Examining the Acceptance of Artificial Intelligence in Writing Publications Among Senior High School Teachers in Singkawang

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ABSTRACT

This study explored the acceptance of Artificial Intelligence (AI) in writing publications among senior high school teachers in Singkawang, adopting the Technology Acceptance Model (TAM) as a framework. The research aimed to comprehend teachers' attitudes toward AI integration in their writing practices. AI, including tools such as Google Translate, Grammarly, QuillBot, ChatGPT, and Elicit, offers multifaceted benefits, enhancing writing productivity, providing real-time feedback, and assisting in language translation. The study involved 30 teachers, utilizing the final version of TAM to assess Perceived Usefulness, Perceived Ease of Use, Attitude toward Usage, and Behavioral Intention to Use. Results revealed a moderate level of acceptance, with 83.3% falling into the medium category. Descriptive statistics underscore positive perceptions, indicating that teachers recognize AI's potential benefits, yet qualitative insights are needed to explore barriers and variations in acceptance levels. Despite concerns of over-reliance and potential biases, AI tools significantly contribute to writing efficiency, accessibility, and democratization of information. The study recommends future research to investigate specific AI tool impacts and individual experiences for a more comprehensive understanding of AI acceptance dynamics among Singkawang teachers.

ARTICLE INFO

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INTRODUCTION

Artificial Intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think, learn, and perform tasks typically requiring human intelligence. These tasks include problem-solving, speech recognition, learning, and perception (Tripathi, 2021). AI systems use algorithms and large datasets to analyse information, identify patterns, and make decisions. Machine learning, a subset of AI, allows systems to improve their performance over time through experience. Natural Language Processing (NLP) enables machines to understand and respond to human language, facilitating communication between humans and machines (Tecuci, 2012).

AI holds a leading position in technological advancements for education as it can provide individualized learning experiences, adapting to learning needs, and facilitating modernization in teaching methods (Panigrahi & Joshi, 2020). Personalized educational experience may cater to the unique needs and preferences of individual students (Colchester et al., 2017; Harry, 2023). For teachers, AI may provide an ability to analyse vast amounts of data and generate insights can assist educators in making data-driven decisions, optimizing curriculum design, and identifying areas for improvement in the learning process (Chen et al., 2020). Furthermore, AI-driven tools have the potential to automate routine administrative tasks, allowing educators to redirect their focus towards more personalized and interactive teaching methods (Harry, 2023; Tiwari, 2023).

Moreover, AI also can assist teachers with administrative tasks and achieving career advancement, particularly in publication which is required by the Indonesian government for teachers' promotions, AI can support in writing an article (Yusriadi et al., 2023). Natural language processing algorithms can aid in literature reviews, helping educators stay abreast of the latest research in their field and ensuring the incorporation of relevant and up-to-date information into their publications (Yusriadi et al., 2023). AI-powered writing assistants can assist in the drafting process, providing guidance on structure, coherence, and citation styles (Zhang et al., 2023). This not only improves the quality of the research output but also facilitates the publication process. Additionally, AI analytics can help educators strategically target reputable journals or conferences for submission, aligning with the government's expectations for widely disseminated research (Chen, Xie, & Hwang, 2020). In this way, AI serves as a valuable tool for teachers, not only in managing administrative tasks but also in facilitating teachers to meet the criteria for career advancement set by the Indonesian government.

There are various AI tools that can enhance teachers' research and writing endeavours. ChatGPT for example, is a variant of the GPT (Generative Pre-trained Transformer) language model developed by OpenAI. The "chat" in ChatGPT refers to its capacity to engage in conversation (Goar et al., 2023). Unlike earlier versions that were primarily designed for single-turn tasks, ChatGPT is fine-tuned to handle multi-turn conversations, making it more adept at generating contextually relevant responses in a chat-like format. It can understand and generate human-like text based on the input it receives, making it suitable for a wide range of applications, including chatbots, virtual assistants, and other natural language processing tasks. ChatGPT can assist writers in creating outlines, paraphrasing, generating sentences, and translating content into other languages (Dergaa et al., 2023). Functioning as a versatile writing companion, ChatGPT provides real-time feedback and suggestions, allowing educators to refine their ideas and present them with clarity, a crucial aspect of successful publication (DuBose & Marshall, 2023).

Besides ChatGPT, "Elicit: The AI research assistant" is also beneficial for helping teachers in publication. This is a groundbreaking tool that significantly enhances the writing process by seamlessly integrating artificial intelligence into the research phase. This application excels in its ability to streamline information gathering, employing advanced algorithms to sift through vast datasets and extract relevant details (Lameras & Arnab, 2021). Elicit not only assists in identifying key themes, trends, and expert insights but also offers a dynamic approach to elicitation by adapting to the specific needs of the writer. Its natural language processing capabilities enable it to understand nuanced queries and provide targeted

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information, making the research process more efficient and insightful. By serving as a sophisticated AI research assistant, Elicit empowers writers to access a wealth of diverse, high-quality data, ultimately contributing to the creation of well-informed, engaging, and thoroughly researched articles.

QuillBot, as an AI writing assistant another example of AI, offers writers a range of valuable benefits that significantly enhance the writing process. One of its key advantages lies in its paraphrasing capabilities, allowing writers to effortlessly rephrase sentences and paragraphs while maintaining the original meaning. This feature aids in avoiding plagiarism and ensures content remains unique (Biermann et al., 2022). QuillBot also serves as a valuable tool for overcoming writer's block by providing alternative word choices and sentence structures, fostering creativity and expanding the writer's linguistic repertoire. Additionally, its real-time feedback helps improve the overall quality and coherence of written content by suggesting improvements in grammar, syntax, and style. As an accessible and user-friendly writing companion, QuillBot ultimately accelerates the writing workflow, enabling writers to produce polished, plagiarism-free, and engaging content more efficiently (Ippolito et al., 2022).

Grammarly is a highly beneficial tool for writers crafting articles, offering a suite of features that significantly elevate the quality of written content. One of its primary advantages is its robust grammar and spell-checking capabilities, which help writers identify and correct errors, ensuring the final piece is polished and professional. Grammarly also provides valuable suggestions for improving sentence structure, word choice, and overall writing style, enhancing the clarity and coherence of articles. Its plagiarism detection feature is instrumental in maintaining the integrity of the content by identifying and preventing unintentional instances of copied text. Furthermore, Grammarly offers valuable insights into writing habits and patterns, helping writers refine their skills over time. As a comprehensive writing assistant, Grammarly proves to be an indispensable tool for article writers, fostering precision, clarity, and overall excellence in their written work (Andrews et al., 2006).

Google Translate serves a multifaceted role in both education and writing, offering invaluable functions that contribute to seamless language integration. In an educational context, Google Translate aids language learners by providing quick and accessible translations, facilitating comprehension of texts in different languages (Herlina et al., 2019). It promotes inclusivity and allows students to access a wealth of global knowledge without language barriers. Additionally, in writing, Google Translate is a useful tool for cross-cultural collaboration and research, enabling writers to engage with content from diverse linguistic sources. While it's essential to approach it with caution due to potential nuances lost in translation, Google Translate serves as a catalyst for breaking down language barriers in education and fostering a more interconnected and linguistically diverse writing landscape (Groves & Mundt, 2015; Thuan, 2022).

While AI undeniably offers significant advantages in assisting writers with article creation, it is not without its drawbacks. One major concern is the potential loss of creativity and the distinct human touch that sets individual writing styles apart. AI tools may streamline the writing process, but they can inadvertently homogenize content, diminishing the uniqueness and authenticity that human authors bring to their work (İmre, 2023). Additionally, reliance on AI may lead to over-reliance on automated suggestions, causing writers to become complacent in refining their own skills (DuBose & Marshall, 2023). Moreover, the risk of biased outputs exists, as AI models are trained on vast datasets that may perpetuate societal biases present in the training data (Crawford et al., 2023). As a result, writers must exercise caution and critical thinking when utilizing AI, recognizing its limitations and ensuring that the human element of creativity and discernment remains central in the article-writing process.

Despite the drawbacks, AI applications have undeniably played a pivotal role in advancing and refining the craft of writing. One of the most significant contributions is the efficiency and speed with which AI aids writers in generating content (Pereira et al., 2023). Automated tools assist in tasks such as grammar correction, language translation, and paraphrasing, allowing writers to focus more on conceptualizing and fine-tuning their ideas rather than getting bogged down in technical details. AI applications also provide valuable insights into writing patterns and style, helping writers identify areas for improvement and growth

(Alharbi, 2023). Moreover, the accessibility of AI tools contributes to a democratization of information, enabling a broader range of individuals to engage in writing, regardless of their linguistic proficiency (Tseng & Warschauer, 2023). While it's crucial to acknowledge and address the limitations, the positive impact of AI on writing cannot be overlooked, making the writing process more efficient, accessible, and dynamic.

Teachers can utilize AI technology to write academic articles (Kim & Kim, 2022a) as one example for disseminating their research findings and best practices. These articles can then be used as a means to showcase their achievements, contributing to their promotion, and ultimately leading to an increase in their salary. Nevertheless, there is a scarcity of research on AI acceptance among teachers, particularly those in Singkawang. Understanding the acceptance of AI technology among teachers in Singkawang City, particularly given its proximity to the border of Malaysia, is important for following reasons. Embracing AI in education can empower teachers to enhance their writing skills effectively, enabling educators to leverage advanced tools for personalized writing. By fostering a positive attitude towards AI, teachers in remote regions like Singkawang can contribute to sharing their experiences and best teaching practices, which is crucial for promoting digital literacy and competitiveness, especially in a region with international connections. Singkawang's proximity to the border of Malaysia underscores the potential benefits of aligning educational practices with global technological trends. Acceptance of AI technology can help bridge educational gaps, ensuring that teachers are equipped with the writing skills necessary for promotion or a salary increase to fulfil their needs and minimize the salary gap between teachers from neighbouring countries, such as Malaysia.

To comprehend teachers' acceptance of AI technology in writing practices, the authors embraced the Technology Acceptance Model (TAM). TAM is a theoretical framework that explores the factors influencing the acceptance and adoption of new technologies introduced by Fred Davis in the late 1980s (Malatji et al., 2020). In the context of AI for teachers in writing articles, several key constructs within TAM are particularly relevant. Perceived Usefulness assesses the degree to which teachers believe that utilizing AI in article writing will enhance their productivity and effectiveness (Baki, Birgoren, & Aktepe, 2018). Perceived Ease of Use gauges the extent to which teachers perceive AI tools as user-friendly and easy to integrate into their existing workflows (King & He, 2006). Attitude toward Usage reflects the overall positive or negative feelings teachers have regarding the incorporation of AI in their writing processes (Mailizar et al., 2021). Finally, Behavioral Intention to Use measures the teacher's likelihood of actually adopting AI for writing articles (Kim & Kim, 2022b) based on their perceptions of usefulness, ease of use, and overall attitude. These constructs collectively provide a comprehensive framework for understanding the nuanced dynamics of AI acceptance among teachers, shedding light on the factors influencing their willingness to integrate AI into their article writing practices. Therefore, the writers decided to use the TAM framework to examine the Acceptance of Artificial Intelligence, such as ChatGPT, Quilbot, Elicit, Grammarly, or Googel translate, in Writing Publications Among Senior High School Teachers in Singkawang.

METHOD

This research activity is part of a workshop as a community service, abbreviated as PKM (Pengabdian Kepada Masyarakat), organized by the Master's Program in Educational Technology at Tanjungpura University. The PKM activity took place on November 16, 2023, at SMAN 1 Singkawang (Figure 1). This PKM activity collaborated with the Coordination Meeting of High School Principals, abbreviated as MKKS (Musyawarah Kerja Kepala Sekolah) in the city of Singkawang. There were 30 teachers participating in this research. This research employs a quantitative approach using a survey method (Sudaryono, 2017; Sugiyono, 2019). The survey on the AI acceptance was assessed by using the Final version of the Technology Acceptance Model (Alharbi & Drew, 2014; Davis & Venkatesh, 1996) that consists of four

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constructs: "Perceived Usefulness", "Perceived Ease of Use", "Attitude toward Usage" and "Behavioural Intention to Use". The examples of items in the final version of the TAM were as follows: "Using AI applications such as Google Translate, Grammarly, Quilbot, and/or ChatGPT enhances my writing productivity", "In my opinion, AI applications like Google Translate, Grammarly, Quilbot, and/or ChatGPT are interesting", and "I always want to use AI applications such as Google Translate, Grammarly, Quilbot, and/or ChatGPT when writing scientific articles".

Response options range from strongly agree with a value of 5 to strongly disagree with a value of 1. Data collection took place during a workshop through Google Form. In this research, data will be analyzed using descriptive analysis techniques. The researchers later transformed the data initially stored in Excel into SPSS version 25 for further analysis. The data were categorized into three groups: low, medium, and high, using the psychological scale classification by Azwar (2012) with the formula outlined in Table 1. The classification was based on mean scores of AI acceptance among teachers: low category (<2.789), medium category (2.789 to 4.549), and high category (>4.549). The researchers subsequently analysed the results descriptively using percentages.

TABLE 1. TAM classification

Low	X < M – 1SD
Medium	M – 1SD ≤ X < M + 1SD
High	M + 1SD ≤ X

FIGURE 1. Workshop of AI for Writing among Teachers in Singkawang

RESULT AND DISCUSSION

The research aimed to explore the acceptance of Artificial Intelligence (AI) in writing publications among senior high school teachers in Singkawang, utilizing the Technology Acceptance Model (TAM) framework. A total of 30 teachers participated in the study, and the survey assessed their perceptions using the final version of TAM, focusing on Perceived Usefulness, Perceived Ease of Use, Attitude toward Usage, and Behavioral Intention to Use. The results, as presented in Table 1, indicate that the majority of teachers fall into the medium acceptance category (83.3%), with only a small percentage in the low (6.7%) and high (10%) categories, respectively.

TABLE 2. AI Acceptance Summary

AI Acceptance Category	Frequency (a)	Percent (%)
Low	2	6.7
Medium	25	83.3
High	3	10
Total	30	100

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The findings suggest a notable level of acceptance among teachers in Singkawang towards AI applications for writing articles. The prevalence of medium acceptance implies that teachers recognize the potential benefits of AI in enhancing their writing productivity and find these applications interesting. However, a smaller percentage in the high category may indicate a need for further exploration into the specific factors contributing to heightened acceptance among this subset of teachers.

Meanwhile, the descriptive statistics of AI acceptance (Table 3) provide a comprehensive overview of the teachers' attitudes and perceptions regarding the acceptance of Artificial Intelligence (AI) applications for writing tasks. The mean scores revealed a moderate level of agreement across various constructs. Notably, participants acknowledged that AI significantly improves their writing productivity (PU1), with a mean score of 3.7742 and a standard deviation of 0.99028, placing it in the "Medium" category. Additionally, the belief that using AI applications enhances confidence in writing academic articles (PU2) is evident, with a mean of 3.6452 and a standard deviation of 1.08162, also falling within the "Medium" category. The perception that AI tools are excellent for improving the quality of writing in English (PU3) is supported by a mean of 3.7742 and a standard deviation of 0.95602, categorizing it as "Medium".

TABLE 3. Descriptive Statistics of AI Acceptance

No	Item	N	Mean	Std. Deviation	Category
1	Perceived of Use (PU): 1. AI improves my writing productivity	30	3.7742	.99028	Medium
2	PU2. Using AI applications such as Google Translate, Grammarly, Quillbot, and/or ChatGPT enhances confidence in writing academic articles.	30	3.6452	1.08162	Medium
3	PU3. AI applications like Google Translate, Grammarly, Quillbot. and/or ChatGPT are excellent tools for improving the quality of my writing in English.	30	3.7742	.95602	Medium
4	Perceived ease of Use (PEU)1. I can easily access AI applications such as Google Translate, Grammarly, Quillbot, and/or ChatGPT.	30	3.7419	1.15377	Medium
5	PEU2. I am skilled in using AI applications such as Google Translate, Grammarly, Quillbot, and/or ChatGPT to write academic articles.	30	3.2903	.93785	Medium
6	PEU3. I understand and am proficient in using various features of AI applications such as Google Translate, Grammarly, Quillbot. and/or ChatGPT to write articles.	30	3.2258	.95602	Medium
7	Attitude Toward Usage (ATU)1. In my opinion, AI applications such as Google Translate, Grammarly, Quillbot, and/or ChatGPT are interesting.	30	3.8710	1.11779	Medium
8	ATU2. I always want to use AI applications such as Google Translate, Grammarly, Quillbot, and/or ChatGPT when writing academic articles.	30	3.6452	.98483	Medium
9	Behavioural Intention (BI)1. I always want to use AI applications such as Google Translate, Grammarly, Quillbot, and/or ChatGPT when writing academic articles.	30	3.7419	.99892	Medium
10	BI2. I will recommend to my colleagues to use AI applications such as Google Translate, Grammarly, Quillbot, and/or ChatGPT for writing academic articles.	30	3.7742	1.05545	Medium

Regarding the ease of use, teachers find it moderately easy to access AI applications (PEU1), with a mean of 3.7419 and a standard deviation of 1.15377, contributing to the "Medium" category. Although

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teachers express slightly lower but consistent agreement regarding their skills in using AI applications for academic writing (PEU2) and understanding various features (PEU3), both fall within the "Medium" category. Attitudes toward AI usage, as measured by interestingness (ATU1) and the desire to always use AI applications (ATU2), are generally positive but show some variability, with mean scores of 3.8710 and 3.6452, respectively. Lastly, teachers express a moderate intention to always use AI applications (BI1) and a balanced intention to recommend these tools to colleagues (BI2), with mean scores of 3.7419 and 3.7742, and standard deviations of 0.99892 and 1.05545, respectively. Overall, the "Medium" category reflects a nuanced and generally positive acceptance of AI applications for writing tasks, highlighting both agreement and some variability in teachers' perceptions and attitudes.

The research aligns with the literature indicating that AI tools offer valuable assistance in various aspects of writing, including productivity enhancement (Yusriadi et al., 2023), interesting applications (Mailizar et al., 2021), and the desire to incorporate AI in scientific article writing (Zhang et al., 2023). The data categorization into low, medium, and high acceptance groups provides a nuanced understanding of the teachers' attitudes toward AI, allowing for targeted interventions or support mechanisms to further promote acceptance and integration.

Furthermore, the positive acceptance of artificial intelligence (AI) for writing instruction among teachers is in line with several noteworthy research findings. In a study conducted by Kim & Kim (2022b), it was found that the use of artificial intelligence (AI) elicited positive responses from teachers regarding essay writing. The study reported that AI played a constructive role by providing examples on how to formulate robust paragraphs and sentences. Teachers expressed that AI facilitated the development of logical and systematic writing skills, emphasizing its utility in guiding them towards more effective and structured writing practices. Nevertheless, according to Regan et al. (2019), despite recognizing the potential benefits of AI, teachers highlighted concerns related to the time-consuming nature of integrating technology in teacaching writng and limitations in accessing these technological resources.

Collectively, these studies contribute to a growing body of research affirming the positive inclinations of educators towards leveraging AI for writing instruction and assessment. While the findings demonstrate an overall positive trend, the study could benefit from qualitative insights to delve deeper into teachers' perceptions and potential barriers hindering higher acceptance levels. Future research could explore specific AI tools' impact, considering individual preferences and experiences, contributing to a more comprehensive understanding of AI acceptance dynamics among teachers in Singkawang

CONCLUSION

This research investigated the Acceptance of Artificial Intelligence in Writing Publications Among Senior High School Teachers in Singkawang, employing the Technology Acceptance Model (TAM) as a framework to comprehend teachers' attitudes towards AI in their writing practices. The findings indicated that teachers in Singkawang demonstrated a moderate level of acceptance of AI, implying positive inclinations toward its integration. However, it is important to note that this study did not conduct interviews with teachers to delve deeper into their perceptions and identify potential barriers that might be limiting higher levels of acceptance. Future studies could examine the specific impacts of various AI tools, taking into account individual preferences and experiences. Such research endeavors could contribute to a more comprehensive understanding of the AI acceptance among teachers in Singkawang.

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