can be adopted to ensure the responsible use of AI in academia? In order to answer the research question, descriptive analysis was performed on the data collected (Table 3).

Table 3: Strategies for Responsible AI Use in Academia

Item Statements	SA	A	D	SD	Mean	SD
AI literacy should be taught in schools	150 (37.69%)	160 (40.20%)	50 (12.56%)	38 (9.55%)	3.06	0.92
Ethical guidelines for AI use are necessary	140 (35.18%)	170 (42.71%)	55 (13.82%)	33 (8.29%)	3.05	0.91
AI should support, not replace, human thinking	145 (36.43%)	165 (41.46%)	60 (15.08%)	28 (7.04%)	3.07	0.90
Students need training on AI ethics	155 (38.94%)	150 (37.69%)	58 (14.57%)	35 (8.79%)	3.06	0.93
Academic honesty must guide AI use	148 (37.19%)	162 (40.70%)	52 (13.07%)	36 (9.05%)	3.06	0.92

Aggregate: SA = 738, A = 807, D = 275, SD = 170
Proportional Ratio: SA 37.09%, A 40.55%, D 13.82%, SD 8.54%
Overall Mean = 3.06, SD = 0.92

Table 3 reveals strong agreement on strategies for ensuring responsible AI use in academia. Agree (40.55%) was the dominant response, followed by Strongly Agree (37.09%), indicating strong support for ethical AI integration. Disagreement levels were low, with Disagree at 13.82% and Strongly Disagree at 8.54%. The most supported strategy was that AI should support rather than replace human thinking (165, 41.46%), while AI literacy training also received high endorsement. The overall mean of 3.06 shows strong agreement, and the standard deviation of 0.92 indicates closely aligned responses, reflecting consensus on ethical and educational strategies for AI use.

Discussion of Findings

The findings of this study reveal significant insights into the impact of artificial intelligence (AI) on critical thinking and scholarly integrity in higher education. The results from Table 1 indicate that respondents generally agree that AI enhances students' critical thinking skills. This aligns with Chen et al. (2020), who argue that AI applications in education can improve cognitive engagement by supporting learning processes such as analysis and information synthesis. Similarly, Lee et al. (2022) found that AI-based learning systems positively influence students' self-efficacy and motivation, which indirectly strengthen critical thinking abilities. The present study supports this view, as the majority of respondents agreed that AI improves reasoning, analytical thinking, and problem-solving skills. However, the moderate mean score suggests that while AI contributes positively, its impact is not absolute and still depends on how it is used in academic settings. The findings also correspond with Guszcza et al. (2017), who emphasized that human-AI collaboration can enhance cognitive performance when properly balanced. This suggests that AI should function as a supportive tool rather than a replacement for human reasoning. However, Carr (2010) warns that overreliance on digital technologies may weaken deep cognitive processing, which is essential for critical thinking. This concern is reflected in the present findings, where a portion of respondents indicated that AI may reduce independent learning if not properly regulated.

Regarding scholarly integrity, the findings in Table 2 show that respondents perceive AI as both beneficial and risky. A majority agreed that AI increases the risk of plagiarism, affects originality, and may distort research authenticity. This aligns with Bretag and Mahmud (2009), who highlighted the challenges of electronic plagiarism detection and the complexity of maintaining academic honesty in digital environments. Similarly, Gendron et al. (2022) caution that AI in academic publishing may undermine transparency and ethical standards if not properly controlled. O'Neil (2016) further supports these concerns by arguing that algorithmic systems can reinforce bias and inequality, which may extend into academic research outputs. The present study confirms this risk, as respondents expressed concerns about AI-generated content affecting academic honesty. Additionally, Elaiess (2023) notes that while AI enhances academic productivity, it also introduces risks of data manipulation and unethical academic practices. These findings suggest that scholarly integrity is increasingly vulnerable in environments where AI tools are widely used without strict ethical oversight. However, the study also reveals that AI can support academic integrity when used responsibly. This is consistent with Popenici and Kerr (2017), who argue that AI can improve teaching and learning when integrated ethically. Similarly, Pigola et al. (2023) emphasize that AI contributes positively to academic innovation when guided by methodological rigor and ethical frameworks.

In relation to strategies for responsible AI use (Table 3), respondents strongly supported AI literacy, ethical guidelines, and balanced usage of AI tools. This agrees with Kasneci et al. (2023), who highlight the importance of responsible integration of large language models such as ChatGPT in

education. Likewise, Alam (2021) emphasizes that AI in education should enhance rather than replace human instruction, ensuring that learners retain critical thinking abilities. Furthermore, Tyagi et al. (2020) and Villegas-Ch et al. (2020) argue that AI systems in smart learning environments must be designed to complement human intelligence. The present findings reinforce this position, showing strong agreement that AI should support—not replace—human cognitive processes. This also aligns with Paul and Elder (2007), who stress that critical thinking remains a foundational academic skill that must be preserved despite technological advancement.

Conclusion

The study investigated critical thinking and scholarly integrity in the age of artificial intelligence among university students in Lagos State, Nigeria. The findings revealed that artificial intelligence plays a significant role in shaping academic practices, particularly in enhancing students' cognitive abilities such as reasoning, analysis, and problem-solving. However, it also presents notable challenges, especially in relation to academic honesty and ethical scholarship. While AI tools contribute to improved learning efficiency and access to information, their misuse can undermine originality, promote plagiarism, and reduce independent intellectual effort among students. The study further established that scholarly integrity remains a critical foundation for academic excellence, yet it is increasingly threatened by the unregulated use of AI technologies. The ease of generating academic content through AI systems creates opportunities for academic misconduct, thereby weakening trust in scholarly outputs. At the same time, the findings indicate that when properly guided, AI can serve as a valuable academic support tool that enhances learning outcomes without compromising ethical standards. Hence, the study concludes that AI has a dual impact on higher education. It enhances critical thinking when used appropriately, but poses risks to scholarly integrity when misused or over-relied upon. Therefore, maintaining a balance between technological advancement and academic responsibility is essential. Institutions must ensure that students develop the ability to critically evaluate AI-generated content while upholding ethical academic practices. The sustainability of academic integrity in the digital age depends on how effectively educational stakeholders manage the integration of artificial intelligence into teaching, learning, and research processes.

Recommendations

Based on the findings of this study, the following recommendations are proposed:

1. To university management: Institutions should integrate compulsory AI literacy courses into undergraduate curricula to equip students with the skills needed to use AI responsibly and critically.

2. To academic staff and lecturers: Educators should redesign assessment methods to emphasize critical thinking and reduce overdependence on AI-generated submissions, ensuring originality in students' work.

3. To policymakers and educational authorities: Clear ethical guidelines and regulatory frameworks should be developed to govern the use of artificial intelligence in academic institutions and safeguard scholarly integrity.

4. To students and researchers: They should adopt a balanced approach to AI usage by using it as a supportive learning tool rather than a substitute for independent thinking and academic writing, while strictly adhering to ethical standards.

References

Abadi, H., He, Z., & Pecht, M. (2020). Artificial intelligence-related research funding by the U.S. National Science Foundation and the National Natural Science Foundation of China. *IEEE Access, 8*, 183448–183459. https://doi.org/10.1109/access.2020.3029231

Alam, A. (2021). Should robots replace teachers? Mobilization of AI and learning analytics in education. In *Proceedings of the International Conference on Advances in Computing, Communication, and Control (ICAC3)* (pp. 1–12). https://doi.org/10.1109/ICAC353642.2021.9697300

Bretag, T., & Mahmud, S. (2009). A model for determining student plagiarism: Electronic detection and academic judgement. *Journal of University Teaching & Learning Practice, 6*(1), 57–69.

Brynjolfsson, E., & McAfee, A. (2014). *The second machine age: Work, progress, and prosperity in a time of brilliant technologies*. W. W. Norton & Company.

Carr, N. (2010). *The shallows: What the Internet is doing to our brains*. W. W. Norton & Company.

Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. *IEEE Access, 8*, 75264–75278. https://doi.org/10.1109/access.2020.2988510

Elaiess, R. (2023). The impact of artificial intelligence on academics: A concise overview. *International Journal of Academic Multidisciplinary Research, 7*(4), 218–220.

Ennis, R. H. (1993). Critical thinking assessment. *Theory Into Practice, 32*(3), 179–186.

Facione, P. A. (1990). *Critical thinking: A statement of expert consensus for purposes of educational assessment and instruction*. American Philosophical Association.

Gendron, Y., Andrew, J., & Cooper, C. (2022). The perils of artificial intelligence in academic publishing. *Critical Perspectives on Accounting, 87*, 102373.

Guszcza, J., Lewis, H., & Evans-Greenwood, P. (2017). Cognitive collaboration: Why humans and computers think better together. *Deloitte Review*.

Haltsova, V. V., Kharytonov, S. O., Khramtsov, O. M., Zhytnyi, O. O., & Vasyliev, A. A. (2021). Criminal law as a means of protecting human rights and freedoms in the modern world. *Journal of the National Academy of Legal Sciences of Ukraine, 28*(3), 248–256.

Kasneci, E., Sessler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., Gasser, U., Groh, G., Günnemann, S., Hüllermeier, E., Krusche, S., Kutyniok, G., Michaeli, T., Nerdel, C., Pfeffer, J., Poquet, O., Sailer, M., Schmidt, A., Seidel, T., & Kasneci, G. (2023). ChatGPT for good? On opportunities and challenges of large language models for education. *Learning and Individual Differences, 103*, 102274.

Lee, Y. F., Hwang, G. J., & Chen, P. Y. (2022). Impacts of an AI-based chatbot on college students' after-class review, academic performance, self-efficacy, learning attitude, and motivation. *Educational Technology Research and Development, 70*(5), 1843–1865. https://doi.org/10.1007/s11423-022-10142-8

Newell, G. E., Beach, R., Smith, J., VanDerHeide, J., Kuhn, D., & Andriessen, J. (2011). Teaching and learning argumentative reading and writing: A review of research. *Reading Research Quarterly, 46*(3), 273–304.

O'Neil, C. (2016). *Weapons of math destruction: How big data increases inequality and threatens democracy*. Broadway Books.

Paul, R., & Elder, L. (2007). *A guide for educators to critical thinking competency standards*. Foundation for Critical Thinking.

Pigola, A., Scafuto, I., Costa, P., & Nassif, V. (2023). Artificial intelligence in academic research. *International Journal of Innovation, 11*(3), 1–9. https://doi.org/10.5585/2023.25408

Popenici, S. A., & Kerr, S. (2017). Exploring the impact of artificial intelligence on teaching and learning in higher education. *Research and Practice in Technology Enhanced Learning, 12*(1), 1–13. https://doi.org/10.1186/s41039-017-0062-8

Tyagi, A. K., Fernandez, T. F., Mishra, S., & Kumari, S. (2020). Intelligent automation systems at the core of Industry 4.0. In *Proceedings of the International Conference on Intelligent Systems Design and Applications* (pp. 1–18). Springer.

Villegas-Ch, W., Arias-Navarrete, A., & Palacios-Pacheco, X. (2020). Proposal of an architecture for the integration of a chatbot with artificial intelligence in a smart campus for the improvement of learning. *Sustainability, 12*(4), 1500. https://doi.org/10.3390/su12041500