

Artificial Intelligence Literacy Among Psychology Undergraduate Students

Zaine Zulkifli^{1*}, Muhammad Redza Mohd Radzi², Siti Atiyah Ali³, Nurfaizatul Aisyah Ab Aziz⁴

^{1,3,4} Faculty of Cognitive Sciences and Human Development, Universiti Malaysia Sarawak

² Faculty of Resource Science and Technology, Universiti Malaysia Sarawak

Corresponding Author

DOI: <https://doi.org/10.47772/IJRISS.2026.100800127>

Received: 13 August 2026; Accepted: 18 August 2026; Published: 27 August 2026

ABSTRACT

Artificial intelligence (AI) is increasingly embedded in higher education, reshaping how students learn, evaluate information, and prepare for professional practice. Despite this rapid integration, AI literacy remains uneven across disciplines, particularly in non-technical fields such as psychology. This quantitative action research study examined the baseline level of AI literacy among Psychology undergraduate students at Universiti Malaysia Sarawak (UNIMAS) and evaluated the effectiveness of a structured, short-term instructional intervention designed to enhance cognitive and ethical dimensions of AI literacy. Using a pre-test–post-test design, 35 Psychology undergraduates completed the AI Literacy Questionnaire before and after a one-day intervention comprising two instructional sessions. Descriptive and inferential analyses revealed statistically significant improvements in both cognitive and ethical AI literacy following the intervention, with large effect sizes. These findings demonstrate that targeted, discipline-relevant AI literacy instruction can substantially strengthen psychology students' conceptual understanding of AI and ethical awareness. The study contributes to the scholarship of teaching and learning (SoTL) by providing empirical evidence to support the systematic integration of AI literacy into psychology and social science curricula.

Keywords: AI literacy, psychology students, ethics in AI

INTRODUCTION

Artificial intelligence (AI) has rapidly transformed the landscape of higher education, influencing teaching, learning, assessment, and knowledge production. From adaptive learning systems and intelligent tutoring platforms to generative technologies such as large language models, AI tools are increasingly embedded in students' academic practices. These developments offer substantial pedagogical benefits, including personalised learning pathways, enhanced feedback, and increased learning efficiency. However, they also raise concerns related to over-reliance on automated systems, ethical misuse, academic integrity, and students' limited capacity to critically evaluate AI-generated outputs.

AI literacy defined as the ability to understand, evaluate, and use AI technologies responsibly and effectively-has therefore emerged as a critical graduate competency in the era of the Fourth Industrial Revolution (Long & Magerko, 2020; Ng et al., 2021). While formal AI instruction is well established in computer science and engineering, students in non-technical disciplines often engage with AI tools informally, without systematic guidance or conceptual grounding. This gap is particularly salient in psychology, where students increasingly use AI for academic writing, research support, assessment preparation, and learning management, yet must also navigate strict ethical standards related to human data, bias, and professional responsibility.

Within the Malaysian higher education context, national policies emphasise digital competence, ethical technology use, and future-ready graduates aligned with Industry 4.0 and Sustainable Development Goal 4 (Quality Education). Despite these priorities, empirical evidence suggests that AI literacy remains uneven among university students, especially outside STEM disciplines (Butt et al., 2025; Mastam et al., 2024). Without adequate AI literacy, psychology students risk misinterpreting AI-generated information, engaging in unethical academic practices, and failing to critically evaluate AI tools that may shape psychological knowledge and practice.

In this context, the present study examines AI literacy among Psychology undergraduate students at Universiti Malaysia Sarawak (UNIMAS). Specifically, the study aims to assess students' baseline cognitive and ethical AI literacy, design and implement a targeted AI literacy intervention tailored to psychology education, and evaluate the effectiveness of the intervention in improving AI literacy outcomes. By adopting a quantitative action research approach, this study contributes to the scholarship of teaching and learning by linking pedagogical intervention with empirically measured learning outcomes.

LITERATURE REVIEW

AI technologies have been widely adopted in higher education to enhance instructional design, student engagement, and learning outcomes. Adaptive learning platforms and intelligent tutoring systems have demonstrated positive effects on student performance, particularly among learners requiring additional support (Fariani et al., 2023; Tapalova & Zhiyenbayeva, 2022). Generative AI tools, such as ChatGPT, further expand educational possibilities by supporting idea generation, language learning, and problem-solving (Farrokhnia et al., 2023). However, the rapid diffusion of these tools has intensified concerns regarding academic integrity, learner dependency, and ethical decision-making (Bearman et al., 2022; Eke, 2023).

AI literacy extends beyond technical proficiency or coding skills. Long and Magerko (2020) conceptualised AI literacy as a multidimensional construct encompassing knowledge of AI concepts, the ability to interact with AI systems, and understanding of their societal and ethical implications. Building on this work, Ng et al. (2021) proposed a comprehensive framework emphasising understanding AI principles, applying AI across contexts, evaluating AI systems, and considering ethical issues. This framework underscores the importance of critical thinking and responsible AI engagement.

Ng et al. (2024) further operationalised AI literacy through the Affective-Behavioural-Cognitive-Ethical (ABCE) framework, providing a validated measurement instrument for educational research. In higher education contexts, the cognitive and ethical dimensions are particularly salient. Cognitive AI literacy refers to understanding AI concepts, applications, and higher-order thinking skills such as evaluation. Ethical AI literacy encompasses awareness of bias, privacy, transparency, responsibility, and social good.

The proliferation of generative AI has amplified ethical challenges in education, including bias in AI-generated content, data privacy concerns, and threats to academic integrity (Chiu, 2023; Lodge et al., 2024). For psychology students, these concerns are especially critical due to the discipline's emphasis on ethical conduct, responsible use of human data, and professional accountability. Research suggests that students may rely heavily on AI tools without sufficient critical engagement or ethical reflection (Zhai et al., 2023), highlighting the need for structured educational interventions.

Intervention-based studies demonstrate that targeted AI literacy curricula can improve learners' understanding, attitudes, and responsible use of AI (Su & Yang, 2023). However, empirical research focusing on psychology students and Southeast Asian contexts remains limited, underscoring the significance of the present study.

METHODOLOGY

This study employed a quantitative action research design using a one-group pre-test-post-test approach. The action research framework was selected to align instructional intervention with systematic evaluation, allowing the teaching strategy to be refined while generating empirical evidence of learning outcomes among psychology students.

Participants were 35 undergraduate students enrolled in the Psychology programme at Universiti Malaysia Sarawak (UNIMAS). Purposive sampling was used to recruit students who were actively engaged in coursework involving digital tools and academic technologies. Participation was voluntary, and informed consent was obtained prior to data collection to ensure adherence to research ethics involving student participants.

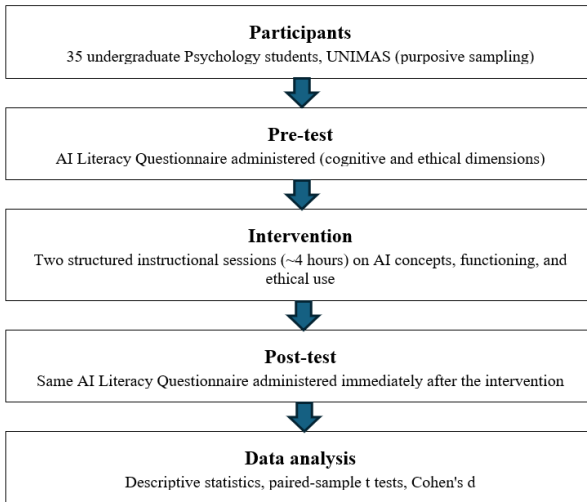
AI literacy was measured using the AI Literacy Questionnaire developed and validated by Ng et al. (2024). In line with the objectives of the study, only the cognitive and ethical dimensions of the instrument were administered. All items were rated on a Likert-type scale, with higher scores indicating higher levels of AI literacy. Previous validation studies have reported satisfactory reliability and construct validity for these dimensions.

The intervention consisted of a two structured instructional session delivered over approximately four hours. The session introduced core AI concepts and ethical considerations relevant to psychology students. Content included an overview of artificial intelligence and commonly used AI tools in academic contexts, a conceptual explanation of how AI systems function and the role of data, practical demonstrations of AI use for academic writing and research support in psychology, and guided discussion on ethical and responsible AI use focusing on bias, privacy, academic integrity, and professional ethics.

Participants completed the AI Literacy Questionnaire as a pre-test prior to the intervention. The same instrument was administered as a post-test immediately after the completion of the instructional session. Data were analysed using descriptive statistics to summarise AI literacy levels before and after the intervention. Paired-sample *t* tests were conducted to examine differences between pre-test and post-test scores, and effect sizes were calculated using Cohen's *d* to determine the magnitude of the intervention effects.

Figure 1:

Brief Methodological flow chart



RESULTS

This study examined changes in cognitive and ethical AI literacy among Psychology undergraduate students following a single-session instructional intervention. Overall, the findings indicate a substantial improvement in both dimensions of AI literacy after the intervention, suggesting that even brief, well-structured instruction can meaningfully enhance students' understanding and ethical awareness of AI.

Descriptive statistics revealed a marked increase in cognitive AI literacy scores from pre-test to post-test. As shown in Table 1, the mean cognitive AI literacy score increased from 3.02 (SD = 0.41) to 4.23 (SD = 0.37). Paired-sample *t* test analysis confirmed that this improvement was statistically significant, $t(34) = 15.27$, $p < .001$, with a large effect size (Cohen's $d = 2.58$) (Table 2).

Table 1

Descriptive Statistics for AI Literacy Scores (N = 35)

Variable	Pre-test Mean	Pre-test SD	Post-test Mean	Post-test SD
Cognitive AI Literacy	3.02	0.41	4.23	0.37
Ethical AI Literacy	2.81	0.49	3.92	0.44

Table 2

*Paired-Sample *t* test Results for AI Literacy Scores (N = 35)*

Variable	<i>t</i> (34)	<i>p</i>	Cohen's <i>d</i>
Cognitive AI Literacy	15.27	< .001	2.58
Ethical AI Literacy	17.84	< .001	3.02

Similarly, ethical AI literacy scores showed a substantial increase following the intervention. The mean score rose from 2.81 (SD = 0.49) at pre-test to 3.92 (SD = 0.44) at post-test. This improvement was statistically significant, $t(34) = 17.84$, $p < .001$, with a very large effect size (Cohen's $d = 3.02$).

DISCUSSION

This finding aligns with previous studies demonstrating that explicit instruction can clarify AI concepts for students in non-technical disciplines (Butt et al., 2025; Mansoor et al., 2024). For psychology students, exposure to foundational AI concepts and practical demonstrations appears to have enhanced their ability to understand how AI tools function and how they may be applied to academic and learning tasks. The large effect size suggests that the intervention was highly effective despite its single-session format, supporting the pedagogical value of concise, focused AI literacy instruction. The significant improvement in ethical AI literacy is particularly important in psychology education, where ethical reasoning, professional responsibility, and awareness of bias are essential competencies. The guided discussion on issues such as academic integrity, data privacy, and algorithmic bias likely contributed to students' heightened ethical awareness. This finding is consistent with prior research highlighting the importance of explicit ethical framing when introducing generative AI tools in educational settings (Bearman et al., 2022; Chiu, 2023).

This study has several limitations that should be considered when interpreting the findings. First, the one-group pre-test–post-test design lacked a control or comparison group, meaning that observed improvements cannot be fully attributed to the intervention alone and may partly reflect testing effects, maturation, or the novelty of the session. Second, AI literacy was assessed immediately after the intervention only, so the durability and long-term retention of the observed gains remain unknown. Third, the sample consisted of 35 psychology undergraduates recruited through purposive sampling at a single university, which limits the generalisability of the findings to other institutions or disciplines. Fourth, AI literacy was measured using self-report data, which may be subject to social desirability bias. Future research should employ randomised controlled or quasi-experimental designs with comparison groups, follow-up assessments, and larger, more diverse samples to address these limitations.

CONCLUSION

This study demonstrated that a structured, single-session AI literacy intervention significantly improved both cognitive and ethical AI literacy among Psychology undergraduate students at Universiti Malaysia Sarawak. The findings indicate that psychology students, when provided with targeted instruction and contextualised examples, can rapidly develop a clearer conceptual understanding of AI and a stronger awareness of ethical considerations. These results contribute to the growing body of scholarship of teaching and learning research by providing empirical evidence that brief, discipline-specific interventions can yield substantial educational benefits. The findings have several important implications for psychology education and higher education more broadly. At the instructional level, the results suggest that AI literacy should be intentionally integrated into psychology curricula, particularly in courses involving research methods, assessment, and academic writing. Emphasising ethical reasoning alongside technical understanding is especially critical given psychology's professional and ethical standards.

At the institutional level, universities may consider offering short, scalable AI literacy modules or workshops that can be embedded within existing courses or delivered as co-curricular learning experiences. Such initiatives align with national and global priorities related to digital competence, ethical technology use, and Sustainable Development Goal 4, which advocates inclusive and high-quality education for all learners. Based on the findings, it is recommended that psychology educators incorporate explicit instruction on AI concepts and ethics into undergraduate programmes using concise and contextually relevant formats. Future research should explore the long-term retention of AI literacy gains and examine how repeated or scaffolded interventions influence students' critical engagement with AI over time. Additionally, mixed-method studies incorporating qualitative data could provide deeper insight into students' perceptions, attitudes, and learning experiences related to AI literacy.

Funding: This research received no external funding.

Informed Consent Statement: Informed consent was obtained from all participants involved in the study. Participation was voluntary, and participants were informed of the purpose of the study and their right to withdraw at any time without penalty.

Declaration of Generative AI: During the preparation of this manuscript, the authors used ChatGPT (OpenAI) solely for language refinement, including improving grammar, clarity, and readability. The authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

Acknowledgments: The authors would like to acknowledge Universiti Malaysia Sarawak (UNIMAS) for the support provided in facilitating this study. The authors also extend their appreciation to all Psychology undergraduate students who participated in the study.

Conflicts of Interest: The authors declare no conflicts of interest.

REFERENCES

1. Bearman, M., Ryan, J., & Ajjawi, R. (2022). Discourses of artificial intelligence in higher education: A critical literature review. *Higher Education*, 86(2), 369-385. <https://doi.org/10.1007/s10734-022-00937-2>
2. Butt, F. S., Malik, A., & Mahmood, K. (2025). Assessing AI literacy of university students in Pakistan: a cross-sectional survey. *Digital Library Perspectives*, 1-18.
3. Chiu, T. K. F. (2023). The impact of generative AI (GenAI) on practices, policies, and research direction in education: A case of ChatGPT and MidJourney. *Interactive Learning Environments*, 32(10), 6187-6203. <https://doi.org/10.1080/10494820.2023.2253861>
4. Eke, D. (2023). ChatGPT and the rise of generative AI: Threat to academic integrity? *Journal of Responsible Technology*, 13, 100060. <https://doi.org/10.1016/j.jrt.2023.100060>
5. Fariani, R. I., Junus, K., & Santoso, H. B. (2023). A systematic literature review on personalised learning in the higher education context. *Tech Know Learn*, 28, 449-476. <https://doi.org/10.1007/s10758-022-09628-4>
6. Farrokhnia, M., Banihashem, S. K., Noroozi, O., & Wals, A. (2023). A SWOT analysis of ChatGPT: Implications for educational practice and research. *Innovations in Education and Teaching International*, 61(3), 460-474. <https://doi.org/10.1080/14703297.2023.2195846>
7. Lodge, J. M., De Barba, P., & Broadbent, J. (2024). Learning with generative artificial intelligence within a network of co-regulation. *Journal of University Teaching and Learning Practice*, 20(7). <https://doi.org/10.53761/1.20.7.02>
8. Long, D., & Magerko, B. (2020). What is AI literacy? Competencies and design considerations. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems* (pp. 1-14). Association for Computing Machinery. <https://doi.org/10.1145/3313831.3376727>
9. Mansoor, H. M., Bawazir, A., Alsabri, M. A., Alharbi, A., & Okela, A. H. (2024). Artificial intelligence literacy among university students: A comparative transnational survey. *Frontiers in Communication*, 9, 1478476. <https://doi.org/10.3389/fcomm.2024.1478476>
10. Mastam, N. M., Mokhtar, K., & Zaharudin, R. (2024). Bridging the digital divide in Malaysia: Enhancing digital literacy for inclusive students in educational systems. *Asia Pacific Journal of Youth Studies*, 15(2), 111-131.
11. Ng, D. T. K., Leung, J. K. L., Chu, S. K. W., & Qiao, M. S. (2021). Conceptualizing AI literacy: An exploratory review. *Computers and Education: Artificial Intelligence*, 2, 100041. <https://doi.org/10.1016/j.caeai.2021.100041>
12. Ng, D. T. K., Wu, W., Leung, J. K. L., Chiu, T. K. F., & Chu, S. K. W. (2024). Design and validation of the AI literacy questionnaire: The affective, behavioural, cognitive and ethical approach. *British Journal of Educational Technology*, 55(3), 1082-1104. <https://doi.org/10.1111/bjet.13411>
13. Su, J., & Yang, W. (2023). AI literacy curriculum and its relation to children's perceptions of robots and attitudes towards engineering and science: An intervention study. *Journal of Computer Assisted Learning*, 40(1), 241-253. <https://doi.org/10.1111/jcal.12867>
14. Tapalova, O., & Zhiyenbayeva, N. (2022). Artificial intelligence in education: AIED for personalised learning pathways. *Electronic Journal of E-Learning*, 20(5), 639-653. <https://doi.org/10.34190/ejel.20.5.2597>
15. Zhai, C., Wibowo, S., & Li, L. D. (2024). The effects of over-reliance on AI dialogue systems on students' cognitive abilities: a systematic review. *Smart Learning Environments*, 11(1), 28.