Jurnal Ilmiah Universitas Batanghari Jambi e-ISSN: 2549-4236, p-ISSN: 1411-8939
Lembaga Penellitian dan Pengabdian kepada Masyarakat
Vol 24, No 2 (2024): Juli, 1265-1270
DOI: 10.33087/jiubj.v24i2.5483

Leveraging AI to Optimize English Academic Writing (EAW) in Intelligent Decision Support Systems (IDSS)

Sri Marmoah, Dimas Adika, Sri Haryati, Yurni
University of Sebelas Maret, University of Batanghari
Correspondence: marmuah@staff.uns.ac.id, dimas.adika@staff.uns.ac.id,
nafisahatiku@staff.uns.ac.id, yurni@unbari.ac.id

Abstract. *Many students and academics face difficulties in English academic writing, particularly non-native speakers of English. This paper examines the use of Artificial Intelligence (AI) in optimizing English academic writing in intelligent decision supporting systems (IDSS). Various literatures were studied to find out how AI can help improve English academic writing. The findings reveal that AI can improve grammar, spelling, sentence construction and make suggestions for clarity and cohesion through tools like Grammarly. Furthermore, integrating AI into IDSS also promotes more efficient and data driven decisions. However, there are still barriers like complex data analysis, ensuring accuracy and reliability of AI-generated content, and addressing ethical issues including bias and transparency. This simple paper highlights the importance of developing more sophisticated and user-friendly AI technologies and the need for further research to explore the long-term impact of using AI in English academic writing for Indonesia context. The results are beneficial to learners, educators and learning institutions as they employ AI tools with the purpose to improve the English academic writing quality and support better decision making.*

Keywords: *Artificial Intelligence, English Academic Writing, IDSS*

INTRODUCTION

English academic writing is a fundamental component of scientific communication in this globalization era. The context of academic writing in this paper is English academic writing. Academic writing comprises various forms such as research papers, dissertations, essays, and journal articles. Academic writing aims to make scholarly ideas, theories and research results comprehensible in a clear, accurate and structured form (Nedjai, 2023). Additionally, academic writing helps in spreading knowledge, encourages critical thinking and supports academic discourse and innovation. Good academic writing is the calling card of the author, it demonstrates the expertise and perspective of the author while contributing to the clout of a researcher within the academic community.

AI systems for text generation have become very advanced and now have applications in almost every aspect of academic writing-whether to improve overall writing or the quality of research output (Zhicheng, 2024). This paper investigates the incorporation of AI-based tools and services in English academic writing outputs, focusing on integration with IDSS. Artificial intelligence (AI), is the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings such as the capability to learn and solve Complex Problems. When viewed in terms of English academic writing, AI becomes a tool that can help in so many different ways in so many different areas through iterations of the writing process. From advanced plagiarism to advanced grammar and style check, Artificial intelligence (AI) has the solution to help writers generate masterpiece yet unique copies fast.

These tools give writers immediate feedback using AI (artificial intelligence) driven technologies where they can correct and improve their work in real-time. Moreover, the use of AI tools can support in research and data analysis to provide research and recommendations that could simplify and improve the whole academic writing work. The integration of AI in academic writing has the potential to change the landscape of scientific communication, enabling researchers and students to produce more thoughtful, impactful, and innovative publications (Carobene et al. 2023). Intelligence Decision Support Systems (IDSSs) is a type of system used to support the decision-making process using AI technologies, and data analytics. Which provide constructive information and suggestions resulting in the result of costly data processing to make strategic decision-making decisions. In the academic

writing world, IDSS have the potential to bring AI to improve writing quality, compliance to academic standards, and offer a better way for researchers and professionals to collaborate.

Leveraging AI functionalities, coupled with decision support module, IDSS can disrupt the process of academic writing, by reducing the turnaround time, and enhancing its effectiveness. Integrating intelligent databases that can store and manage a variety of academic materials, including literature, data, and metadata, is one of the key components of IDSS in academic writing (Jain & Jain 2023). By combining this intelligent database with AI-driven search and retrieval methods, authors can retrieve relevant data and sources to support their research and writing. Furthermore, authors can continuously enhance their abilities with the help of IDSS, which offers customized recommendations and coaching based on writing preferences, style, and past writing performance (Vohra & Das, 2011); (Power, 2002); and (Kaklauskas, 2014).

Another missing point in IDSS in academic writing is the advanced language and natural language generation. These AI-powered tools can help writers compose error-free, and readable content, so they do not have to then spend their energy proofreading and editing everything written manually. IDSS can also assist field experts in various other ways by automating certain writing tasks so as to enable them to concentrate on some other imperative areas of project such as to assist students and academicians to focus on concept development, data analysis, and articulation of their research. This paper focuses on academic writing in English and how AI can be integrated in DSS to provide better support for decision-making. Academic writing in English and the integration of AI in IDSS are important because our country, Indonesia, is involved in the global scientific community that uses English, English is the access to a wide variety of research resources and information and AI technology can help overcome barriers for non-native English students and academicians in Indonesia to enhance the quality of English academic writing.

METHOD

The purpose of this paper is to conduct concise review discussing how AI contributes in improving English academic writing and consider intelligent decision support system (IDSS). The strategy is selected by the researchers as it makes sure all the data collected and analysed is from relevant and reliable sources and gives a profound understanding of the subject who is being studied. Collecting data is by searching and selecting scientific articles from reputable journals and academic repositories. Keywords such as “AI in English academic writing”, “decision support systems”, “AI in education”, and “optimizing English academic writing” were used to search for relevant literature. Key themes, patterns, and significant discoveries about the application of AI in academic writing were found through the use of content analysis techniques. The collected literature was arranged according to pertinent themes. They are AI roles in optimizing academic writing, benefits and challenges, and the future of AI on academic writing quality and decision-making in Indonesia. This simple investigation enabled the researchers to develop findings and provide recommendations for further research.

RESULT

The Role of AI in Academic Writing Optimization

Automated Grammar and Style Checking

One of the most direct benefits of AI in academic writing is the automation of grammar and style checking. AI-powered tools such as Grammarly and Hemingway Editor analyze texts for grammar mistakes, punctuation errors, and stylistic inconsistencies. These tools provide real-time feedback, allowing writers to correct errors and polish their writing in real-time. AI algorithms can “suggest alternative phrases and word choices, improving the clarity and readability of the text.” This immediate feedback helps authors refine their work continuously, thus improving the overall quality of the final product (Vacalares et al., 2023). Real-time AI support also reduces the need for extensive revisions, thus saving time and effort. In addition, AI can provide deeper insights by analyzing writing patterns, identifying areas for improvement, and suggesting personalized strategies for professional development. Moreover, AI can provide solutions to increasing modern challenges that are exponentially creating difficulties in access to education and teaching and learning activities (Ahmad, et al, 2021).

Detection and Prevention of Plagiarism

Plagiarism is one of the largest issues threatening academic writing. Applications

which use artificial intelligence for plagiarism detection cross the text to a great number of published documents of any kind to validate if it is not a plagiarism. These tools also identify the cases where work is not unique and offer global reports along with the identification to offer re-assurance to the authors. "Originality Report Generated by Turnitin". This supports academic integrity. Besides that, it can paraphrase and cite, which diminishes the chance of you plagiarizing unconsciously. At the same time, AI tools enhance the reliability of academic writing since they promote the use of reliable sources.

Research and Data Analysis Assistance

AI can greatly improve the research and data analysis phase of an academic paper. This involves sifting through a large number of academic documents, identifying the most related sources among the large collection, and selecting the critical parts with the help of AI tools like IBM Watson and Google Scholar. Consequently, the researcher is in a position of being able to produce any form of visual representation they desire as well as perform statistical analyses with the help of AI algorithms; which give the researcher insights that matter as well as serve to save some time. Meanwhile, for faster research on the data collected, the IBM Watson tool is effective in analysing large chunks of data for information. Therefore, in its current form, it allows authors to attend to constructing their work and contribution to the discipline more intently.

Improvements in the Flow of Writing

Most of the writing steps ranging from drafting, writing to even proofreading are made easier by AI tools. For instance, NLP algorithms can assist with the first step of drafting and using the input data while on the other hand, machine learning models indicating the result or changes as the writer proceeds. In a way of helping in organizing documents, to make sure it has constructed logic and the flow of thoughts well (Carobene et al., 2023). Furthermore, through voice-to-text authors are allowed to speak out their ideas without having to spend time typing saving time also, it enhances the inclusiveness of disabled during writing process. Thus, all the tools should be interconnected in a way that AI enhances all the processes of writing.

Challenges In Academic Writing and Decision Support

Complex Data Analysis Needs

Despite the positive sides of using artificial intelligence in academic writing and decision support systems, its integration presents certain issues. One of them is a need for complex data analysis. In most cases, academic research needs inclusion of large multi-faceted datasets that require advanced analytics. Though AI can aid in carrying out data processing, accuracy and relevancy of AI-generated insights depend on the initial quality of input data as well as the power of algorithms used (Ball, 2023).

Ensures Accuracy and Reliability of AI-Generated Content

It is also important to ascertain the authenticity of materials provided by an AI aided system in order to avoid plagiarism while writing academic papers. This means that such suggestions should not be taken as gospel truth if they are to be employed at all (Abu, 2024). For instance, a clear distinction between human and machine contributions is established in the academic research. Therefore, whether used by humans or machines, it is necessary for the suggestions to be clearly stated and unambiguous.

Addressing Ethical Concerns, Such as Bias and Transparency

It would thus be irresponsible for academic writers to blindly depend on AI without dealing with biases and transparency. Consequently, there can still exist biased algorithms following training data patterns especially in machine learning systems that need improvement regarding fairness (Abu, 2024). Furthermore, it requires objectivity within academia in order to carry out proper research. The designing and training of AI models which utilize different data sets will help reduce bias since various unbiased datasets will assist in minimizing biasness within artificial intelligence models (McCallum & Deborah, 2015). Additionally, accountability demands that there should be transparency throughout the whole process of decision-making using AI. It implies that users need to comprehend how choices were made by the system if they are going to judge their relevance.

Future Prospects for Ai Integration In Academic Writing In Indonesia

In our country, Indonesia, there is a very slow increase in embracing AI tools in academic

writing; however, the trend is rising steadily. With digital infrastructure and educational resources development underway countrywide, many institutions are recognizing that artificial intelligence can bring improvements to academic quality and productivity. Universities as well as research centres are incorporating Grammarly and Turnitin under their academic programs so that they may benefit students and lecturers during writing assignments or even research work. An Indonesian Ministry of Education and Culture report established that there was an increased reliance on AI tools by Indonesian students and researchers especially in urban areas where internet connectivity is better.

In this study, it is revealed that AI tools do more than merely efficient in shaping the writers' academic writing in Indonesia. This calls for the fact that while technology is being adopted in academics, particularly in AI frequencies, they also impact the student learning experience and research findings (Chen & Song 2023). Such AI tools include a writing aid which offers feedback and an advanced grammar check; features which not only supplement this writing, but also increase general academic output. With the help of such types of these kinds of sources including Indonesian authors scholars can now communicate scholarly and conduct research in ways. The country is advancing in terms of technology and therefore there are chances to offer AI a role in changing how academic writing is conducted in Indonesia (Hamamah et al, 2023). Therefore, it indicates that artificial intelligence systems can provide more accurate and relevant recommendations by applying improved natural language processing accompanying with machine learning algorithms that correspond to specific linguistic and academic requirements of the indigenous Indonesian researchers or students. Moreover, through constant refining and cooperation between local intellectuals, they would be able to create useful and preferably improved artificial intelligence tools that are more efficient as well as being ethically acceptable for integration into any form of scholarly work.

AI is a technology domain that is developing rapidly, in the education sector it can produce new teaching and learning solutions (Pedro, 2019). To overcome this challenge specific solutions are required which will provide equal chances to all students and researchers. The main difficulty in bridging the digital gap between urban and rural areas lies mainly on infrastructure provision. More importantly, expanding internet coverage and educational resources in remote regions would help in narrowing this gap by allowing more users to employ AI tools into their studies hence reducing inequalities of education while enhancing national competence among learner and scholars across Indonesia researchers (Batubara & Fithriani, 2023). AI authoring tools that can be customized or developed for Bahasa Indonesia are necessary in dealing with language barrier. These AI technology tools also offer contextualized feedbacks and suggestions as per Bahasa Indonesia linguistic rules, norms, and conventions. When developing AI systems that support AI-focused tools for academic writings which use Bahasa Indonesia as a medium of instruction, it is vital for the university community to ensure that they prioritize such developments so as to make them accessible to all (Carobene et al., 2023). AI can utilize learning and has the ability to adapt (Chen et al, 2020). Language barrier would be resolved by building as well as implanting AI authoring tools that are specifically designed for Bahasa Indonesia. These tools offer not only linguistic assistance but also come up with feedbacks and recommendations that align with Bahasa Indonesia language usage and academic norms. All students and researchers will have access to this kind of artificial intelligence support if there are AI tools made purposely for Bahasa Indonesia (Carobene et al., 2023). Looking into the future of AI integration in Indonesian academic writing, a collective effort involving government agencies, educational institutions, linguists and AI developers would be recommended. How campuses interact with AI developers on one side and linguistics on another end as well as how governments relate to both parties simultaneously. Therefore, sharing resources towards creating localized idiomaticity of Indonesian blended together with appropriate academia-oriented Artificial Intelligence systems. Additionally, interdisciplinary cooperation could make sure that while Autogenerated Abstract: Academic Writing by Indonesian Scholars under the Influence of Artificial Intelligence 73 AI improves writing practices in the academia, it assists in preserving traditional values within which these writings are embedded (Carobene et al., 2023).

In other words, according to Ahmad et al (2021), the education sector should use AI technologies every day to meet its needs. The rise of AI in academic writing in Indonesia has massive potential but it needs to be approached with great care and inclusivity by considering the specific challenges and ambitions of the country (Hamamah et al., 2023). As Indonesia marches ahead on the path of technological advancement, ethical inclusion and equity in academic writing will play a crucial role in creating a more comprehensive and impactful academia. As discussed above, despite the obstacles, AI tools for academic writing have vast benefits for Indonesia. Academic work could benefit from AI like enhancing its quality, relieving cognitive load on authors and increasing research productivity. By tackling its unique challenges and exploiting its potential advantages, Indonesia can enhance its academic output thereby contributing towards global knowledge generation more meaningfully (Hamamah et al., 2023). An intelligent decision support system (IDDS) is a combination of artificial intelligence (AI) and (DDS) which is an efficient tool for improving technical education. IDDS can provide assistance to decision makers in solving complex problems and as a tool for evaluating the quality of decisions thereby increasing the effectiveness and efficiency of education (Habanik et al, 2017).

CONCLUSION

There are many advantages to embracing AI in optimizing academic writing for Intelligent Decision Support Systems. For example, Grammarly is an AI tool that can automate grammar and style checks, identify plagiarism, conduct researches and perform data analysis as well as simplifying writing process. They increase the quality of written work, enhance productivity and support informed decision making in relation to academic writing. The utilization of AI tools can narrow down the educational gap in Indonesia with the aim of improving academic standards provided that challenges like digital divide and language barriers are addressed. Nevertheless, additional investigations are still necessary for a full realization of the possibilities presented by an AI in academic writing. There is a need to overcome obstacles such as complex data analysis requirements; ensuring accuracy and reliability of information produced by artificial intelligence systems; dealing with issues such as bias or transparency relating to ethics among others. Collaboration among scholars, programmers and teachers results into more ethical and efficient artificial intelligence system that should be developed through continuous innovation.

Therefore, focus on developing digital infrastructure alongside deploying AI tools specifically meant for supporting local languages. As AI technologies grow smarter, scholarly writing practices will become smarter, more accessible and meaningful. The academic community can take benefits of AI applications and integrate it into smart authoring platforms, decision support systems, and other knowledge-based applications. In the digital age, scholarly communication will become better and productive, driving innovations and sharing knowledge. In Indonesia, the effective implementation of AI applications in academic writing practices will bring significant impacts on education outcomes and contributions of scientific and technological advances in global aspects.

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