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The Influence of AI-Assisted Writing Tool on Writing Skills and Learning Motivation of Information Systems Students

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ABSTRACT

This study investigates the influence of an AI-assisted writing tool on the writing skills and learning motivation of students in the Informatics Engineering and Information Systems programs. English courses in technology-related departments require students to develop writing competence for reports, documentation, and project-based tasks, making the integration of artificial intelligence tools highly relevant. This research employed an experimental design involving experimental and control groups, using pre-test, post-test, and motivation questionnaires as research instruments. The experimental group received writing instruction supported by an AI-assisted writing tool, while the control group was taught using conventional instructional methods. The results showed a significant improvement in students' writing skills, with the mean score increasing from 45.55 in the pre-test to 80.00 in the post-test. The prerequisite tests indicated that the data were normally and homogeneously distributed. Hypothesis testing revealed that the t-count value (12.0859) was higher than the t-table value (1.667), indicating a statistically significant difference between the two groups. In addition, the motivation questionnaire results demonstrated high levels of self-efficacy (80%), self-regulation (82%), and enjoyment in writing (83%) among students in the experimental group. These findings suggest that the use of an AI-assisted writing tool effectively enhances students' writing skills and learning motivation in English instruction for and Information Systems programs.

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INTRODUCTION

In recent years, the landscape of language education has undergone significant transformations driven by rapid developments in digital technology and Artificial Intelligence (AI). The integration of AI-assisted tools into English language instruction, particularly in writing, has attracted increasing scholarly attention due to their potential to address persistent instructional challenges. In non-English departments such as Informatics Engineering and Information Systems, writing is a crucial skill that supports students' ability to produce reports, technical documentation, project descriptions, and written communication in professional and technological contexts. Writing, therefore, is not merely a linguistic activity but a complex cognitive process involving idea generation, organization, language accuracy, and task-specific conventions (Hyland, 2019).

For students in technology-related programs, English writing skills are essential for academic tasks and future professional demands, including software documentation, system reports, research summaries, and project-based communication. However, many students encounter difficulties in expressing ideas clearly, organizing information logically, selecting appropriate vocabulary, and maintaining grammatical accuracy (Weigle, 2002; Paltridge, 2020). In the Indonesian EFL context, studies have shown that students in non-English majors often struggle with coherence, limited lexical resources, and low confidence when completing writing tasks in English (Suryani & Susanto, 2021). These challenges are frequently compounded by writing anxiety and low self-efficacy, which reduce students' willingness to engage actively in writing activities (Yan & Horwitz, 2008).

Traditional approaches to teaching writing in higher education, particularly in non-language departments, often emphasize grammatical correctness and final product assessment rather than the writing process itself. Instructional time constraints and large class sizes further limit the provision of timely and individualized feedback. As a result, students may receive feedback too late or in a form that does not sufficiently support revision and skill development (Ferris, 2003). Such conditions highlight the need for instructional innovation that can support students during the writing process and encourage autonomous learning.

In this context, AI-assisted writing tools present promising pedagogical opportunities. These tools utilize natural language processing (NLP) and machine learning technologies to provide immediate, context-sensitive feedback, enabling students to revise their writing iteratively and independently (Zhang et al., 2020). AI-assisted writing tools can offer suggestions related to sentence structure, vocabulary choice, coherence, and clarity, which are particularly beneficial for students who lack extensive exposure to English writing practices. Moreover, such tools support learners in developing metacognitive awareness by encouraging reflection on language use and writing strategies (Chukharev-Hudilainen & Bilyeu, 2021).

From a theoretical perspective, the use of AI-assisted writing tools aligns with sociocognitive views of writing, which conceptualize writing as a cognitive activity situated within social, instructional, and technological contexts (Flower & Hayes, 1981; Hyland, 2003). Interaction with AI-based systems allows learners to engage in an ongoing dialogue with both the text and the tool, fostering a dynamic process of knowledge construction and text improvement. This interaction is particularly

relevant for Informatics Engineering and Information Systems students, whose learning environments are closely connected to digital technologies.

Beyond cognitive outcomes, the integration of AI-assisted tools also has important motivational implications. Motivation is widely recognized as a key factor influencing students' engagement and success in writing, encompassing dimensions such as self-efficacy, self-regulation, and enjoyment (Pintrich & Schunk, 2002; Zimmerman, 2000). Empirical research has demonstrated that students who feel competent, autonomous, and engaged are more likely to invest effort in writing tasks and persist through challenges (Deci & Ryan, 1985; Dörnyei, 2001). In writing contexts, high levels of self-efficacy and self-regulation are associated with greater willingness to draft, revise, and improve written work (Bandura, 1997; Teng & Zhang, 2016). Enjoyment in writing also plays a significant role in reducing apprehension and enhancing fluency, yet it is often overlooked in instructional practices (Pekrun, 2006; Csikszentmihalyi, 1990).

Despite the growing interest in AI-assisted learning, empirical studies examining the use of AI-assisted writing tools in Indonesian EFL contexts, particularly among students in Informatics Engineering and Information Systems programs, remain limited. Existing research has largely focused on automated grammar checkers or writing evaluation tools such as Grammarly, Turnitin, and Write & Improve (Ranalli, 2018; Li, Link, & Hegelheimer, 2015). However, AI-assisted writing tools with inquiry-driven and interactive features, such as Perplexity, have received relatively little attention in formal academic research, especially in relation to both writing performance and motivational aspects.

Therefore, this study aims to examine the influence of an AI-assisted writing tool on the writing skills and learning motivation of Information Systems students at STTI NIIT. Employing a quantitative approach with a quasi-experimental design involving pre-test and post-test, this research investigates the effectiveness of AI-assisted writing instruction in improving students' writing performance. Additionally, a questionnaire is used to explore motivational dimensions, including self-efficacy, self-regulation, and enjoyment in writing. The findings of this study are expected to contribute to the growing body of literature on AI-assisted language learning, provide empirical evidence for the integration of AI tools in English instruction for technology-related disciplines, and offer pedagogical insights for enhancing writing instruction in higher education.

Research Method

This study employed a quasi-experimental design with a pre-test and post-test control group to examine the effect of an AI-assisted writing tool on students' writing skills and learning motivation. Two groups were involved: an experimental group that received writing instruction supported by the Perplexity application and a control group that received conventional writing instruction without AI assistance. Both groups were administered identical pre-tests and post-tests to measure improvements in writing performance. A learning motivation questionnaire was also distributed after the intervention to identify changes in students' motivation levels.

The participants were 40 undergraduate students from the Information Systems program at STTI NIIT during the 2024/2025 academic year. The participants were purposively selected based on their enrollment in the English for Information

Systems course and were then randomly assigned into two equal groups, consisting of 20 students in the experimental group and 20 students in the control group. All participants had a comparable English proficiency level (intermediate), as confirmed through institutional records. Prior to data collection, informed consent was obtained, and participants were assured that their participation was voluntary and that all data would be kept confidential.

Two instruments were used in this study: a writing test and a learning motivation questionnaire. The writing test was designed to assess students' writing skills in English, focusing on clarity, coherence, organization, and language accuracy in information systems–related writing tasks such as reports, system descriptions, and project documentation. The test was administered twice, as a pre-test and a post-test. The learning motivation questionnaire was adapted from Pintrich and De Groot (1990) and Teng and Zhang (2016) and measured three motivational dimensions: self-efficacy, self-regulation, and enjoyment in writing. All items employed a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Reliability analysis yielded a Cronbach's alpha coefficient of 0.87, indicating high internal consistency.

FINDINGS

This section presents the findings of the study based on the analysis of quantitative data obtained from the writing pre-test and post-test scores and the post-treatment motivation questionnaire. The results demonstrate the impact of using an AI-assisted writing tool on students' writing skills and learning motivation.

Improvement in Writing Performance

To determine the effect of an AI-assisted writing tool (Perplexity) on students' writing skills, the pre-test and post-test scores of the experimental and control groups were compared.

Table 1 Writing Performance

Group	N	Pre-Test Mean	Post-Test Mean	Mean Gain	SD (Post test)
Experimental group	20	45.55	80.00	+34.45	4.85
Control group	20	46.10	58.30	+12.20	5.12

The comparison of pre-test and post-test scores revealed improvement in both the experimental and control groups. However, the experimental group showed substantially greater gains. The experimental group's mean score increased from 45.55 in the pre-test to 80.00 in the post-test, resulting in a mean gain of 34.45 points. In contrast, the control group improved from 46.10 to 58.30, with a mean gain of 12.20 points. These results indicate that students who received writing instruction supported by Perplexity achieved significantly higher improvement than those who received conventional instruction.

The findings indicate that the use of an AI-assisted writing tool such as Perplexity supported students in generating ideas, organizing content, and revising their writing through guided feedback. This aligns with Flower and Hayes' (1981) writing process theory, which views writing as a recursive activity involving planning, drafting, and reviewing. Consistent with this result, Alhosani (2022) reported that AI-driven writing platforms significantly improved students' writing

performance through immediate feedback and scaffolding. Similarly, Li and Zou (2023) found that the use of AI-powered tools enhanced coherence, lexical variety, and syntactic complexity in students' writing. These findings suggest that AI-assisted writing tools effectively support the development of writing skills among Information Systems students.

Enhanced Student Motivation

Students' motivation was measured using a questionnaire assessing three dimensions: self-efficacy, self-regulation, and enjoyment in writing. The data were collected after the treatment and analyzed using descriptive statistics.

Table 2. Motivation Levels of Information Systems Students in the Experimental Group

Motivation Component	Mean Score (1–5)	Percentage score	Category
Self-Efficacy	4.00	80%	High
Self-Regulation	4.10	82%	Very High
Enjoyment in Writing	4.15	83%	Very High
Overall Average	4.08	81.6%	Very High

As shown in Table 2, students in the experimental group demonstrated high to very high levels of motivation after the implementation of the AI-assisted writing tool. Enjoyment in writing achieved the highest percentage score (83%), followed by self-regulation (82%) and self-efficacy (80%). These results indicate that the use of Perplexity positively influenced students' motivational engagement in writing activities.

This finding is consistent with Self-Determination Theory, which highlights autonomy and competence as essential factors in fostering intrinsic motivation (Deci & Ryan, 1985). By allowing students to manage their own writing process and providing immediate, task-relevant feedback, Perplexity supported learners' sense of autonomy and competence. Additionally, the results align with Dörnyei's (2001) L2 motivation framework, which emphasizes learner autonomy and strategic engagement as key contributors to sustained motivation. The increased levels of self-regulation and self-efficacy observed in this study suggest that students became more metacognitively aware and confident in their writing abilities, supporting effective and motivated learning (Zimmerman, 2000).

The findings indicate that AI-assisted writing tools can be effectively integrated into English instruction for Information Systems students to enhance writing skills and learning motivation. The use of such tools enables instructors to adopt a facilitative role by guiding students in using AI to support planning, drafting, and revision processes. However, ethical considerations must be addressed by emphasizing that AI serves as a supportive aid rather than a substitute for original thinking and critical analysis. Therefore, explicit guidance on academic integrity and responsible AI use is essential to maintain a balance between technological assistance and learner autonomy (Elmahdi, 2023).

CONCLUSION

This study has empirically demonstrated the positive impact of an AI-assisted writing tool on writing skills and learning motivation of Information Systems

students at STTI NIIT. The quantitative findings revealed a significant improvement in students' writing performance, as indicated by the substantially higher post-test scores achieved by the experimental group compared to the control group. In addition, the motivation questionnaire results showed that students who used the AI-assisted tool exhibited higher levels of self-efficacy, self-regulation, and enjoyment in writing activities.

These findings highlight the pedagogical value of integrating AI-assisted technology into English instruction for Information Systems students. The use of Perplexity not only supported the development of students' writing skills in technology-related contexts but also enhanced their affective engagement with the writing process, fostering greater learner autonomy, confidence, and motivation. The results are consistent with established theoretical perspectives on writing and learning, including the writing process model, Self-Determination Theory, and self-regulated learning theory.

In conclusion, the integration of an AI-assisted writing tool such as Perplexity can serve as an effective instructional strategy to improve writing skills and learning motivation in English courses for Information Systems programs. These findings suggest that AI-supported writing instruction has strong potential to enhance the quality of writing pedagogy in higher education, particularly in technology-oriented disciplines.

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