

An Examination of Artificial Intelligence Strategies and their Effects on Research Quality Among Students in Tertiary Institutions in Cross River State, Nigeria

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Abstract

The advent of Artificial Intelligence (AI) has transformed teaching, learning, and research in tertiary institutions worldwide. This study examined Artificial Intelligence Strategies and Their Effects on Research Quality Among Students in Tertiary Institutions in Cross River State, Nigeria. The study focused on the extent of use of AI strategies by students, the effects of AI on research quality and originality, factors militating against AI use, and strategies for enhancing effective and ethical AI use in research. The study revealed that students increasingly use AI tools such as ChatGPT, Grammarly, QuillBot, Elicit, Consensus, Zotero, and SPSS AI for topic selection, literature review, data analysis, academic writing, and referencing. When used appropriately, AI improves the accuracy, depth, reliability, validity, and overall academic standard of research outputs. AI also enhances idea generation and creativity. However, over-reliance on AI and

direct submission of AI-generated content pose threats to originality, critical thinking, and academic integrity. The study further identified poor digital literacy, limited internet access and ICT infrastructure, lack of training, cost of AI subscriptions, ethical concerns, and absence of institutional policies as major factors limiting the effective use of AI in Cross River State. To address these challenges, the study recommends AI literacy training, policy development, effective supervision, integration of AI literacy into the curriculum, and improvement of ICT infrastructure. It was concluded that AI has a dual effect on research: it can significantly enhance research quality and efficiency, but it can also undermine originality if not properly regulated. With proper training, policy, and infrastructure, AI can serve as a powerful support tool for improving the quality and originality of students' research in tertiary institutions.

Keywords: Artificial Intelligence, Research Quality, Originality.

Study Background

The advent of Artificial Intelligence (AI) has significantly transformed the landscape of teaching, learning, and research in tertiary institutions worldwide. AI refers to the simulation of human intelligence processes by machines, particularly computer systems, to perform tasks such as problem-solving, decision-making, language processing, and data analysis [1]. In education, AI strategies include tools such as ChatGPT, Grammarly, QuillBot, Turnitin AI, research databases with AI search engines, and statistical software with machine learning capabilities. These tools are increasingly being adopted by teachers and students to support academic activities, especially research.

In recent years, the pressure to produce high-quality and original research has intensified in Nigerian tertiary institutions. Universities and colleges are expected to contribute meaningfully to knowledge generation, innovation, and national development through research [2]. However, many teachers and students face challenges such as limited access to current literature, poor research methodology skills, time constraints, and difficulty in maintaining originality. It is within this context that AI strategies are being positioned as potential solutions to improve the efficiency and quality of academic research. Globally, studies have shown that AI tools enhance research quality by improving access to information, automating literature review processes, and supporting data analysis [3,4]. For instance, AI-powered databases can scan thousands of journals

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within minutes and identify relevant studies, while AI writing assistants help improve clarity, coherence, and grammar in academic writing. This has made research production faster and more structured, especially for postgraduate students and early-career academics who may lack extensive research experience.

Despite these benefits, the integration of AI in research also raises concerns about originality and academic integrity. Several scholars argue that over-reliance on AI tools such as generative AI can lead to a decline in critical thinking, idea generation, and authentic authorship [5]. In many tertiary institutions, there have been reported cases of students submitting AI-generated essays and research proposals without a proper understanding of the content. This trend threatens the core academic value of originality and raises questions about the true competence of graduates and researchers. In Nigeria, the adoption of AI in education is still at an emerging stage. While some federal and private universities have begun incorporating AI tools into teaching and research, many state-owned institutions, including those in Cross River State, still grapple with infrastructural and digital literacy challenges [6]. Internet instability, lack of training, and limited access to licensed AI software are some of the barriers preventing optimal use of AI strategies among teachers and students. Consequently, the potential of AI to improve research quality and originality remains largely underexplored in this context.

Recent studies in Nigeria suggest that teachers and students are becoming more aware of AI tools, particularly free versions of ChatGPT and Grammarly, for drafting research papers and checking grammar

[7]. However, there is limited empirical evidence on how the use of these AI strategies specifically affects the quality and originality of research outputs in Nigerian tertiary institutions. This gap is more pronounced in Cross River State, where research on AI adoption in academia is scarce despite the growing use of digital tools among students.

The importance of research quality in relation to originality cannot be overstated in tertiary education. Quality research forms the foundation upon which academic reputation, institutional ranking, and national development are built. In the university system, research is expected to meet certain standards: it must be valid, reliable, methodologically sound, well-structured, and most importantly, it must contribute new knowledge to existing literature [8]. A research work that lacks these attributes, no matter how lengthy, cannot be said to be of acceptable academic standard. Originality is a critical component of research quality. It refers to the ability of a researcher to generate new ideas, perspectives, or findings that have not been previously reported. Original research demonstrates independent thinking, creativity, and intellectual contribution [4]. It also ensures that academic work is authentic and free from plagiarism. In Nigerian tertiary institutions, originality has become a major concern because of rising cases of copy-paste writing, recycling of old topics, and over-dependence on secondary sources. This challenge is now compounded by the emergence of AI tools.

Artificial Intelligence, when used effectively and ethically, has the potential to enhance both the quality and originality of research. AI-powered tools can help researchers to synthesise large volumes of literature

within a short time, identify research gaps, and develop coherent arguments [3]. Tools like ChatGPT, Elicit, and Consensus can assist in paraphrasing, improving academic language, and organising ideas logically. AI-based statistical software can also improve the accuracy and reliability of data analysis, which directly improves research quality. However, the same AI tools pose a threat to originality if not properly guided. Without adequate training and institutional policies, students and even teachers may become over-reliant on AI to generate entire research proposals, literature reviews, or discussion sections [5]. This reduces the depth of scholarly engagement and critical thinking because the researcher may not fully understand or own the ideas being presented. In such cases, AI becomes a shortcut that promotes superficial learning and increases the risk of plagiarism, even if the text is “AI-paraphrased.”

Therefore, the relationship between AI, research quality, and originality is two-sided. On one hand, AI can be a powerful strategy for improving the standard of research in Cross River State tertiary institutions by making the process faster, more accurate, and more comprehensive. On the other hand, if AI is misused, it can undermine the authenticity of academic work and defeat the purpose of research as a means of knowledge creation [7]. Given this dual effect, it is important to examine how students in tertiary institutions in Cross River State are currently using AI strategies and to what extent this usage is influencing the quality and originality of their research outputs.

Concept and types of artificial intelligence strategies in education

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Artificial Intelligence (AI) in education refers to the application of computer systems that can perform tasks associated with human intelligence, such as reasoning, learning, problem-solving, language understanding, and decision-making, to support teaching, learning, and research [1]. When applied to academic work, AI becomes a strategy, a deliberate tool or approach that students and teachers use to enhance productivity, accuracy, and efficiency in research and learning. AI strategies are not a single technology but a collection of tools and systems designed to assist different aspects of academic work. In the context of tertiary education, these strategies are increasingly being adopted by students to support research activities from topic selection to final report writing [3]. The major types of AI strategies used in education include:

- I. AI-Powered Research and Literature Review Tools: These tools help students to search, summarise, and synthesise academic literature. Examples include Elicit, Consensus, Connected Papers, and Research Rabbit. Instead of manually reading
- II. hundreds of journal articles, students can use these AI tools to identify relevant studies, extract key
- III. findings, and detect research gaps within minutes. This significantly improves the depth and quality
- IV. of literature reviews [4].
- V. Generative AI and Writing Assistants: These are tools that help students generate, refine, and improve academic content. Examples include ChatGPT, QuillBot, and Grammarly. ChatGPT can be used to brainstorm research topics,

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develop research questions, and outline chapters. Grammarly and QuillBot help students to improve grammar, clarity, coherence, and paraphrasing. These tools are useful for students who struggle with academic writing and language expression [7].

- VI. AI for Data Analysis: For students conducting quantitative research, AI-integrated statistical tools such as SPSS with AI features, JASP, and Python-based AI libraries help in cleaning data, running complex analyses, and interpreting results. These tools reduce errors and make statistical analysis more accessible to students without advanced statistical training.
- VII. AI for Plagiarism Detection and Academic Integrity: Tools like Turnitin AI, Copyleaks, and Originality.ai are used by students and supervisors to check the originality of research work. They detect copied content and AI-generated text, thereby helping students to maintain originality and avoid plagiarism [5].
- VIII. AI Research Assistants and Reference Managers: AI-powered reference managers such as Zotero, Mendeley, and Paperpal help students to organize sources, generate citations, and format references in APA, MLA, or other styles. Some AI assistants can also suggest relevant citations while a student is writing
- IX. AI for Learning and Feedback: Some institutions are now using AI tutors and feedback systems that provide instant comments on students' drafts. These systems highlight weak arguments, poor structure, and methodological flaws, thereby guiding students

to improve the quality of their research before submission.

Issues with academic writing using AI

One major issue with using AI for academic writing is academic integrity and plagiarism. Many institutions, including universities and secondary schools in Nigeria, consider submitting AI-generated work without disclosure as a form of academic dishonesty. This is similar to examination malpractice because the student or researcher is presenting work that is not entirely their own. AI tools can also produce text that closely mirrors existing sources without proper citation. If these sources are not verified, the writer risks unintentional plagiarism. For a study like An Evaluation of Teachers' Perceptions of Examination Misconduct, this undermines the credibility of the research and violates ethical standards expected of scholars [9].

Another basic issue is the accuracy and reliability of information. AI models can "hallucinate" by generating false references, statistics, or policies that do not exist. For example, an AI might invent a journal article or misquote the Examination Malpractice Act of 1999 [10]. It may also provide outdated information about TRCN, WAEC, or NECO guidelines because its training data is dated. In academic writing, especially for teacher quality assessment, accuracy is critical because policy recommendations and conclusions must be based on verifiable evidence [11].

Relying blindly on AI without cross-checking sources can therefore weaken the validity of the entire study. AI use also affects critical thinking, writing quality, and proper referencing. Academic writing requires original analysis, argument development, and

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a clear author voice. AI tends to produce generic, surface-level responses that lack the depth and local context needed for Nigerian secondary schools. Overreliance on AI can erode a researcher's ability to synthesise the literature, interpret data, and defend their work during defence or review [12].

In addition, AI often struggles with APA 7th referencing. It may format citations incorrectly or create fake authors and years, such as "Oluwatoyin & Olatunji," which do not exist. This creates problems during vetting because every reference must be traceable in databases like Google Scholar.

Finally, there are ethical and skill development concerns. Many schools and examination bodies are now developing policies on AI use, and failure to disclose AI assistance can lead to penalties. There is also the risk of data privacy when unpublished work is pasted into AI platforms. More importantly, academic writing is meant to build research and communication skills. If students and teachers rely too much on AI to draft literature reviews or discussions, they miss the opportunity to develop those competencies [13]. For teacher quality assessment, this is ironic because one of the criteria for a quality teacher is professionalism and ethical conduct, which includes producing honest, original academic work. Therefore, while AI can be useful for brainstorming, outlining, grammar checking, and paraphrasing, it should not replace the researcher's own thinking. To maintain integrity in academic writing, every AI output must be verified, properly cited, and infused with the writer's own analysis and context.

Effects of artificial intelligence strategies in research quality and originality

The use of Artificial Intelligence strategies is increasingly influencing the quality of research produced by teachers and students in tertiary institutions. Research quality is determined by several factors such as accuracy, depth, reliability, validity, and overall academic standard [14]. AI tools such as ChatGPT, Grammarly, SPSS AI, and Elicit have the capacity to improve these aspects when used appropriately. For instance, in terms of accuracy, AI tools assist in error-free data analysis, grammar correction, and proper referencing, thereby reducing human errors that are common in manual processing [15]. Obviously, poor quality in research undertakings in most university institutions in Nigeria may be a result of limited academic staff with experience in carrying out research; hence, to execute quality research, there is a great need for lecturers' availability with a high level of experience. Unfortunately, many higher institutions in the country do not have these qualified researchers and professors due to brain-drain problems this underscores the need for overreliance on AI [16].

Similarly, AI can process large volumes of literature within a short time, thereby enabling researchers to cover broader scope and produce research that is more current and in-depth [17]. Furthermore, AI contributes to the reliability and validity of research by helping researchers to test research instruments, check data consistency, and apply appropriate statistical methods [18]. This is particularly important for students and teachers who may lack advanced statistical skills. When AI is properly guided, it enhances the overall academic standard of research by

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making research outputs more organized, evidence-based, and professionally presented. However, scholars have also noted that the effectiveness of AI depends largely on the competence of the user to verify and validate AI-generated outputs, because AI systems can sometimes produce inaccurate or "hallucinated" information [19].

In relation to originality, Artificial Intelligence has both positive and negative effects on research work. On the positive side, AI supports idea generation and creativity. Students and teachers can use AI to brainstorm research topics, refine research questions, and explore new perspectives on existing problems [20]. This can stimulate critical thinking and help researchers overcome writer's block. On the other hand, the use of AI raises serious concerns about originality and academic integrity. There is a growing risk of plagiarism as some students copy and submit AI-generated content without proper paraphrasing or citation [21]. Because AI tools can produce similar responses for different users, there is also the possibility of reduced uniqueness in research outputs. In addition, excessive dependence on AI may affect students' critical thinking and independent reasoning skills, since they may allow AI to do the analysis and interpretation for them instead of engaging with the research process themselves [22].

Factors militating against the use of artificial intelligence strategies in tertiary institutions

The adoption of Artificial Intelligence strategies in tertiary institutions is faced with several challenges that limit its effective use by both students and teachers. Despite the benefits of AI in enhancing

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research, teaching, and learning, many institutions in Nigeria, including those in Cross River State, are yet to fully integrate AI into academic practices. These challenges can be grouped into technological, human, ethical, and institutional factors.

One of the major problems militating against the use of AI is poor digital literacy. Many students and teachers lack the basic skills required to effectively use AI tools for research purposes [23]. Without adequate knowledge of how to prompt AI, evaluate outputs, and use AI ethically, users may either avoid AI entirely or use it incorrectly. This is compounded by lack of training on AI tools within tertiary institutions. Most universities, polytechnics, and colleges of education in Nigeria do not have structured programmes to train students and lecturers on the use of AI for research, writing, and data analysis [24].

Another critical challenge is limited internet access and poor ICT infrastructure. The use of AI tools requires stable internet connectivity, electricity, and access to devices such as laptops and smartphones [25]. In many tertiary institutions in Cross River State, students face challenges of poor network, high cost of data, and epileptic power supply, which makes consistent use of AI difficult. Additionally, many AI tools require paid subscriptions, and this poses a financial burden for students.

Ethical concerns also serve as a barrier to AI adoption. There are fears about academic dishonesty, plagiarism, and the authenticity of AI-generated work [21]. Because there are currently no clear institutional policies guiding AI use, many lecturers discourage students from using AI for fear that it promotes laziness and reduces critical thinking. This leads to

over-reliance on AI on one hand, and total rejection of AI on the other hand.

Finally, institutional policies play a major role. Most tertiary institutions in Nigeria do not yet have clear guidelines on the acceptable use of AI in research and assessment [2]. The absence of policy creates confusion among students and teachers about what is permitted. Without policy, training, and infrastructure, the extent of AI use will remain low. Hence, the use of Artificial Intelligence strategies in tertiary institutions is being militated against by poor digital literacy, limited internet access, lack of training, ethical concerns, over-reliance, and absence of institutional policies. Addressing these factors is important if tertiary institutions in Cross River State are to benefit from AI in improving research quality.

Strategies for enhancing the effective and ethical use of artificial intelligence in research

The increasing use of Artificial Intelligence in research calls for deliberate strategies to ensure that it is used effectively and ethically by students and teachers in tertiary institutions. If well managed, AI can improve research quality and originality. However, without proper guidance, it may lead to misuse, plagiarism, and poor academic standards. Therefore, institutions must put in place measures that promote responsible AI use.

One of the most important strategies is AI literacy training and capacity building. Students and teachers need to be trained on how to use AI tools appropriately for research tasks such as literature search, data analysis, writing, and referencing [20]. Workshops, seminars, and hands-on sessions should

be organized by institutions to teach users how to prompt AI effectively, verify AI outputs, and avoid over-reliance. This will help improve digital competence and ensure that AI is used as a support tool rather than a replacement for human thinking.

Policy development and institutional guidelines. Tertiary institutions in Nigeria need clear policies that define acceptable and unacceptable uses of AI in research and assessment [2]. Such policies should address issues of plagiarism, citation of AI-generated content, data privacy, and academic integrity. When students and lecturers know the boundaries, they are more likely to use AI responsibly. The National Universities Commission and other regulatory bodies should also provide a national framework to guide institutions.

Effective supervision and mentorship is also critical. Supervisors and lecturers should guide students on how to integrate AI into their research without compromising originality [22]. Instead of banning AI, supervisors can require students to show their AI prompts, drafts, and how they refined AI outputs. This encourages transparency and helps students develop critical thinking skills while using AI as an assistant.

Furthermore, there is need for integration of AI literacy into the curriculum. AI should not be treated as an extracurricular skill. Courses on research methods, ICT, and academic writing should include modules on ethical AI use, fact-checking, and referencing of AI tools [25]. This will ensure that every graduate leaves school with the competence to use AI effectively in research and in the workplace.

Finally, improving ICT infrastructure and access is essential. Institutions should provide stable internet,

computer labs, and subsidised access to AI tools for students [23]. Partnerships with AI companies can also help schools get educational discounts. This will reduce the barrier of cost and poor connectivity that currently limits AI use in Cross River State.

Implications of AI for research quality

The use of AI in academic writing has significant implications for the quality and credibility of research. One major implication is on validity and reliability of findings. Research quality depends on accurate data, correct citations, and verifiable sources. When AI is used without proper verification, it can introduce false information, fabricated references, or outdated policies. For example, if a study on examination misconduct in Nigerian secondary schools cites a non-existent WAEC report or misquotes the Examination Malpractice Act of 1999 [10], the entire argument becomes questionable. This reduces the trustworthiness of the research and undermines its contribution to knowledge [11].

Another implication is on originality and critical thinking. High-quality research requires the researcher to engage deeply with literature, identify gaps, and provide original analysis. Overreliance on AI can lead to generic, repetitive content that lacks depth and context-specific insight. In the case of teacher quality assessment in Nigeria, AI may list TRCN's criteria of subject knowledge, pedagogy, and ethics [13], but it may fail to connect these to the realities of Cross River State schools, such as pressure on teachers to aid malpractice. Without the researcher's own synthesis, the study risks being superficial and will not add meaningful value to existing literature [12].

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There is also an implication for academic integrity and ethical standards. Research quality is judged not only by content but also by the process through which it was produced. If AI is used to write major sections without disclosure, it violates ethical principles of honesty and authorship. This is particularly important in education research because teachers are expected to model integrity as part of professional standards [26]. A study that examines teachers' perceptions of examination misconduct will lose credibility if the researcher is found to have engaged in a similar form of academic dishonesty through undisclosed AI use.

Finally, AI use affects reproducibility and peer review. Good research should be transparent so that others can replicate methods and verify results. AI-generated text often lacks a clear trail of how ideas were developed, and AI-generated references may be impossible to locate. This makes it difficult for supervisors, examiners, or journal reviewers to assess the rigor of the work. In summary, while AI can improve efficiency in drafting, editing, and organizing academic work, it poses risks to research quality if not used responsibly. To protect the integrity of research, scholars must treat AI as a support tool only: verify all facts and references, ensure original analysis, and maintain transparency about its use. This way, research on critical issues like examination misconduct and teacher quality can remain credible, ethical, and useful for policy and practice in Nigerian education

Summary

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This study examined the extent of use of Artificial Intelligence strategies by students and teachers in tertiary institutions in Cross River State, with a focus on research activities. The review revealed that AI tools are increasingly being used for topic selection, literature search, data analysis, academic writing, and referencing. When used appropriately, AI has the potential to improve the accuracy, depth, reliability, and overall academic standard of research outputs. It also supports idea generation and creativity among students and teachers. However, the review also showed that the use of AI has an effect on originality and critical thinking. While AI can enhance brainstorming and synthesis of ideas, over-reliance on AI and direct copying of AI-generated content pose threats to originality and academic integrity. Several factors were identified as militating against the effective use of AI in tertiary institutions. These include poor digital literacy, limited internet access and ICT infrastructure, lack of training, ethical concerns, over-reliance on AI, and absence of clear institutional policies on AI use. These challenges have limited the extent to which students and teachers in Cross River State can benefit from AI in research. To address these challenges, the study suggested several strategies. These include provision of AI literacy training, development of institutional policies to guide AI use, effective supervision and mentorship by lecturers, integration of AI literacy into the curriculum, and improvement of ICT infrastructure to enhance access. When these strategies are implemented, AI can be used effectively and ethically to improve research quality in tertiary institutions.

Conclusion

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In conclusion, Artificial Intelligence has become an important tool in academic research. Its use by students and teachers in tertiary institutions in Cross River State is growing, but it is still faced with challenges related to skills, infrastructure, ethics, and policy. The effects of AI on research are two-sided: it can improve quality and efficiency, but it can also reduce originality and critical thinking if not properly managed. Therefore, for tertiary institutions in Cross River State to maximise the benefits of AI, deliberate efforts must be made to train users, develop clear policies, provide necessary infrastructure, and embed AI literacy in the curriculum. With proper guidance, AI can serve as a powerful support tool that enhances the quality, speed, and originality of research without compromising academic standards. However, the government, in collaboration with other foreign universities, including Nigerians in Diaspora should trigger the Nigerian Experts and Academics in Diaspora Scheme (NEADS) to create an enabling environment to attract academics of Nigerians in the diaspora to contribute their expert knowledge to the development of the Nigerian university system. This will help to foster foreign investment in our educational system. which to a large extent, limits overemphasis on AI tools for academic quality of research exercises.

Educational Implications of the Study

The findings of this study have several important implications for education, especially for teaching and supervision, curriculum development, research

practices and students' learning in tertiary institutions

- i. **Implication for Teaching and Supervision:** The study shows that AI tools are already being used by students for research tasks. This implies that lecturers and supervisors can no longer ignore AI in academic work. Instead of banning AI, educators should adopt it as a teaching and supervisory tool. Supervisors can guide students on how to use AI to brainstorm, organize ideas, and improve writing, while still ensuring that students demonstrate understanding and originality. This will shift the role of teachers from “information providers” to “AI literacy mentors” who train students to use AI responsibly.
- ii. **The government should provide ICT facilities (software) to all tertiary institutions at affordable prices so students are well equipped with the training skills rudiment for enhanced skills in data analysis [27].**
- iii. **Implication for Curriculum Development:** The study revealed gaps in digital literacy and lack of training on AI. This implies that AI literacy should be integrated into the curriculum of tertiary institutions. Courses on Research Methods, ICT, and Academic Writing should include modules on ethical AI use, prompt engineering, fact-checking, and referencing of AI-generated content. By doing this, graduates will leave school with the competence to use AI effectively in research, teaching, and the workplace, making them more competitive in the 21st-century knowledge economy.

- iv. Implication for Research Quality and Academic Integrity: The dual effect of AI on research quality and originality implies that institutions must put structures in place to protect academic standards. On one hand, AI can improve the depth, accuracy, and speed of research. On the other hand, misuse can lead to plagiarism and shallow thinking. Therefore, institutions need to develop clear policies on AI use, promote transparency by asking students to submit AI prompts and drafts, and use AI detection tools alongside human judgment to maintain originality.
- v. Implication for Institutional Policy and Infrastructure: The challenges of poor internet access, high cost of data, and lack of institutional policy identified in the study imply that school management and government must invest in ICT infrastructure. Stable internet, computer labs, and subsidised access to AI tools will make AI more accessible to students. The National Universities Commission and institutional management should also develop national and institutional guidelines that define acceptable AI use in research and assessment.
- vi. Implication for Students' Learning and Skill Development: For students, the study implies that AI should be used as a support tool, not a replacement for thinking. When used well, AI can help students overcome writer's block, improve clarity of writing, and handle complex data analysis. However, over-reliance will weaken critical thinking, problem-solving, and independent research skills, which are core outcomes of tertiary education. Students therefore need to be trained to balance AI assistance with their own intellectual effort.

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