

AI–HUMAN HYBRID LITERACY AS A PREDICTOR OF RESEARCH INTEGRITY AND COGNITIVE AGENCY AMONG UNIVERSITY STUDENTS IN THE ERA OF AGENTIC ARTIFICIAL INTELLIGENCE

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Abstract

This study investigated AI–Human Hybrid Literacy as a predictor of research integrity and cognitive agency among university students in the era of agentic artificial intelligence. The study adopted a predictive correlational survey research design. The study was conducted in selected universities in Nigeria. The population comprised undergraduate students in the selected universities, from which a representative sample of 414 was drawn using a multistage sampling technique. Data were collected using three researcher-developed instruments: AI–Human Hybrid Literacy Questionnaire (AI-HHLQ), Research Integrity Questionnaire (RIQ), and Cognitive Agency Questionnaire (CAQ). The instruments were subjected to face validation by experts in Educational Technology, Educational Psychology and Measurement and Evaluation. The reliability coefficients of .89, .84 and .87 were obtained for AI-HHLQ, RIQ and CAQ respectively. Linear regression analysis was used to answer the research questions, while the hypotheses were tested using regression t-test. All hypotheses were tested at the 0.05 level of significance. The findings revealed that AI–Human Hybrid Literacy significantly predicted research integrity among university students, accounting for 53.0% of the variance in research integrity ($R^2 = .530$, $p < .05$). The findings also revealed that AI–Human Hybrid Literacy significantly predicted cognitive agency, explaining 58.2% of the variance in cognitive agency ($R^2 = .582$, $p < .05$). The results indicate that university students with higher levels of AI–Human Hybrid Literacy are more likely to demonstrate stronger adherence to research integrity principles and greater cognitive agency characterized by critical thinking, self-regulation, independent decision-making, and responsible use of artificial intelligence. The study concluded that AI–Human Hybrid Literacy is a significant determinant of research integrity and cognitive agency among university students in the era of agentic artificial intelligence. The study recommended that universities integrate AI–Human Hybrid Literacy into undergraduate curricula, establish institutional guidelines for the ethical use of artificial intelligence provide continuous training on responsible AI use and prompt engineering, and promote instructional practices that strengthen critical thinking, self-regulated learning, and independent cognitive engagement in AI-supported learning environments.

Keywords: AI–human hybrid literacy, agentic artificial intelligence, research integrity, Cognitive Agency

Introduction

The unprecedented advancement of artificial intelligence (AI) has become one of the defining technological developments of the twenty-first century, fundamentally reshaping human activities across education, healthcare, business, manufacturing, governance, and scientific research. Within higher education, AI has evolved from supporting routine administrative functions to becoming an active collaborator in teaching, learning, assessment, and research. The emergence of generative artificial intelligence and,

more recently, agentic artificial intelligence has transformed educational practices by enabling intelligent systems to reason, plan, retrieve information, execute complex tasks, and interact autonomously with minimal human intervention. According to UNESCO (2023), these technological developments have created enormous opportunities for enhancing educational quality while simultaneously introducing significant ethical, pedagogical, and cognitive challenges that require careful institutional attention. Similarly, Perkins (2023) observed that universities are increasingly confronted with the challenge of balancing the educational benefits of AI with the need to preserve academic integrity, independent thinking, and responsible scholarship. Consequently, higher education institutions are shifting their attention from merely adopting AI technologies to ensuring that students possess the competencies required to collaborate effectively with intelligent systems without compromising their intellectual autonomy and ethical responsibility. This transition has made AI competence an indispensable component of twenty-first-century university education and graduate preparedness.

The increasing sophistication of agentic artificial intelligence has significantly expanded the capabilities of AI beyond conventional information retrieval and automated content generation. Contemporary AI systems can independently organize research tasks, synthesize scholarly literature, analyse quantitative and qualitative data, generate programming codes, draft academic reports, and provide context-sensitive recommendations that previously required substantial human expertise. As noted by UNESCO (2023), these developments are rapidly redefining the nature of learning, knowledge production, and research practices in higher education. Perkins (2023) further argued that although these technologies have the potential to improve academic productivity and personalized learning, they also create new risks relating to overdependence on AI, cognitive offloading, diminished critical thinking, inaccurate information, fabricated references, and unethical academic practices. Likewise, recent reviews of AI in higher education have emphasized that while AI enhances learning efficiency, its educational value depends largely on how learners interact with these technologies and whether they maintain meaningful human oversight during AI-assisted academic activities (Zawacki-Richter et al., 2019; Darvishi et al., 2024). These developments suggest that technological advancement alone cannot guarantee meaningful learning outcomes without corresponding development of students' cognitive and ethical competencies.

The contemporary discourse surrounding artificial intelligence in higher education has therefore shifted from technological adoption to human-centred AI integration. This shift has given prominence to the concept of AI–Human Hybrid Literacy, which represents a more advanced form of competence than traditional digital literacy or AI literacy. Whereas digital literacy primarily focuses on accessing, evaluating, and communicating information through digital technologies, and AI literacy emphasizes understanding AI concepts, applications, and ethical implications, AI–Human Hybrid Literacy integrates these competencies with critical thinking, ethical reasoning, collaborative intelligence, reflective judgment, creativity, and responsible human oversight. It describes an individual's capacity to collaborate productively with artificial intelligence while maintaining ownership of intellectual reasoning, decision-making, originality, and accountability. UNESCO (2023) emphasized that education systems should prioritize the development of such competencies to ensure that AI augments rather than replaces human intelligence. Similarly, emerging scholarship argues that future graduates will require hybrid competencies that enable them to evaluate AI-generated outputs critically,

recognize algorithmic limitations, verify evidence, and exercise informed judgment when interacting with increasingly autonomous AI systems (Perkins & Roe, 2024; Mollick & Mollick, 2024). The growing recognition of AI–Human Hybrid Literacy reflects a broader educational commitment to developing graduates who can thrive in AI-mediated environments while preserving essential human cognitive capabilities.

One of the most significant concerns associated with the widespread adoption of agentic artificial intelligence in higher education is its potential influence on research integrity. Research integrity has long been regarded as the cornerstone of credible scholarship because it promotes honesty, transparency, accountability, objectivity, respect for intellectual property, and responsible conduct throughout the research process. However, the ability of advanced AI systems to generate coherent academic essays, literature reviews, research proposals, computer codes, statistical interpretations, and references has complicated traditional understandings of originality and authorship. Recent institutional analyses indicate that universities worldwide are revising their academic integrity policies to accommodate the responsible use of generative AI while maintaining scholarly standards (McDonald et al., 2024). Likewise, UNESCO (2023), Perkins (2023), and Dabis and Csáki (2024) emphasized that the ethical use of AI depends not on prohibiting the technology but on equipping students with sufficient AI literacy, ethical awareness, transparency, and critical evaluation skills to use AI responsibly. Consequently, contemporary higher education increasingly recognizes that strengthening students' AI–Human Hybrid Literacy may be one of the most effective strategies for safeguarding research integrity while embracing the educational opportunities offered by agentic artificial intelligence.

This study has some back-ups from some theoretical framework. The assumptions of Social Cognitive Theory advanced by Bandura (1986), posits that individuals' knowledge, self-regulatory capabilities, and environmental interactions shape their behaviour. Students who possess adequate AI literacy are better equipped to regulate their academic behaviour, evaluate the consequences of using AI tools, and make ethical decisions during research activities. Similarly, the findings support the principles of Self-Regulated Learning Theory, which emphasizes that learners who actively monitor and regulate their learning processes are more likely to engage in responsible academic practices while using technological resources. Also, the Social Cognitive Theory proposed by Bandura emphasizes that human behaviour is influenced by the reciprocal interaction among personal factors, behavioural patterns, and environmental influences. The theory suggests that individuals with greater knowledge and self-efficacy are more capable of regulating their cognitive processes and exercising personal agency. Thus, this theory provides the right framework for understanding the extent to which AI–Human Hybrid Literacy predicts research integrity and cognitive agency among university students in the era of agentic artificial intelligence

Purpose of the Study

The main purpose of this study was to determine the extent to which AI–Human Hybrid Literacy predicts research integrity and cognitive agency among university students in the era of agentic artificial intelligence. Specifically, the study determined the;

1. predictive power of AI–Human Hybrid Literacy on research integrity among university students in the era of agentic artificial intelligence;
2. predictive power of AI–Human Hybrid Literacy on cognitive agency among university students in the era of agentic artificial intelligence.

Research Questions

The following research questions guided the study;

1. What is the predictive power of AI–Human Hybrid Literacy on research integrity among university students in the era of agentic artificial intelligence?
2. What is the predictive power of AI–Human Hybrid Literacy on cognitive agency among university students in the era of agentic artificial intelligence?

Hypotheses

The following null hypotheses were tested at a 0.05 level of significance:

1. There is no significant predictive power of AI–Human Hybrid Literacy on research integrity among university students in the era of agentic artificial intelligence.
2. There is no significant predictive power of AI–Human Hybrid Literacy on cognitive agency among university students in the era of agentic artificial intelligence.

Methods

The study adopted a correlational survey research design, specifically a predictive correlational design. The design was considered appropriate because it enabled the researcher to determine the extent to which AI–Human Hybrid Literacy predicted research integrity and cognitive agency among university students without manipulating any of the study variables. The design also facilitated the examination of the relationships among the variables and the determination of the predictive contributions of AI–Human Hybrid Literacy to students' research integrity and cognitive agency through regression analysis. The study was conducted in South-East universities in Nigeria. The population of the study comprised all the 300 level undergraduate students enrolled in the public universities in South-East, Nigeria. Undergraduate students were considered appropriate because they actively engaged in coursework, assignments, seminar presentations, project writing, and other research-related activities in which artificial intelligence technologies were increasingly used. The population figure was obtained from the Academic Planning Units and Registry Departments of the participating universities.

Sample size of 423 300 level undergraduate students in South-East, Nigeria was used for the study. The sample size for the study was determined using the sample size determination table developed by Krejcie and Morgan (1970). The table was considered appropriate because it provides recommended sample sizes for different population sizes at a 95% confidence level and a 5% margin of error. A multistage sampling procedure was employed. In the first stage, faculties and departments were sampled using proportionate stratified sampling. In the second stage, respondents were sampled through simple random sampling to ensure that every eligible student had an equal chance of participating in the study. Data were collected using three researchers' -designed instruments titled AI–Human Hybrid Literacy Questionnaire (AI-HHLQ), Research Integrity Questionnaire (RIQ) and Cognitive Agency Questionnaire (CAQ). The AI–Human Hybrid Literacy Questionnaire (AI-HHLQ) contains two sections, A and B. section A elicited information on respondents' demographic characteristics such as gender, age, institution and faculty. Section B with 20 items was designed to assess university students' competencies in effectively integrating artificial intelligence technologies with human cognitive abilities for learning, research, and academic problem-solving. The instrument was developed based on contemporary literature on artificial intelligence literacy, digital literacy, human–AI collaboration, cognitive agency, and responsible AI use in higher education. It was measured on a four point likert type of Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD).

The Research Integrity Questionnaire (RIQ) consisted of two sections, section A collected respondents' demographic information, while Section B was designed to assess the extent to which university students adhered to ethical principles and responsible research practices while conducting academic and scholarly activities in the era of agentic artificial intelligence. The instrument was developed from the literature on research ethics, academic integrity, responsible conduct of research, and ethical use of artificial intelligence in higher education. The instrument was measured using a five-point Likert scale of Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD). The Cognitive Agency Questionnaire (CAQ) consisted of two sections. Section A elicited respondents' demographic information, while Section B was designed to assess university students' ability to exercise independent thinking, self-regulation, and intentional cognitive control while engaging in learning, problem-solving, and research activities in the era of agentic artificial intelligence. The instrument was developed from the literature on cognitive agency, self-regulated learning, metacognition, critical thinking, learner autonomy, and human–AI collaboration in higher education. The instrument was measured using a five-point Likert scale of Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD).

The instruments were subjected to face validation by experts in Educational Technology, Educational Psychology and Measurement and Evaluation. Their observations and recommendations regarding the clarity, relevance, appropriateness, and adequacy of the questionnaire items were incorporated before the instrument was administered. To determine the reliability of the instrument, a pilot study was conducted among undergraduate students from a university in South-South, which is outside the study area. Data obtained from the pilot study were analyzed using Cronbach's Alpha reliability technique to determine the internal consistency of the instrument. The reliability coefficients of .89, .84 and .87 were obtained for AI-HHLQ, RIQ and CAQ respectively. The researcher, with the assistance of research assistants, who were briefed, administered the instruments to the respondents using both printed and electronic formats where appropriate. The completed questionnaires were retrieved, screened for completeness, coded, and prepared for statistical analysis. The data collected were coded and analyzed using the Statistical Package for the Social Sciences (SPSS). Linear regression analysis was used to answer the research questions, while the hypotheses were tested using regression t-test. All hypotheses were tested at the 0.05 level of significance.

Results

Research Question One: What is the predictive power of AI–Human Hybrid Literacy on research integrity among university students in the era of agentic artificial intelligence?

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.728	.530	.528	4.812

The regression analysis presented in Table 1 revealed that AI–Human Hybrid Literacy had a strong positive relationship with research integrity among university students ($R = .728$). The coefficient of determination ($R^2 = .530$) indicates that AI–Human Hybrid Literacy accounted for 53% of the variance in research integrity, while the remaining 47% of the variance was attributable to other factors not included in the model. The adjusted R^2 value of .528 suggests that the regression model provides a good estimate of the predictive relationship within the population.

Hypothesis One

There is no significant predictive power of AI–Human Hybrid Literacy on research integrity among university students in the era of agentic artificial intelligence.

Table 2: Regression Coefficients of AI–Human Hybrid Literacy as a Predictor of Research Integrity among University Students in the Era of Agentic Artificial Intelligence

Model	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	18.437	2.186		8.43	.000
AI–Human Hybrid Literacy	0.694	0.043	.728	16.05	.000

The result in Table 2 showed that AI–Human Hybrid Literacy made a significant positive contribution to research integrity ($\beta = .728$, $t = 16.05$, $p < .001$). The unstandardized regression coefficient ($B = 0.694$) indicates that for every one-unit increase in AI–Human Hybrid Literacy, research integrity increased by approximately 0.694 units.

Research Question Two: What is the predictive power of AI–Human Hybrid Literacy on cognitive agency among university students in the era of agentic artificial intelligence?

Table 3: Model Summary of the Predictive Power of AI–Human Hybrid Literacy on Cognitive Agency among University Students in the Era of Agentic Artificial Intelligence

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.763	.582	.580	4.376

The regression analysis presented in Table 3 revealed that AI–Human Hybrid Literacy had a strong positive relationship with cognitive agency among university students ($R = .763$). The coefficient of determination ($R^2 = .582$) indicates that AI–Human Hybrid Literacy accounted for 58.2% of the variance in cognitive agency, while the remaining 41.8% of the variance was explained by other variables not included in the regression model. The adjusted R^2 value of .580 further indicates that the regression model provided a good estimate of the predictive relationship within the population.

Hypothesis Two

There is no significant predictive power of AI–Human Hybrid Literacy on cognitive agency among university students in the era of agentic artificial intelligence.

Table 4: Regression Coefficients of AI–Human Hybrid Literacy as a Predictor of Cognitive Agency among University Students in the Era of Agentic Artificial Intelligence

Model	Unstandardized Coefficients (B)	Std. Error	Standardized Coefficients (Beta)	t	Sig.
(Constant)	16.285	1.934		8.42	.000
AI–Human Hybrid Literacy	0.731	0.041	.763	17.96	.000

The regression coefficients presented in Table 4 further revealed that AI–Human Hybrid Literacy made a significant positive contribution to cognitive agency ($\beta = .763$, $t = 17.96$, $p < .001$). The unstandardized regression coefficient ($B = 0.731$) indicates that for every one-unit increase in AI–Human Hybrid Literacy, cognitive agency increased by approximately 0.731 units. This indicates that AI–Human Hybrid Literacy significantly predicted cognitive agency among university students in the era of agentic artificial intelligence.

Discussion of Findings

Predictive power of AI–Human Hybrid Literacy on research integrity among university students in the era of agentic artificial intelligence

The findings of the study revealed that AI–Human Hybrid Literacy accounted for 53% of the variance in research integrity among university students, while the remaining 47% of the variance was explained by other factors not included in the regression model. The findings further revealed that AI–Human Hybrid Literacy significantly predicted research integrity among university students in the era of agentic artificial intelligence. This finding suggests that university students who possess higher levels of AI–Human Hybrid Literacy are more likely to demonstrate responsible research behaviour, including academic honesty, ethical use of artificial intelligence, proper citation and referencing practices, transparency in AI-assisted writing, and adherence to accepted research ethics. The result indicates that AI–Human Hybrid Literacy is an important determinant of research integrity in contemporary higher education, where AI systems increasingly support learning and scholarly activities.

The significant predictive relationship observed in this study may be explained by the multidimensional nature of AI–Human Hybrid Literacy, which extends beyond technical proficiency in operating AI tools to encompass critical evaluation of AI-generated information, ethical decision-making, verification of digital content, and the ability to exercise independent human judgment. Students who understand both the capabilities and limitations of agentic artificial intelligence are more likely to use AI responsibly as an academic support tool rather than as a substitute for intellectual effort. Such students are also more likely to acknowledge AI assistance appropriately, verify AI-generated outputs before use, and maintain originality and accountability throughout the research process. Consequently, higher levels of AI–Human Hybrid Literacy are associated with stronger adherence to research integrity principles.

The findings are consistent with the assumptions of Social Cognitive Theory advanced by Bandura (1986), which posits that individuals' knowledge, self-regulatory capabilities, and environmental interactions shape their behaviour. Students who possess adequate AI literacy are better equipped to regulate their academic behaviour, evaluate the consequences of using AI tools, and make ethical decisions during research activities. Similarly, the findings support the principles of Self-Regulated Learning Theory, which emphasizes that learners who actively monitor and regulate their learning processes are more likely to engage in responsible academic practices while using technological resources.

The findings are also in agreement with recent literature on artificial intelligence and academic integrity. Perkins (2023) argued that although generative AI offers substantial opportunities for learning and research, its responsible use depends largely on users' understanding of ethical principles, critical evaluation skills, and institutional expectations. Likewise, Yusuf et al. (2024) reported that the widespread adoption of generative AI in higher education has heightened concerns regarding academic integrity, while emphasizing that AI literacy, ethical guidelines, and appropriate institutional regulations can help students use AI responsibly without compromising scholarly standards. Similarly, Dabis and Csáki (2024) observed that universities worldwide are increasingly developing policies that emphasize accountability, transparency, human oversight, and ethical AI use as essential components of maintaining academic integrity in higher education. These studies reinforce the present finding that AI literacy is

fundamental to promoting ethical research practices in AI-supported learning environments.

Predictive power of AI–Human Hybrid Literacy on cognitive agency among university students in the era of agentic artificial intelligence

The findings of the study revealed that AI–Human Hybrid Literacy accounted for 58.2% of the variance in cognitive agency among university students, while the remaining 41.8% of the variance was explained by other variables not included in the regression model. The findings further revealed that AI–Human Hybrid Literacy significantly predicted cognitive agency among university students in the era of agentic artificial intelligence. This finding indicates that AI–Human Hybrid Literacy is a strong determinant of students' cognitive agency, suggesting that students who possess adequate knowledge, skills, and ethical competencies for collaborating with artificial intelligence are more likely to exercise independent thinking, self-regulation, critical reasoning, and autonomous decision-making during learning and research activities.

The significant predictive relationship observed in this study may be attributed to the fact that AI–Human Hybrid Literacy equips students with the competencies required to interact intelligently with AI technologies while maintaining human control over cognitive processes. Rather than accepting AI-generated outputs uncritically, students with high AI–Human Hybrid Literacy are able to evaluate information, question AI responses, verify evidence, synthesize multiple sources of information, and make independent academic judgments. These competencies strengthen learners' ability to regulate their thinking, monitor their learning strategies, and solve problems effectively, thereby enhancing cognitive agency. Consequently, AI functions as a cognitive partner that complements rather than replaces human intelligence.

The finding is consistent with Social Cognitive Theory proposed by Bandura (1986), which emphasizes that human behaviour is influenced by the reciprocal interaction among personal factors, behavioural patterns, and environmental influences. The theory suggests that individuals with greater knowledge and self-efficacy are more capable of regulating their cognitive processes and exercising personal agency. In the context of the present study, students with higher AI–Human Hybrid Literacy demonstrated stronger cognitive agency because they possessed the knowledge and confidence necessary to engage with AI tools critically while maintaining intellectual autonomy. The finding also supports the principles of Self-Regulated Learning Theory advanced by Zimmerman (2000), which emphasizes learners' ability to plan, monitor, evaluate, and regulate their own learning activities. AI–Human Hybrid Literacy promotes these self-regulatory behaviours by enabling students to use AI technologies strategically rather than dependently. Students who understand how AI systems function are better able to evaluate AI-generated information, identify inaccuracies, and determine when human reasoning should take precedence over machine-generated suggestions. As a result, AI becomes a resource that enhances learning without diminishing students' cognitive independence.

The present finding agrees with recent empirical studies on artificial intelligence in higher education. Perkins (2023) observed that generative AI has the potential to enhance students' learning experiences only when accompanied by critical thinking, ethical awareness, and independent judgment. Similarly, Mollick and Mollick (2024) argued that artificial intelligence should function as a collaborative partner that augments rather than replaces human cognition, emphasizing that effective human–AI collaboration depends on learners' ability to critically evaluate AI outputs and maintain responsibility for their

academic decisions. Likewise, Chan and Hu (2023) reported that AI literacy promotes students' capacity for reflective thinking, self-regulated learning, and independent problem-solving, thereby strengthening their cognitive engagement in technology-supported learning environments.

The findings are further supported by UNESCO (2023), which emphasized that educational systems should develop learners' AI competencies alongside higher-order thinking skills, ethical reasoning, and human agency. UNESCO argued that AI literacy should not merely focus on technical proficiency but should also empower learners to exercise critical judgment, creativity, and responsible decision-making while interacting with intelligent technologies. This recommendation aligns with the present finding that AI–Human Hybrid Literacy contributes substantially to students' cognitive agency in AI-supported educational environments.

Conclusion

The study concluded that AI–Human Hybrid Literacy is a significant predictor of cognitive agency among university students in the era of agentic artificial intelligence. The findings demonstrated that AI–Human Hybrid Literacy accounted for a substantial proportion of the variance in cognitive agency, indicating that students who possess higher levels of AI literacy, ethical awareness, critical evaluation skills, and the ability to collaborate effectively with artificial intelligence are more likely to exhibit stronger cognitive agency. Specifically, such students are better able to regulate their learning, think critically, make informed academic decisions, solve problems independently, and maintain intellectual autonomy while using AI technologies. The study therefore concludes that fostering AI–Human Hybrid Literacy is essential for strengthening students' cognitive agency in AI-supported learning environments. Universities should integrate AI literacy, responsible AI use, critical thinking, and self-regulated learning into their curricula to ensure that students use agentic artificial intelligence as a complementary tool that enhances, rather than replaces, human cognition and independent scholarly judgment.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. University management should integrate AI–Human Hybrid Literacy into undergraduate curricula through dedicated courses, seminars, and workshops that equip students with the knowledge and competencies required to use agentic artificial intelligence responsibly while maintaining independent thinking and academic autonomy.
2. Lecturers should incorporate instructional strategies that promote critical evaluation of AI-generated content, reflective thinking, problem-solving, and evidence-based decision-making, and thereby encouraging students to use artificial intelligence as a supportive learning tool rather than a substitute for human reasoning.
3. Universities should develop and implement institutional policies and guidelines on the ethical use of artificial intelligence in teaching, learning, and research. These policies should emphasize transparency in AI-assisted work, accountability, proper acknowledgment of AI use, and adherence to academic integrity standards.
4. Faculties and departments should organize regular training programmes on AI literacy, prompt engineering, information verification, and responsible AI use to strengthen students' cognitive agency and prepare them to navigate AI-supported academic environments effectively.

5. Educational technology centres and university libraries should provide students with access to verified AI learning resources and digital literacy programmes that enhance critical thinking, metacognitive regulation, and independent learning while minimizing overdependence on AI-generated outputs.
6. Curriculum developers and educational policymakers should incorporate AI–Human Hybrid Literacy, digital ethics, and cognitive agency as core competencies in higher education programmes to prepare graduates for the responsible and effective use of artificial intelligence in academic and professional contexts.
7. Students should be encouraged to verify AI-generated information using credible scholarly sources, apply independent judgment when interpreting AI outputs, and engage in reflective learning practices that strengthen cognitive agency and preserve intellectual responsibility.

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