

Artificial Intelligence for Educ-AI-tion: AI Integration on Scientific Writing Strategies in Lecturer Training Programs

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ABSTRACT

The use of artificial intelligence (AI) in the context of education has become an increasingly relevant topic in the modern era. This study aims to explore the integration of AI into lecturer training programs at Universitas Muhammadiyah Enrekang, focusing on the development of effective scientific writing strategies. A qualitative approach with a case study design is employed in this research, involving interviews with lecturers and training instructors, observation during training sessions, and analysis of relevant training program documents. The findings highlight the need for AI integration in the development of scientific writing skills, as well as various strategies that can be implemented in training programs. Challenges and opportunities related to this integration are also identified. This study contributes to understanding the importance of AI usage in education and the professional development of lecturers, particularly at Universitas Muhammadiyah Enrekang.

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Introduction

Technological developments, especially artificial intelligence (AI), have brought major transformations in various aspects of human life, including in the field of education. AI has become an irreplaceable partner in helping to improve the effectiveness of the learning and teaching process. With its ability to quickly analyze data, detect patterns, and provide informed recommendations, AI enables better personalization of education according to individual needs. In addition, the integration of AI in education also opens the door to the development of various

new, innovative, and interactive learning tools, which can help students understand complex concepts more interestingly and efficiently (Muhie et al., 2023).

Effective scientific writing is the main foundation of academic success in a university environment. Good writing strategies not only ensure the presentation of ideas and findings clearly, but also increase the credibility and impact of scientific work (Bitsch, 2014; Graham & Harris, 2014). In today's digital information era, where access to resources is widespread, effective

scientific communication has become increasingly important. Therefore, developing effective scientific writing strategies is a major concern in efforts to improve the quality of education and research in the academic environment (Derish et al., 2007; Shiohira, 2021).

Universitas Muhammadiyah Enrekang, located in Enrekaeng Regency, Indonesia, has an important role in advancing education and research in the area. As a higher education institution committed to making a positive contribution to society, this university is the right place to research the integration of AI in teaching and learning, especially in the context of developing scientific writing skills. With a diverse lecturer, Universitas Muhammadiyah Enrekang offers a strong foundation for exploring the implementation of AI technology in the context of writing scientific articles.

Conventional approaches to teaching scientific writing are often based on methods that focus on established grammatical rules and text structures. Typically, this includes learning about essay format, organizing ideas, and argumentation techniques. However, this approach tends to limit creativity and flexibility in expressing ideas, because it places more emphasis on assessing formality and grammatical correctness.

Although the conventional approach has become the basis for teaching scientific writing, this approach also has several challenges and obstacles. One of them is difficulty in developing strong writing skills, especially when they are faced with rigid and formal writing assignments. In addition, the subjective nature of the assessment process and the lack of in-depth feedback often become obstacles in helping lecturers improve their writing skills. Other challenges include the need to develop content that

is relevant and appropriate to current developments, as well as the lack of technology integration that can facilitate more effective and interactive writing learning.

It cannot be denied that for most people, writing scientific papers is not an easy task (Nelson, 1990; Turbek et al., 2016). The process of compiling ideas into systematic and scientific writing often requires time, dedication, and a deep understanding of the subject being discussed (Graham & Harris, 2014). Apart from that, scientific writing assignments also require clarity in conveying information, accuracy of data, and the ability to compose strong and well-documented arguments (Day & Gastel, 2012). For many individuals, these challenges can be a significant barrier to effectively expressing their ideas and findings through scientific writing. Therefore, it is important to recognize the complexities and challenges involved in the process of writing scientific papers and develop appropriate strategies and approaches to overcome them.

Therefore, in facing the role of AI in scientific writing, we must be ready to accept this new era with an open attitude (Baker et al., 2019; Majid & Lakshmi, 2022). Researchers do not need to have a deep understanding of the mathematical principles underlying statistical models; instead, they must be able to apply statistical formulas well. The same goes for scientists who don't need to feel inferior because they don't understand the details of AI algorithms; importantly, they must be able to use AI tools effectively (Chen, 2023).

In the context of the lecturer training program at Universitas Muhammadiyah Enrekang, the integration of artificial intelligence (AI) in scientific writing strategies is becoming increasingly important. The lecturer training

program aims to improve the quality of teaching and research of teachers, including developing scientific writing skills. By implementing AI in this program, it is hoped that lecturers can receive effective support in improving the quality of their scientific writing, both in terms of grammar, appropriateness of writing style, and scientific substance. This will have a direct impact on improving the quality of their scientific publications as well as increasing the reputation of Universitas Muhammadiyah Enrekang as an educational institution committed to quality academic development. Thus, the integration of AI in lecturer training programs not only supports the individual development of lecturers but also contributes to the academic progress of the institution as a whole.

Artificial Intelligence (AI) has become an important subject in the transformation of modern education (Chiu & Chai, 2020; Zia-ud-Din et al., 2023). With its ability to process big data quickly and perform tasks that require human thinking, AI has been applied in various aspects of learning (Chatterjee & Bhattacharjee, 2020; Kuleto et al., 2021; Yang & Bai, 2020), including scientific writing. AI applications in education include tools (Singh & Mayer, 2014) for grammar checks, idea generators, and information search aides, all of which can improve the effectiveness and efficiency of the writing process.

AI has great potential to support the development of effective scientific writing strategies by providing tools that assist at every stage of the writing process (Cope et al., 2021). For example, AI can help in generating ideas by analyzing existing data or text, identifying patterns, and offering relevant suggestions. Additionally, AI can also assist in editing and revision, by providing quick and precise grammar

and style feedback (Chen, 2023).

The use of AI in scientific writing provides several significant advantages, including improved quality and efficiency. With the help of AI, writers can reduce grammatical errors, improve sentence structure, and improve the clarity and cohesion of their writing. Additionally, AI can also help save time by providing relevant suggestions instantly, allowing writers to focus on developing core ideas and strong arguments. Thus, the use of AI in scientific writing can bring great benefits to writers in improving the quality and efficiency of their scientific work.

Although there has been research examining the use of artificial intelligence (AI) in education as well as effective scientific writing strategies, research that specifically explores the integration of these two things in the context of lecturer training programs at Universitas Muhammadiyah Enrekang is still limited. Previous research has tended to focus on the use of AI in student learning or on scientific writing strategies more generally, without considering the specific context of faculty training in particular academic settings. Therefore, this research focuses on how AI can be integrated into lecturer training programs with a focus on developing effective scientific writing strategies at Universitas Muhammadiyah Enrekang. Thus, this research will fill this knowledge gap by investigating the use of AI in supporting the development of scientific writing skills at the lecturer level, which is relevant for academic contexts, especially at Universitas Muhammadiyah Enrekang.

This research aims to achieve several goals relevant to the integration of artificial intelligence (AI) in the lecturer training program at Universitas Muhammadiyah Enrekang. First, this research aims to identify the need for the

integration of AI with scientific paper writing skills in the lecturer training program at Universitas Muhammadiyah Enrekang. Second, this research will explore various effective scientific writing strategies that can be applied in lecturer training programs at Universitas Muhammadiyah Enrekang. Third, this research also aims to understand the challenges and opportunities associated with the integration of AI in the development of scientific writing skills at Universitas Muhammadiyah Enrekang. Thus, the aim of this research covers important aspects that will provide a comprehensive understanding of the importance and implications of the use of AI in the context of education and the professional development of lecturers.

Methodology

As outlined in this context, the background has delved into aspects concerning the utilization of artificial intelligence systems in education, along with the associated advantages, benefits, challenges, and limitations. Nonetheless, it's crucial to highlight the absence of research focusing on the needs, strategies, challenges, and opportunities regarding these issues, particularly because there's a lack of studies targeting lecturers at Universitas Muhammadiyah Enrekang. To bridge these gaps in specialized literature, this article aims to present findings from broader research conducted among lecturers at the Faculty of Teacher Training and Education at Universitas Muhammadiyah Enrekang.

This research will use a qualitative approach with a case study as the main design. This approach allows researchers to gain an in-depth understanding of the needs, strategies, challenges, and opportunities related to the integration of artificial intelligence in the development of scientific writing

skills at Universitas Muhammadiyah Enrekang.

Research participants will consist of lecturers at Muhammadiyah University Enrekang who are involved in the lecturer training program. The selection of participants will be carried out purposively, by selecting those who have relevant experience and knowledge in the fields of scientific writing skills and the integration of technology in education.

Data will be collected through several techniques, including (1) Interviews. Interviews will be conducted with lecturers and training instructors to gain an in-depth understanding of the needs, strategies, challenges and opportunities related to the integration of AI in the development of scientific writing skills; (2) Observation, Observations will be carried out during lecturer training sessions to gain direct insight into the implementation of existing scientific writing strategies and the potential for AI integration; (3) Document Analysis, Documents related to lecturer training programs, training materials and relevant literature will be analyzed to complete an understanding of the context and needs.

The qualitative data collected will be analyzed using a thematic analysis approach. Analysis steps include coding, grouping, and thematic interpretation to identify patterns, main findings, and challenges and opportunities that emerge from the data.

The research will be conducted by the principles of research ethics, including confidentiality, anonymity, and participant consent. Ethical approval will be obtained before data collection occurs.

Result and Discussion

3.1. Integration of AI with scientific

writing skills

The need for integration of artificial intelligence (AI) with scientific writing skills in the lecturer training program at Muhammadiyah University Enrekang based on observation results is as follows.

1) Increased Efficiency

AI integration can help increase efficiency in the process of writing scientific papers. With the adoption of AI technology, lecturers can utilize automation tools to carry out data analysis and drafting which allows them to focus more on the content and quality of writing.

2) Personalization of Learning

Lecturers can utilize AI to provide more personal and specific feedback to students in developing scientific writing skills. The AI system can analyze students' written work individually and provide suggestions for improvements tailored to their individual needs and ability levels.

3) Effective Use of Resources

With the help of AI technology, lecturers can carry out more efficient and relevant literature searches to support writing scientific papers. The use of automated literature search tools and text analysis can help lecturers find relevant resources more quickly and accurately.

4) Improved Writing Quality

AI integration can help improve the quality of scientific writing produced by lecturers and students. With the adoption of AI tools such as automatic grammar editors or content recommendation systems, lecturers can ensure that their writing meets good grammar standards and obtain feedback that enriches the content of the writing.

5) Digital Skills Development

Training lecturers in the use of AI for scientific writing skills can help in developing their digital skills. This is important considering the importance of digital literacy in higher education today and increasing the competitiveness of lecturers in the information technology era.

The integration of AI with scientific writing skills in the lecturer training program at Muhammadiyah University Enrekang will not only help improve the efficiency and quality of scientific work but also support the development of lecturers' skills in writing quality scientific papers.

Results of interviews with several lecturers regarding the integration of artificial intelligence in scientific writing skills training. In this interview, they share their views and experiences about the main needs as lecturers in the integration of artificial intelligence, as well as the role this technology plays in meeting these needs. The following are the results of interviews with several lecturers.

Table 1. Need for integration of AI with scientific writing skills

ISSUE	RESPONDENT	INTERVIEW DATA
<i>The need to integrate artificial intelligence in writing scientific papers/articles</i>	R1-EL	<i>"As a lecturer, my main need is efficiency in writing scientific papers. Often, we have a lot of tasks or workloads that must be carried out, which takes a lot of time. With the integration of artificial intelligence, we can reduce the workload, especially in writing scientific papers, so that we can focus on deeper interactions with</i>

students in the teaching/education process."

<i>The role of artificial intelligence in meeting the need for writing scientific papers/articles</i>	R2-IT	<i>"We need a tool or application that can help us identify needs in scientific writing skills. With this application, the implementation of the tridharma, especially in the research field, can be more effective, and the teaching process with students can run well.</i>
	R1-EL	<i>"I see artificial intelligence as a tool that can help us write scientific papers faster. With AI systems, it helps us write initial drafts of scientific papers.</i>
	R3-UM	<i>"Artificial intelligence can help us write scientific papers more effectively, improving the overall quality of scientific work.</i>

Note: R (Respondent). For example, R1 represents interview data from Respondent One; EL represents Respondent's Acronym

Based on interview data obtained from respondents, there are similar views regarding the need and role of artificial intelligence in writing scientific papers. Respondent R1-EL emphasized the need for efficiency in writing scientific papers as a lecturer. The integration of artificial intelligence is expected to reduce workload and allow focus on deeper interactions with students. This finding is in line with R2-IT's opinion which highlights the need for tools or applications that can help identify needs in scientific writing skills so that the implementation of the *tridharma* can be more effective.

Meanwhile, in the context of the role of artificial intelligence, R1-EL and R3-SR emphasize the ability of artificial intelligence to increase the effectiveness and quality of writing scientific papers. R1-EL sees artificial intelligence as a tool for writing initial drafts of scientific papers more quickly, while R3-SR emphasizes that artificial intelligence can improve the overall quality of scientific work.

This discussion illustrates that the integration of artificial intelligence in writing scientific papers can not only provide efficiency in the writing process but also has the potential to improve the quality and effectiveness of scientific

work as a whole. This finding is in line with previous studies which show that the use of artificial intelligence technology in higher education can increase the efficiency and effectiveness of learning and produce higher quality scientific work (Francesc Pedró, 2022; Hutson et al., 2022; Majid & Lakshmi, 2022).

2. Scientific writing strategies applied in the training program

Based on document analysis regarding lecturer training programs and training materials in the integration of artificial intelligence (AI) with scientific writing skills at Universitas Muhammadiyah Enrekang, several key topics are the focus. The following is a summary and development:

1) Introduction to Artificial Intelligence in Scientific Writing

The training materials provide a comprehensive introduction to the concepts and applications of artificial intelligence in the context of writing scientific papers. This includes understanding how AI can be used to support the writing process, from generating initial ideas to final editing.

2) Relevant Artificial Intelligence Applications and Tools

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The training program discusses various applications and artificial intelligence tools that are relevant in supporting the writing of scientific papers. These include algorithms such as ChatGPT, CopyAI, Perplexity, GPTZero, Mendeley, Deepl Translator, QuillBot, Hemingway Editor, and other applications that can assist in drafting, literary analysis, and writing editing.

3) Artificial Intelligence Integration Strategy in writing scientific papers

In the training material, various practical strategies for integrating artificial intelligence in writing scientific papers are explained. This includes instruction on using various AI tools, grammar editors, and translation and data analysis techniques to strengthen arguments in writing. This process involves concrete steps, where lecturers are asked to write scientific articles according to the selected journal template. During the writing process, they use generative AI such as ChatGPT and similar applications to generate manuscripts. After that, a peer review stage is carried out, where the writings are evaluated by fellow lecturers to provide support for the arguments put forward in the writing. Thus, the training materials not only provide theoretical guidance but also facilitate the practical application of these concepts in the

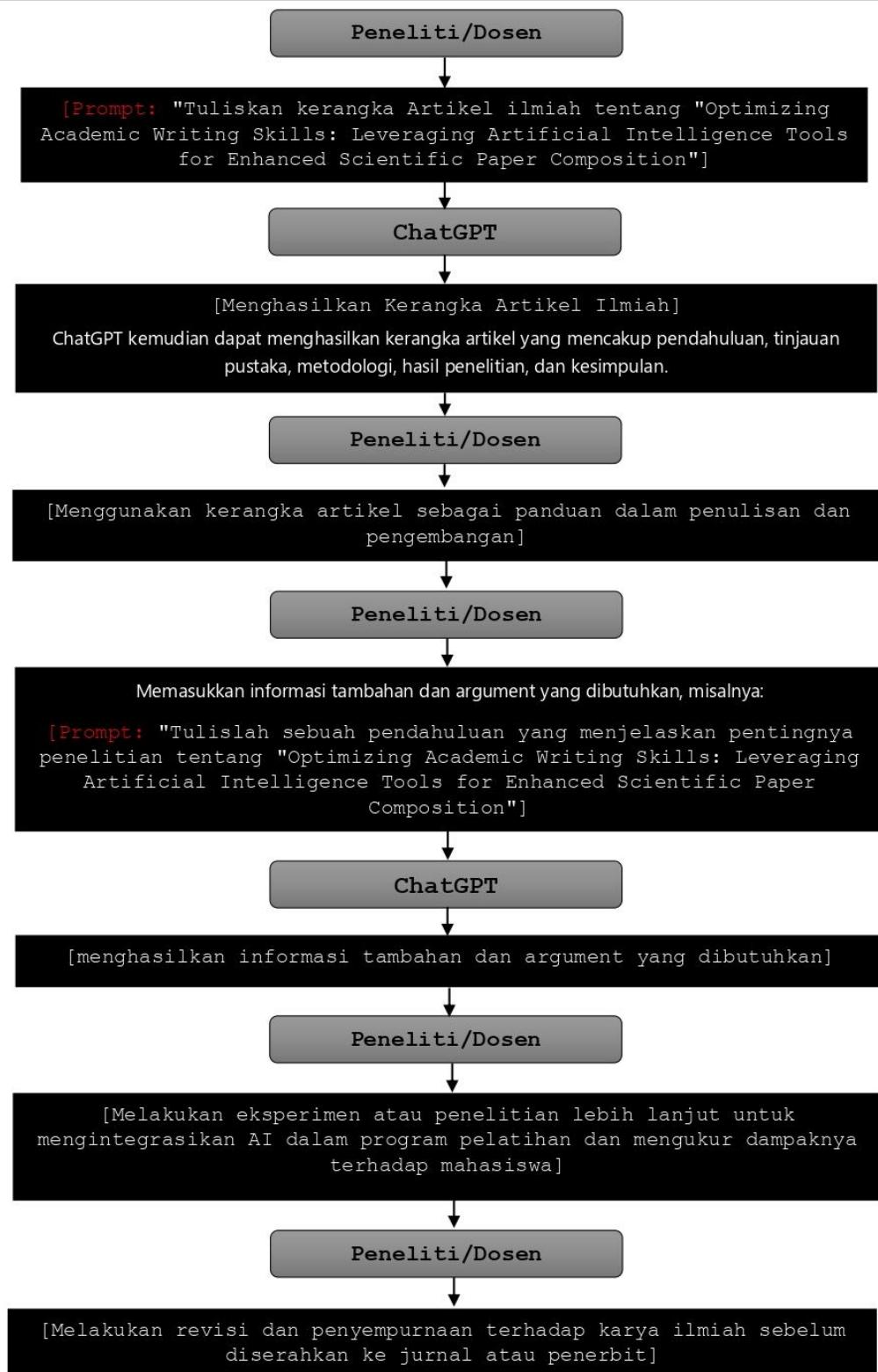
context of scientific writing.

4) Practical Examples and Illustrations

The training program provides concrete examples and clear illustrations of how artificial intelligence can be applied in the practice of writing scientific papers. This helps participants understand concepts in more depth and see direct applications of AI technology in the writing process.

By providing training materials that cover these key topics, the lecturer training program at Universitas Muhammadiyah Enrekang can ensure that participants gain a solid understanding of the integration of artificial intelligence in scientific writing. Likewise, participants were able to apply it effectively in practice. Figure 2 is the process of using ChatGPT in Writing Scientific Papers.

In Figure 2, researchers use ChatGPT to assist in formulating the need for the integration of artificial intelligence in the development of scientific writing skills in educational environments. The findings produced by ChatGPT are used as a basis for designing a scientific writing skills training program integrated with AI. Next, the researchers continued by conducting further experiments or research to integrate AI into the training program and measure its impact on students.

**Figure 1** Process of Using ChatGPT in Writing Scientific Papers

In the process of writing scientific papers, using ChatGPT can be a very useful tool for writers to generate initial ideas, develop an article outline, and

even produce certain parts of the writing. The following is an example of how a writer can use ChatGPT in various stages of writing a scientific paper:

1) Idea Generation and Article Outline

A writer who wants to write a scientific paper can start by providing a topic or outline to ChatGPT. For example, the author wants to write about "Optimizing Academic Writing Skills: Leveraging Artificial Intelligence Tools for Enhanced Scientific Paper Composition". Writers can give prompts such as "Write an article outline that discusses "Optimizing Academic Writing Skills: Leveraging Artificial Intelligence Tools for Enhanced Scientific Paper Composition." ChatGPT can then produce an article outline that includes an introduction, literature review, methodology, research results, and conclusion.

2) Development of Certain Parts of the Article

During the writing process, the writer may experience rigidity in arranging some parts of the article. For example, writers may find it difficult to formulate a problem statement or an interesting introduction. In this case, writers can use ChatGPT to help produce

appropriate paragraph or sentence starters. By providing prompts such as "Write an introduction explaining the importance of research on "Optimizing Academic Writing Skills: Leveraging Artificial Intelligence Tools for Enhanced Scientific Paper Composition", ChatGPT can provide stimulation to start writing.

3) Idea Development and Argumentation

ChatGPT can also be used to help develop ideas and arguments in scientific articles. For example, if the writer needs more information or examples to support his argument, he can provide a prompt such as "Give me an example of the benefits of academic writing skills." ChatGPT can provide additional information or examples that writers can use to strengthen arguments in their writing.

By using ChatGPT in the process of writing scientific papers, authors can save time and effort in producing cohesive and informative manuscripts. However, it is important to always edit and review the results produced by ChatGPT to ensure they suit your needs and the quality of the final post.

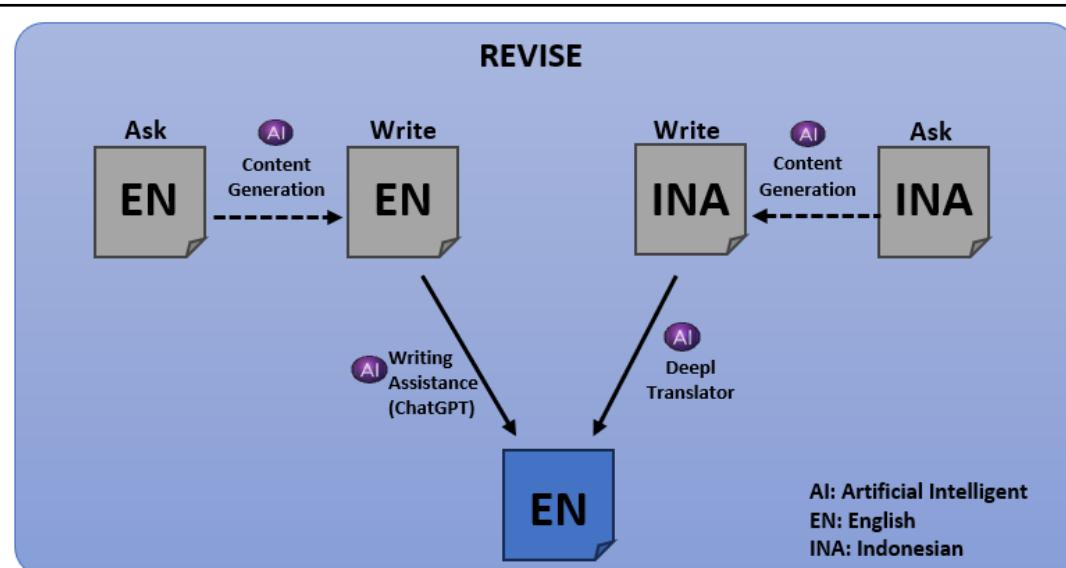


Figure 2 illustrates the utilization of artificial intelligence applications in scientific writing

Once you understand the previous paragraph thoroughly, you have entered a domain influenced by artificial intelligence (AI). Originally drafted in Indonesian, this text was then translated into English using AI-based tools. Next, after a manual review process, the text undergoes further refinement with the help of AI tools. This illustrates how AI technology not only facilitates text translation but also becomes a crucial aspect in the editing and proofreading process in the realm of scientific writing. Experimentally, the original Indonesian text in this article was first compiled briefly by ChatGPT and then translated

into English using DeepL Translator as illustrated in figure 2.

By providing training materials that cover these key topics, the lecturer training program at Muhammadiyah University Enrekang shows its commitment to preparing participants with a comprehensive understanding of the integration of artificial intelligence in writing scientific papers. Based on the results of interviews, show that project-based training strategies are used to support the application of scientific writing skills, where lecturers are given scientific writing projects that are relevant to their field.

Table 2. Scientific writing strategies applied in the training program

ISSUE	RESPONDENT	INTERVIEW DATA
Scientific writing strategies in training programs	Instructor	<i>"In this lecturer training program, we use a project-based learning approach to teach scientific writing skills. Lecturers are given scientific writing projects that are relevant to their fields, and they must compose comprehensive scientific articles based on their research."</i>
	Instructor	<i>"We use several AI applications in the process of writing scientific papers such as ChatGPT, CopyAI, Perplexity, GPTZero, Mendeley, Deep Translator, QuillBot, Hemingway Editor, and several other applications."</i>
Artificial intelligence can complement scientific writing strategies	Instructor	<i>"I believe artificial intelligence can be used to provide faster and more detailed feedback to lecturers during the process of writing scientific papers. AI systems can analyze their drafts automatically and provide specific suggestions for improvement, thereby helping lecturers improve the quality of their scientific work."</i>
	R4-SR	<i>Artificial intelligence technology can provide additional assistance to lecturers in identifying appropriate solutions and developing strong arguments in writing scientific papers. With the help of AI, they can more efficiently carry out literature searches such as Google Scholar and analyze data that supports the arguments they put forward.</i>

Based on the interview data obtained, it can be concluded that the use of project-based learning strategies and AI applications in the process of writing scientific papers is the main focus of lecturer training. Instructors stated that they use a project-based learning approach where lecturers are given scientific writing projects that are relevant to their field. This shows that this approach has become an integral

part of the training strategy for teaching scientific writing skills to lecturers.

Apart from that, the instructor also mentioned the use of various AI applications in the scientific writing training process, such as ChatGPT, CopyAI, Perplexity, GPTZero, Mendeley, Deep Translator, QuillBot, Hemingway Editor, and several other applications. This shows that the use of artificial intelligence technology has been widely

adopted in supporting the scientific writing process.

Both respondents also agreed that artificial intelligence could complement scientific writing strategies by providing fast and detailed feedback to lecturers during the writing process. They also agreed that AI can help in identifying appropriate solutions, developing strong arguments, and conducting supporting literature searches and data analysis. Thus, project-based learning strategies and the use of AI applications are two key components in lecturer training to improve their scientific writing skills, as

well as in enriching and complementing existing scientific writing strategies.

3. Challenges and opportunities for integrating AI in developing scientific writing skills

Based on findings from interviews with various respondents, there are several challenges faced in developing scientific writing skills in an educational environment, as well as potential challenges that may arise when integrating artificial intelligence.

Table 3. Challenges and opportunities for integrating AI in developing scientific writing skills

ISSUE	RESPONDENT	INTERVIEW DATA
Challenges faced in developing scientific writing skills in an educational environment	Instructor	<i>"One of the main challenges we found was a gap in scientific writing skills among lecturers. Some lecturers may already have a strong foundation, while others may need more guidance and support."</i>
	R6-AC	<i>"The challenge I face is the limited time to write scientific papers. Often, the number of students who have to face and provide feedback is very large, making it difficult to pay enough attention to writing scientific papers."</i>
	R7-AS	<i>"One of the challenges I encountered was limited access to relevant scientific resources and literature when using Application AI in writing scientific paper manuscripts. Sometimes, manuscripts produced by AI are not accompanied by strong references."</i>
Another potential challenge when integrating artificial intelligence	Instructor	<i>"I am concerned that the use of artificial intelligence in the development of scientific writing skills may not fully address the gap. Some lecturers may have difficulty interacting with new technology or understanding the feedback provided by AI systems."</i>
	R8-IF	<i>"Artificial intelligence may not be able to fully understand the individual context and needs of lecturers. It is possible that the feedback generated by AI systems may not always be appropriate or sufficient for each lecturer."</i>
	R9-PUT	<i>"Some aspects or situations in a research context may be difficult for an AI system to understand automatically, potentially resulting in less appropriate or relevant feedback for lecturers."</i>

1) Challenges in Developing Scientific Writing Skills

One of the main challenges identified is the gap in scientific writing skills among lecturers. Some lecturers

may already have a solid foundation, while others need more guidance and support. Time limitations are also a challenge, especially for lecturers, in writing scientific papers. The large

number of students to handle and provide feedback can make it difficult to pay enough attention to the writing process.

2) Potential Challenges in Integrating Artificial Intelligence

A challenge that may arise when integrating artificial intelligence is limited access to relevant resources and scientific literature. Sometimes, AI-generated manuscripts are not equipped with strong references, reducing the reliability and accuracy of the manuscript. Additionally, there are concerns that the use of artificial intelligence may not fully address the gap in scientific writing skills among lecturers. Some lecturers may have difficulty interacting with new technology or understanding the feedback provided by AI systems. Artificial intelligence may also not fully understand the context and individual needs of lecturers. This may result in the feedback generated by the AI system not always being appropriate or adequate for each lecturer, which may reduce the effectiveness of using this technology in the development of scientific writing skills.

By understanding these challenges, developing appropriate strategies for the integration of artificial intelligence in the training and development of scientific writing skills becomes essential. A holistic approach and comprehensive support are needed to overcome these challenges and ensure that artificial intelligence truly provides significant benefits (Francesc Pedró, 2022; Hinojo-Lucena et al., 2019) for the development of scientific writing skills in educational settings.

Educational implications

This research has several important educational implications. First, educational institutions must

integrate artificial intelligence in lecturer training programs to improve their scientific writing skills. By providing comprehensive training on the concepts and applications of artificial intelligence in scientific writing, institutions can prepare lecturers with relevant skills to face future challenges. Second, a project-based learning approach can be an effective strategy in teaching scientific writing skills. Lecturers need to be given scientific writing projects that are relevant to their field so that they can apply the concepts learned in real contexts (Coffin et al., 2005). Third, educational institutions also need to pay attention to the challenges that may arise in integrating artificial intelligence in the development of scientific writing skills. By providing appropriate support, such as additional training or mentoring, lecturers can overcome technical barriers and increase the effectiveness of using this technology.

Thus, this research provides an in-depth look at the importance of the integration of artificial intelligence in the development of scientific writing skills in educational settings, as well as the challenges and opportunities associated with implementing this strategy. With a better understanding of this, educational institutions can be better prepared to deal with change and prepare lecturers for an increasingly digitally connected future.

Conclusion

This research identifies the need for the integration of artificial intelligence (AI) with scientific writing skills in the lecturer training program at Muhammadiyah University Enrekang. Observation results show that AI integration can increase efficiency in the writing process, personalize learning, use resources more effectively, improve

writing quality, and develop lecturers' digital skills. In the context of this research, scientific writing strategies implemented in training programs include the introduction of artificial intelligence in scientific writing, relevant AI applications and tools, strategies for integrating artificial intelligence in writing scientific papers, as well as practical examples and illustrations. Through a project-based learning approach and the use of AI applications such as ChatGPT, CopyAI, Perplexity, and others, lecturers are taught to produce comprehensive and quality scientific articles.

The interview results show that lecturers recognize the important role of artificial intelligence in supporting the writing of scientific papers. They believe that AI can provide fast and detailed feedback, help in identifying the right solutions, and improve the overall quality of writing. However, challenges were also identified, including gaps in scientific writing skills among lecturers, time constraints, and the potential inappropriateness of feedback generated by AI systems. Therefore, the development of holistic strategies and comprehensive support is needed to overcome these challenges.

References

Baker, T., Smith, L., & Anissa, N. (2019). Educ-AI-tion rebooted? Exploring the future of artificial intelligence in schools and colleges. *Retrieved May, 12(February), 2020.* https://media.nesta.org.uk/documents/Future_of_AI_and_education_v5_WEB.pdf

Bitsch, V. (2014). Ensuring the quality of the findings of qualitative research: looking at trustworthiness criteria. *Journal of Emerging Trends in Educational Research and Policy Studies, 5(2), 272–281.* <https://doi.org/10.3109/08941939.2>

Chatterjee, S., & Bhattacharjee, K. K. (2020). Adoption of artificial intelligence in higher education: a quantitative analysis using structural equation modelling. *Education and Information Technologies, 25(5), 3443–3463.* <https://doi.org/10.1007/s10639-020-10159-7>

Chen, T. J. (2023). ChatGPT and other artificial intelligence applications speed up scientific writing. *Journal of the Chinese Medical Association, 86(4), 351–353.* <https://doi.org/10.1097/JCMA.0000000000000900>

Chiu, T. K. F., & Chai, C. S. (2020). Sustainable curriculum planning for artificial intelligence education: A self-determination theory perspective. *Sustainability (Switzerland), 12(14).* <https://doi.org/10.3390/su1214556>

Coffin, C., Curry, M. J., Goodman, S., Hewings, A., Lillis, T. M., & Swann, J. (2005). *Teaching academic writing: A toolkit for higher education.* Routledge.

Cope, B., Kalantzis, M., & Searsmith, D. (2021). Artificial intelligence for education: Knowledge and its assessment in AI-enabled learning ecologies. *Educational Philosophy and Theory, 53(12), 1229–1245.* <https://doi.org/10.1080/00131857.2020.1728732>

Day, R. A., & Gastel, B. (2012). *How to Write and Publish a Scientific Paper* (Seventh Ed). Cambridge University Press. www.cambridge.org/9781107670747

Derish, P. A., Maa, J., Ascher, N. L., & Harris, H. W. (2007). Enhancing the Mission of Academic Surgery by Promoting Scientific Writing Skills. *Journal of Surgical Research, 140(2), 177–183.* <https://doi.org/10.1016/j.jss.2007.02.018>

Francesc Pedró. (2022). Applications of Artificial Intelligence to higher education: possibilities, evidence, and challenges. *IUL Research, 1(1), 61–76.* <https://doi.org/10.57568/iulres.v1i1.43>

Graham, S. E., & Harris, K. R. (2014). Conducting high quality writing intervention research: Twelve recommendations. *Journal of Writing Research*, 6(2), 89–123. <https://doi.org/10.17239/jowr-2014.06.02.1>

Hinojo-Lucena, F. J., Aznar-Díaz, I., Cáceres-Reche, M. P., & Romero-Rodríguez, J. M. (2019). Artificial intelligence in higher education: A bibliometric study on its impact in the scientific literature. *Education Sciences*, 9(1). <https://doi.org/10.3390/educsci9010051>

Hutson, J., Jeevanjee, T., Graaf, V., Vander, Lively, J., Weber, J., Weir, G., Arnone, K., Carnes, G., Vosevich, K., Plate, D., Leary, M., & Edele, S. (2022). Artificial Intelligence and the Disruption of Higher Education: Strategies for Integrations across Disciplines. *Creative Education*, 13(12), 3953–3980. <https://doi.org/10.4236/ce.2022.1312253>

Kuleto, V., Ilić, M., Dumangiu, M., Ranković, M., Martins, O. M. D., Păun, D., & Mihoreanu, L. (2021). Exploring opportunities and challenges of artificial intelligence and machine learning in higher education institutions. *Sustainability (Switzerland)*, 13(18), 1–16. <https://doi.org/10.3390/su131810424>

Majid, I., & Lakshmi, Y. V. (2022). Artificial Intelligence in Education. *The Indian Journal of Technical Education*, 45(3), 11–16.

Muhie, Y. A., Wolde, A. B., & Woldie, A. B. (2023). Integration of Artificial Intelligence Technologies in Teaching and Learning in Higher Education.

Science and Technology, 2020(1), 1–7. <https://doi.org/10.5923/j.scit.20201001.01>

Nelson, J. (1990). This Was an Easy Assignment: Examining How Students Interpret Academic Writing Tasks. *Research in the Teaching of English*, 24(4), 362–396.

Shiohira, K. (2021). Understanding the impact of artificial intelligence on skills development. In *United Nations Educational, Scientific and Cultural Organization*. UNESCO-UNEVOC International Centre for Technical and Vocational Education and Training. <http://en.unesco.org>.

Singh, V., & Mayer, P. (2014). Scientific writing: Strategies and tools for students and advisors. *Biochemistry and Molecular Biology Education*, 42(5), 405–413. <https://doi.org/10.1002/bmb.20815>

Turbek, S. P., Chock, T. M., Donahue, K., Havrilla, C. A., Oliverio, A. M., Polutchko, S. K., Shoemaker, L. G., & Vimercati, L. (2016). Scientific Writing Made Easy: A Step-by-Step Guide to Undergraduate Writing in the Biological Sciences. *He Bulletin of the Ecological Society of America*, 97(4), 417–426.

Yang, S., & Bai, H. (2020). The integration design of artificial intelligence and normal students' Education. *Journal of Physics: Conference Series*, 1453(1). <https://doi.org/10.1088/1742-6596/1453/1/012090>

Zia-ud-Din, M., Ed.daran, D., & Elhajraoui, F. E. (2023). Role of Artificial Intelligence in Legal Education in the 21st Century. *FWU Journal of Social Sciences*, 17(2), 62–77.

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