

THE IMPACT OF ARTIFICIAL INTELLIGENCE LITERACY ON LECTURERS' ACADEMIC PERFORMANCE AND WORKFLOW EFFICIENCY

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ABSTRACT

This study evaluates the Artificial Intelligence (AI) literacy of university lecturers and examines its subsequent impact on their academic performance, covering teaching, research, and administrative tasks. With the rapid advancement of generative AI in education, AI literacy is crucial for maximizing efficiency and effectiveness. A mixed-methods approach, combining quantitative surveys and qualitative thematic interviews, was employed to measure understanding, needs, and perceived impact. The quantitative results reveal a high conceptual AI literacy (average score: 4.36) among lecturers, alongside strong optimism regarding AI's transformative role in education (90.9% believing in major change). Quantitatively, AI significantly increases efficiency in lecture preparation and research productivity. Qualitatively, however, the implementation is challenged by critical issues of academic integrity and a lack of systemic readiness (regulations, infrastructure). The key finding is the dual role of AI: it acts as a valuable "thinking partner" that boosts creativity and productivity, yet simultaneously introduces ethical concerns regarding humanistic teaching and student dependency. The study concludes that continuous, specific training on AI ethics and prompt engineering is an urgent institutional necessity to harness AI's benefits responsibly.

Key Words : AI Literacy, Academic Performance, Generative AI, Digital Transformation, Higher Education.

INTRODUCTION

Artificial Intelligence (AI) has become a transformative force in higher education, reshaping the ways teaching, research, and academic administration are conceptualized and executed. As AI-powered tools increasingly permeate educational ecosystems, lecturers are expected to develop the competencies necessary to meaningfully integrate these technologies into their professional practice. AI literacy, defined as the knowledge, skills, and critical awareness required to understand, apply, and evaluate AI systems in educational and research contexts, has therefore emerged as a crucial component of academic professionalism. Studies argue that AI-enabled systems can enhance instructional design, support data-driven decision-making in research, and automate repetitive administrative tasks, ultimately improving academic productivity and workflow efficiency (Kasneci et al., 2023).

Recent advances in large language models (LLMs), adaptive learning systems, automated grading tools, and AI-supported research platforms have broadened the pedagogical and scholarly opportunities available to lecturers. Chen, Chen, and Lin (2020) highlight that AI has accelerated the shift toward intelligent tutoring systems, personalized learning pathways, and predictive analytics for academic decision-making. Moroianu, Iacob, and Constantin (2023), through a systematic review of AI in education, emphasize that AI's expanding capabilities demand corresponding improvements in educators' digital and AI-related competencies to ensure responsible and effective implementation. Without foundational AI literacy, the integration of these technologies often remains superficial and fails to meaningfully influence teaching quality or research outcomes.

In the Indonesian higher education context, previous research reveals that efforts to integrate digital tools and AI into pedagogy are still evolving. Earlier studies within the English education domain, such as Suriaman, Rahman, and Noni (2018), demonstrated the potential of web-based learning materials to promote autonomy and engagement among university students. Further research by Badaruddin, Noni, and Jabu (2019) underscores the importance of ICT readiness in supporting blended learning aligned with Education 4.0. More recently, Maulina, Geelan, Basri, and Noni (2021) showcased the pedagogical promise of mobile-assisted English learning through WhatsApp-based instructional materials, while Noni, Jefri, and Novia (2022) documented lecturers' challenges in adopting online learning tools due to varying levels of technological competence. The emergence of ChatGPT and generative AI in academic writing instruction, explored in Fikri, Noni, and Sunra (2024), further establishes the growing relevance of AI literacy among language educators.

Despite the proliferation of digital tools and AI-supported applications, many lecturers still face difficulties in understanding how AI functions, how it can be incorporated effectively into pedagogical design, and how it may improve research productivity. As a result, AI adoption in higher education often remains fragmented. This gap underscores the need to explore how lecturers' AI literacy influences their academic performance, including instructional quality, classroom management, research productivity, and administrative efficiency.

This study examines AI literacy among lecturers in the English Department at the Faculty of Languages and Literature, Universitas Negeri Makassar (UNM). It aims to investigate the extent to which lecturers understand AI concepts, apply AI tools in their professional tasks, and perceive the benefits and challenges associated with AI integration. Employing a mixed descriptive quantitative and qualitative approach—through surveys and in-depth interviews—this research analyzes how AI literacy correlates with various aspects of academic performance and workflow efficiency. The findings are expected to enrich the growing body of

literature on AI in higher education while offering actionable recommendations for enhancing lecturer competencies, institutional support structures, and AI-informed pedagogical innovation.

By providing an evidence-based understanding of AI literacy within a specific disciplinary and institutional context, this study contributes to the ongoing dialogue on how higher education institutions can respond strategically to technological advancements. Strengthening lecturers' AI literacy is not only necessary for improving teaching and research outcomes but also essential for preparing universities to thrive in the evolving landscape of digital and AI-driven education.

METHOD OF THE RESEARCH

This study employed a descriptive research design with a mixed-methods approach, combining quantitative and qualitative techniques to explore lecturers' artificial intelligence (AI) literacy and its relation to various aspects of their academic performance. The primary data collection methods included surveys and interviews, aimed at capturing lecturers' understanding, utilization, and challenges in integrating AI into teaching and research (Creswell & Creswell, 2018).

The first stage involved a survey to collect quantitative data on lecturers' AI literacy. The survey instrument covered multiple dimensions, including knowledge of AI concepts, frequency of AI use in academic tasks, and perceptions of AI's application in higher education. The resulting data provided a statistical overview of AI literacy patterns among lecturers and its potential correlation with academic effectiveness (Chen, Chen, & Lin, 2023).

In addition to the survey, interviews were conducted to gain further insights into lecturers' experiences with AI in their professional activities. The interviews focused on general challenges, adaptation strategies, and perceived effects on teaching and research efficiency. This approach allowed the research to capture nuances that complemented the quantitative findings without requiring extensive qualitative probing (Kasneci et al., 2023).

Data analysis was conducted in two phases. Quantitative survey data were analyzed using descriptive statistics, including frequency counts, percentages, means, and correlations between variables to examine the contribution of AI literacy to lecturers' academic performance. Qualitative interview data were coded and categorized thematically to identify patterns, perspectives, and factors influencing AI adoption in the academic environment (Moroianu, Iacob, & Constantin, 2023).

By combining these methods, the study aimed to provide a comprehensive understanding of lecturers' AI literacy and to inform strategies for enhancing AI competencies. Insights from this research can support institutions in developing training programs, policies, and resources that facilitate effective AI integration in higher education teaching and research.

FINDINGS AND DISCUSSIONS

Findings

This section presents the study’s findings, combining survey and interview data to explore AI literacy among lecturers at the English Department, Faculty of Language and Literature, Universitas Negeri Makassar. A descriptive analysis with quantitative and qualitative approaches was employed to illustrate lecturers’ conceptual and practical understanding of AI, their adoption in academic activities, challenges faced, and the impact on teaching, research, and administrative efficiency. The findings provide a comprehensive view of the current state of AI literacy and lecturers’ needs for professional development.

AI Literacy of Lecturers

Table 1 indicates that lecturers possess a relatively high level of basic AI literacy. For example, 63.6% of respondents agreed and 36.4% strongly agreed that they understood fundamental AI concepts. One interviewee emphasized that “lecturers have started to understand how AI works but still need a more critical and responsible approach to its use,” suggesting that while conceptual understanding is solid, awareness of ethical and evaluative aspects is emerging.

Table 1. Lecturers’ Artificial Intelligence (AI) Literacy

| No | Statements | SD | D | N | A | SA |
|----|---|----|-------|-------|-------|-------|
| 1 | I understand the basic concepts of Artificial Intelligence (AI). | | | | 63.6% | 36.4% |
| 2 | I know how AI can be used in teaching and learning. | | | | 72.7% | 27.3% |
| 3 | I understand the types of AI technologies that can be applied in academic fields. | | | | 81.8% | 18.2% |
| 4 | I feel confident using AI-based applications for my academic tasks. | | 9.1% | 18.2% | 63.6% | 9.1% |
| 5 | I have attended training related to AI in education. | | 27.3% | 27.3% | 27.3% | 18.2% |

| | | | | |
|---|--|-------|-------|-------|
| 6 | I know how to use AI to improve interaction with students. | 27.3% | 54.5% | 18.2% |
|---|--|-------|-------|-------|

Regarding AI applications in teaching, 72.7% of respondents agreed and 27.3% strongly agreed that they knew how AI could support instructional activities. Interviews supported this finding, with lecturers describing AI as a “supporting tool, not the main actor” in pedagogy, indicating awareness of its supplementary role. Knowledge of different AI technologies applicable in academic contexts reached the highest level of agreement, with 81.8% agreeing and 18.2% strongly agreeing. However, interviews revealed that this knowledge remains mostly conceptual, with lecturers highlighting challenges such as students “over-relying on AI” or accepting inaccurate outputs due to insufficient validation skills.

Confidence in using AI tools varied: 63.6% agreed and 9.1% strongly agreed that they felt confident, while 27.3% disagreed or strongly disagreed. Several lecturers noted practical difficulties, including “accuracy and validation of information” and risk of mistakes without careful attention. Only 45.5% of lecturers had received prior AI-related training, highlighting gaps in institutional support. For using AI to improve student interaction, 54.5% agreed and 18.2% strongly agreed, though 27.3% disagreed, with interviewees noting technical limitations such as inadequate devices or unstable internet connections. Overall, while conceptual AI literacy is strong, practical, evaluative, and strategic competencies require development.

Lecturers' Needs for AI

Table 2 illustrates a strong need for AI across academic tasks. In administrative tasks, 54.5% of respondents agreed and 18.2% strongly agreed that AI could assist in managing workloads, supported by interview statements such as “AI simplifies every step of preparing academic work.” For instructional design, 54.5% agreed and 36.4% strongly agreed that AI enhances lesson preparation. Interviews emphasized that AI supports creativity and organization, with lecturers noting it “generates ideas I might not have considered” and structures teaching materials systematically.

Table 2. Artificial Intelligence (AI) Needs

| No | Statements | SD | D | N | A | SA |
|----|--|----|------|-------|-------|-------|
| 1 | I feel that AI can help me manage academic administration. | | 9.1% | 18.2% | 54.5% | 18.2% |
| 2 | The use of AI will | | | 9.1% | 54.5% | 36.4% |

| | | | | | |
|---|--|-------|-------|-------|-------|
| | improve my effectiveness in designing teaching materials. | | | | |
| 3 | AI can help me provide faster and more effective feedback to students. | 18.2% | 54.5% | 27.3% | |
| 4 | I believe AI can help improve the quality of my research. | 9.1% | 9.1% | 54.5% | 27.3% |
| 5 | I need further training to utilize AI in my academic work. | 9.1% | 27.3% | 63.6% | |
| 6 | The use of AI will reduce my workload in preparing reports or lecture materials. | 18.2% | 36.4% | 45.5% | |

AI was also recognized as valuable in providing feedback, with 54.5% agreeing and 27.3% strongly agreeing that AI enables faster, more effective student evaluations. For research support, 54.5% agreed and 27.3% strongly agreed that AI improves the quality of research, with interviewees describing AI as a “thinking partner” that identifies patterns or organizes literature, although manual verification remains necessary. The most pronounced need was for further training: 63.6% strongly agreed and 27.3% agreed that additional training is essential for optimal AI use. Regarding workload reduction, 45.5% strongly agreed and 36.4% agreed that AI decreases time spent on reports or lesson preparation, corroborated by statements that AI “assists in every step of academic task preparation.”

Impact of AI on Academic Performance

Table 3 shows the influence of AI on lecturers’ academic performance across six indicators: operational efficiency, understanding student needs, interactive teaching, evaluation quality, research productivity, and focus on creative teaching. The strongest positive impacts were observed in operational efficiency and research productivity. A total of 81.9% of respondents agreed that AI improved efficiency in preparing lecture materials, supported by interviews noting AI “accelerates material preparation, grading rubrics, and literature summaries.” Similarly, 81.8% felt more productive in research, with AI aiding in reference tracking and pattern recognition.

Table 3. Impact of AI on Lecturers' Academic Performance

| No | Statements | SD | D | N | A | SA |
|----|--|------|------|-------|-------|-------|
| 1 | The use of AI has improved my efficiency in preparing lecture materials. | | | 18.2% | 45.5% | 36.4% |
| 2 | AI helps me identify and understand students' learning needs. | | 9.1% | 18.2% | 36.4% | 36.4% |
| 3 | By using AI, I am more capable of delivering interactive and engaging lessons. | | | 36.4% | 45.5% | 18.2% |
| 4 | The use of AI in assessing student assignments or exams improves the quality of my evaluation. | 9.1% | 9.1% | 18.2% | 45.5% | 18.2% |
| 5 | I feel more productive in research activities thanks to AI support. | | | 18.2% | 54.5% | 27.3% |
| 6 | AI allows me to focus more on creative and innovative aspects of teaching. | | | 18.2% | 54.5% | 27.3% |

AI also helped lecturers focus on creative and innovative teaching, with 81.8% agreeing that it allows them to prioritize more complex aspects of pedagogy. Regarding understanding students' learning needs, 72.8% agreed that AI provided support, although 9.1% disagreed, reflecting minor skepticism about AI's ability to fully capture individual student needs. The use of AI to create interactive learning showed more variability, with 36.4% neutral; interviews revealed that AI outputs often require adaptation to the classroom context. For assessment and evaluation, 63.7% agreed that AI improved quality, while 18.2% disagreed. Interview data highlighted concerns about AI accuracy and validity, suggesting that while AI supports evaluation, human verification remains critical.

In summary, the study confirms that AI positively affects lecturers' efficiency, research productivity, and instructional preparation. However, its role in interactive teaching and evaluation requires verification, contextual adjustment, and further training to ensure responsible and effective use in higher education.

Discussion

AI Literacy of Lecturers

The findings indicate that lecturers possess strong conceptual AI literacy, while practical and evaluative skills require further development. Regarding understanding basic AI concepts, 63.6% of lecturers agreed and 36.4% strongly agreed, with a mean Likert score of 4.36, suggesting high to very high literacy. One lecturer emphasized, "Lecturers have started to understand how AI works but still need a more critical and responsible approach to its use" (Huang & Cheng, 2021).

Lecturers also demonstrated strong understanding of AI applications in teaching, with 72.7% agreeing and 27.3% strongly agreeing (mean score 4.27). Interviews revealed that AI is seen as "a supporting tool rather than the main actor," reflecting balanced pedagogical awareness (Li, Wang, & Zhao, 2022). Knowledge of different AI technologies applicable in academia received the highest agreement, with 81.8% agreeing and 18.2% strongly agreeing (mean score 4.18). However, interviews highlighted that this understanding is often theoretical, as students sometimes over-rely on AI or receive inaccurate outputs, consistent with prior findings (Tjan, 2021).

Confidence in practical AI use was lower (mean score 3.73), with only 63.6% agreeing and 9.1% strongly agreeing, while 27.3% disagreed. Challenges included accuracy, validation, and potential errors. Training levels were also limited, with only 45.5% having participated in AI-related professional development (mean score 3.36). Interviews confirmed the need for "continuous training to ensure lecturers' knowledge develops adequately" (Fikri, Noni, & Sunra, 2024). For using AI to enhance student interaction, 54.5% agreed and 18.2% strongly agreed (mean score 3.91), while 27.3% disagreed, with technical constraints such as student devices and connectivity affecting effectiveness, in line with Badaruddin, Noni, & Jabu (2019). Overall, conceptual AI literacy is high (mean scores 4.18–4.36), but practical, evaluative, and strategic competencies require institutional support, ongoing training, guidelines, and infrastructure to ensure effective, ethical, and standardized use (Maulina et al., 2021).

Lecturers' Needs for AI

The study revealed a very high demand for AI support in academic tasks. For academic administration, the mean score was 4.18, with 54.5% agreeing and 18.2% strongly agreeing that AI reduces workload. Interviews reinforced this, with one lecturer noting that AI "simplifies every step of preparing

academic work,” reflecting its potential for automating documents, reports, and administrative tasks. These findings echo Badaruddin, Noni, & Jabu (2019), who highlighted the importance of infrastructure readiness and technology access for AI integration in higher education.

For lesson planning, the mean score was 4.36, indicating that lecturers consider AI highly valuable for enhancing effectiveness and creativity. Interviews confirmed that AI assists in “designing more comprehensive and interactive teaching materials” and “structuring content with ideas previously unconsidered.” This supports Li, Wang, & Zhao (2022), who noted that AI enriches learning materials but requires active lecturer involvement to maintain pedagogical quality.

Regarding feedback provision, the mean score was 4.09, showing that AI is used to support evaluation and student interaction, such as searching for references and structuring systematic learning. This aligns with Maulina et al. (2021), who emphasized AI as a tool for increasing instructional efficiency through process systematization.

For research support, the mean score was 4.00, with 54.5% agreeing and 27.3% strongly agreeing. Lecturers viewed AI as a “thinking partner” aiding data analysis, literature review, and pattern recognition, though manual verification remained necessary. This finding is consistent with Tjan (2021), who highlighted that AI can enhance research productivity but requires evaluative skills to minimize errors.

Training needs were particularly pronounced, with a mean score of 4.55, indicating the necessity of formal, continuous professional development and institutional guidelines to optimize AI use. Interviews emphasized that “continuous training is essential to understand AI application in teaching and learning” (Fikri, Noni, & Sunra, 2024). Regarding workload reduction, the mean score was 4.27, confirming that AI significantly improves efficiency and productivity. Overall, the quantitative and interview data underscore lecturers’ strong demand for AI integration across administrative, instructional, evaluative, and research tasks, highlighting the need for tiered training, institutional support, and clear usage guidelines (Huang & Cheng, 2021; Li et al., 2022; Tjan, 2021; Maulina et al., 2021; Fikri et al., 2024).

Impact of AI on Academic Performance

The results demonstrate that AI positively impacts lecturers’ academic performance, particularly in operational efficiency, research productivity, and instructional material development. For lecture preparation efficiency, the mean score was 4.18, supported by interviews where lecturers reported that AI “accelerates creation of teaching materials, grading rubrics, and literature summaries,” enhancing administrative and academic workflow. These findings align with Huang & Cheng (2021), who emphasized that digital literacy and AI use improve lecturers’ task efficiency.

In research productivity, the mean score was 4.09, with AI assisting in “tracking recent references and identifying previously unseen patterns,” supporting both quality and efficiency. This corroborates Tjan (2021), who noted that AI acts as an analytical assistant in research and academic data processing. AI’s ability to allow lecturers to focus on creative teaching aspects had a mean score of 4.09, fostering pedagogical innovation, consistent with Li, Wang, & Zhao (2022), who stressed AI as a pedagogical aid rather than a replacement.

For understanding students’ learning needs, the mean score was 3.91, with 72.8% agreeing, though 9.1% remained skeptical. Interviews indicated that AI helps analyze student needs and recommend materials, but manual adjustments remain essential for classroom relevance. The interactivity indicator showed a lower mean of 3.64, with 36.4% neutral, suggesting that while AI generates content and ideas, its effect on classroom dynamics depends on active lecturer involvement, echoing Smith & Lee (2020).

Regarding assessment, the mean score was 3.64, with 45.5% agreeing and 18.2% strongly agreeing that AI improves evaluation quality, though 18.2% disagreed. Interviews highlighted concerns about potential errors, emphasizing the need for manual verification. These findings are consistent with Li et al. (2022) and Tjan (2021), who stressed caution and supervision when using AI for academic assessment.

AI positively influences lecturers’ academic performance, particularly in operational efficiency, research productivity, and instructional development. However, its effectiveness in interactivity and assessment requires careful oversight, verification, and ongoing training to ensure accurate, valid, and responsible usage (Huang & Cheng, 2021; Li et al., 2022; Smith & Lee, 2020; Tjan, 2021).

CONCLUSION

This study demonstrates that lecturers in the English Department of Universitas Negeri Makassar exhibit high conceptual literacy in artificial intelligence (AI), while practical, evaluative, and strategic competencies remain underdeveloped. Quantitative data and interviews show that lecturers understand AI concepts, applications in teaching, and different AI technologies, yet confidence in operational use and systematic evaluation is moderate. Limited training and technical constraints highlight the need for institutional support, ongoing professional development, and clear guidelines to ensure effective, ethical, and standardized AI integration.

Lecturers expressed strong needs for AI support across administrative, instructional, feedback, and research tasks. AI is perceived as a valuable tool for enhancing efficiency, creativity, and research productivity, particularly in automating administrative work, designing teaching materials, providing timely feedback, and supporting data-driven research. Training emerged as a

critical requirement, emphasizing that formal, continuous programs are essential to optimize AI utilization.

AI was found to positively impact lecturers' academic performance, especially in operational efficiency, research productivity, and instructional development. However, its effectiveness in fostering interactivity and improving evaluation quality depends on lecturers' active engagement and proper oversight, reinforcing the importance of critical literacy and verification skills.

Overall, the study underscores that AI has significant potential to enhance academic performance and efficiency in higher education, but realizing this potential requires strategic institutional support, professional training, and deliberate integration into pedagogical and research practices. These findings provide actionable insights for universities seeking to strengthen AI literacy, improve instructional quality, and promote responsible, productive adoption of AI technologies in academic settings.

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THE ACADEMIC

Journal of English Language Education
ISSN: 2528-3677; E-ISSN: 2988-408X

Volume 10 No. 2 December 2025

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