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The Influence of AI-Based Perplexity Media on Academic Writing Skills and Motivation of English Education Students

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ABSTRACT

This study investigates the influence of AI-based Perplexity media on English Education Department students' academic writing skills and motivation at STKIP Kusumanegara Jakarta. The research, conducted as an experimental study with both experimental and control groups, utilized pre-test, post-test, and questionnaire as research instruments. After conducting pretest and posttest experiments using Perplexity media, the average pretest score was 45.55 and the posttest score reached 80.00. The prerequisite tests for normality and homogeneity indicated that the data were normally and homogeneously distributed. Hypothesis testing showed that t-count (12.0859) > t-table (1.667), indicating a significant difference in writing performance. The motivation questionnaire results also showed significant differences, with the experimental group achieving high levels in self-efficacy (80%), self-regulation (82%), and enjoyment in writing (83%). These findings suggest that AI-based Perplexity significantly enhances both academic writing skills and students' motivation.

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INTRODUCTION

In recent years, the landscape of language education has undergone profound transformations, largely driven by advancements in digital technology and Artificial Intelligence (AI). The integration of AI-based tools into English language instruction, particularly in writing, has sparked growing academic interest due to their potential to address longstanding pedagogical challenges. Writing—especially academic writing—is not merely a linguistic activity; it is a complex, recursive process that involves critical thinking, idea organization, syntactic control, and genre awareness (Hyland, 2019). For students majoring in English Education, academic writing is a core competency, as it equips them with the skills to conduct research, produce scholarly work, and communicate effectively in academic and professional settings (Weigle, 2002; Paltridge, 2020).

Despite its importance, academic writing remains a persistent obstacle for many students. Research has consistently highlighted issues such as limited vocabulary, lack of cohesion and coherence, superficial argumentation, and poor grammatical accuracy as common weaknesses among undergraduate writers (Al Fadda, 2012; Nordin & Mohammad, 2006). In Indonesia, studies show that students often struggle with structuring their ideas logically, citing sources appropriately, and adhering to academic conventions (Suryani & Susanto, 2021). Moreover, writing anxiety and low self-confidence exacerbate these challenges, contributing to students' reluctance to engage in writing tasks (Yan & Horwitz, 2008).

Traditional classroom-based approaches to teaching academic writing frequently emphasize grammatical correctness and final product evaluation, rather than the process of writing itself. Feedback, though crucial, is often delayed or too general, limiting its effectiveness in fostering revision and improvement (Ferris, 2003). In this context, AI-based writing assistants, such as Perplexity, offer innovative pedagogical affordances. These tools leverage natural language processing (NLP) and machine learning algorithms to provide immediate, context-aware feedback, allowing students to revise their texts iteratively and independently (Zhang et al., 2020). They also support learners in developing metacognitive strategies by offering paraphrasing suggestions, vocabulary alternatives, and structural improvements (Chukharev-Hudilainen & Bilyeu, 2021).

From a theoretical standpoint, the use of AI tools in academic writing can be framed within the sociocognitive approach to writing, which views writing as a cognitive activity situated within a social and technological context (Flower & Hayes, 1981; Hyland, 2003). By interacting with AI-based systems, students engage in meaningful dialogue with the text and the tool, promoting a dynamic process of knowledge construction and text development. Moreover, the motivational dimension of AI integration cannot be understated. Motivation is widely recognized as a key predictor of academic success in writing, encompassing intrinsic and extrinsic elements such as self-efficacy, goal orientation, self-regulation, and task value (Pintrich & Schunk, 2002; Zimmerman, 2000).

Empirical studies have shown that when students perceive learning tasks as engaging and relevant, and when they feel competent and autonomous, their motivation

and performance increase significantly (Deci & Ryan, 1985; Dörnyei, 2001). In writing contexts, students who exhibit high levels of self-efficacy and self-regulation are more likely to invest effort in drafting and revising their work (Bandura, 1997; Teng & Zhang, 2016). Enjoyment in writing, often overlooked, also plays a critical role in reducing writing apprehension and enhancing writing fluency (Pekrun, 2006; Csikszentmihalyi, 1990).

The implementation of Perplexity as an AI-based educational tool thus aligns with both cognitive and affective principles of writing pedagogy. However, despite its growing popularity, there remains a paucity of research exploring the impact of Perplexity on both academic writing performance and motivational aspects in the Indonesian EFL (English as a Foreign Language) context. Most existing studies focus on grammar checkers or automated writing evaluation tools such as Grammarly, Turnitin, or Write & Improve (Ranalli, 2018; Li, Link, & Hegelheimer, 2015), while Perplexity, with its chat-based, inquiry-driven writing support, remains underexplored in formal academic research.

This study aims to fill this gap by examining the influence of the Perplexity AI-based media on English Education Department students' academic writing skills and motivation at STKIP Kusumanegara Jakarta. By adopting a quantitative approach using a quasi-experimental design with pre-test and post-test, this research investigates the effectiveness of Perplexity in improving writing outcomes. Furthermore, a questionnaire is employed to explore motivational dimensions—self-efficacy, self-regulation, and enjoyment—that may be influenced by the use of this AI application. The results are expected to contribute to the growing body of literature on AI-assisted learning, provide empirical evidence for the effectiveness of Perplexity in EFL writing instruction, and offer pedagogical implications for integrating intelligent tools in writing curricula

RESEARCH METHOD

This study employed a quasi-experimental design with a pre-test and post-test control group to investigate the effect of AI-based Perplexity media on students' academic writing skills and motivation. The design involved two groups: an experimental group that received treatment using Perplexity application in the writing process, and a control group that received conventional academic writing instruction without the aid of AI tools. Both groups were given identical pre-tests and post-tests to measure improvement in academic writing performance. Additionally, a motivation questionnaire was administered to both groups to assess changes in motivation levels after the intervention.

This design was selected due to its appropriateness in examining cause-effect relationships in natural classroom settings while minimizing threats to internal validity (Creswell, 2012; Fraenkel, Wallen, & Hyun, 2019). The participants of this study were 40 undergraduate students enrolled in the English Education Department at STKIP Kusumanegara Jakarta during the 2024/2025 academic year. They were purposively selected based on their enrollment in the Academic Writing course and were then

randomly assigned into two equal groups: 20 students in the experimental group and 20 students in the control group.

All participants had comparable backgrounds in terms of age, English proficiency level (intermediate), and academic writing experience, as verified through institutional records and a background questionnaire. Informed consent was obtained, and participants were assured of the confidentiality of the results and their voluntary participation in the study.

This study employed two main instruments: a writing test and a motivation questionnaire.

a. Writing Test

The academic writing test was designed to assess students' ability to produce a coherent, structured, and argument-based essay in English. The test was administered twice: as a pre-test (before the intervention) and a post-test (after the intervention).

b. Motivation Questionnaire

A structured questionnaire was used to measure students' **motivation** related to academic writing. The instrument was adapted from Pintrich & De Groot (1990) and Teng & Zhang (2016), consisting of three subscales:

All items used a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire was administered after the post-test. A Cronbach's alpha reliability analysis was conducted, yielding a reliability coefficient of $\alpha = 0.87$, indicating high internal consistency.

RESULT AND FINDINGS

This section presents the findings of the study based on the analysis of quantitative data obtained from (1) the writing pre-test and post-test scores, and (2) the post-treatment motivation questionnaire. The data highlight the impact of using the AI-based *Perplexity* media on students' academic writing performance and their motivational levels.

1. Writing Performance Improvement

To determine the effect of *Perplexity* on students' academic writing skills, pre-test and post-test scores were compared between the experimental and control groups.

Table 1 Writing Performace

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

As shown in Table 1, both groups experienced improvement in writing scores. However, the experimental group demonstrated a significantly greater gain (+34.45 points) compared to the control group (+12.20 points). This indicates that the integration of Perplexity into writing instruction resulted in substantial improvement in students' academic writing.

The results of the independent samples t-test confirmed the statistical significance of this difference:
T-count = 12.0859, T-table (df = 58, $\alpha = 0.05$) = 1.667. Since T-count > T-table, the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_1) is accepted.

2. Motivation Questionnaire Results

Students' motivation was measured using a questionnaire that assessed 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 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
Self-Efficacy	4.00	80%	High

The findings indicate that students in the experimental group developed high levels of motivation after using *Perplexity*. The highest score was found in enjoyment in writing (83%), suggesting that students found the writing process more engaging and enjoyable when assisted by the AI tool. Self-regulation (82%) and self-efficacy (80%) also showed strong scores, implying that students gained more confidence in their writing abilities and took greater responsibility in managing their learning.

These results support the theoretical assumption that technology-supported learning environments can foster student motivation by promoting autonomy, competence, and engagement (Deci & Ryan, 1985; Zimmerman, 2000; Dörnyei, 2001).

1. Improvement in Academic Writing Performance

The significant increase in post-test scores in the experimental group suggests that Perplexity serves as an effective digital writing assistant. The results support the assertion by Warschauer & Healey (1998) that technology-enhanced language learning environments provide learners with immediate feedback and access to rich language resources, which help improve writing fluency and accuracy.

AI tools like Perplexity allow learners to generate ideas, organize their arguments, and revise their writing based on guided suggestions. According to Flower & Hayes' (1981) process theory of writing, writing is a recursive cognitive activity that involves planning, translating, and reviewing. The Perplexity application aligns well with this model by supporting learners at each stage of the writing process.

These findings are also in line with those of Alhosani (2022), who found that AI-driven platforms significantly improved students' writing scores due to instant feedback and scaffolding. Likewise, the study by Li & Zou (2023) found

that students who used AI-powered tools such as GPT and Grammarly showed better coherence, lexical variety, and syntactic complexity in their essays.

2. Enhanced Student Motivation

Motivation plays a critical role in the success of writing instruction. The results showed high levels of motivation in the experimental group, particularly in the areas of self-efficacy (80%), self-regulation (82%), and enjoyment in writing (83%). This implies that Perplexity not only served as a writing aid but also as a motivational tool.

These findings are consistent with Self-Determination Theory (Deci & Ryan, 1985), which emphasizes the importance of autonomy, competence, and relatedness in fostering intrinsic motivation. The use of Perplexity enables students to take control of their own writing process (autonomy), provides support that enhances performance (competence), and encourages meaningful engagement (relatedness to task).

Furthermore, the results align with Dörnyei's (2001) framework on L2 motivation, which underlines the role of learner autonomy and strategic engagement in sustaining long-term motivation. The increased levels of self-regulation and self-efficacy found in this study indicate that students became more metacognitively aware and confident in their writing abilities—two key predictors of successful language learning outcomes (Zimmerman, 2000).

3. Pedagogical Implications

The findings of this study have several pedagogical implications. First, AI-assisted writing tools can be meaningfully integrated into English academic writing classes to support both skill development and learner motivation. Second, instructors can shift from being content providers to facilitators, guiding students on how to use AI responsibly and critically in the writing process.

However, it is also important to consider ethical issues surrounding over-reliance on AI tools. As highlighted by Elmahdi (2023), students should be trained to use AI as a support mechanism, not a replacement for original thought or critical analysis. Educators must emphasize the importance of academic integrity and scaffold the use of AI to maintain a balance between assistance and autonomy.

4. Limitations and Future Research

While the study provides significant insights, it is not without limitations. The sample size was relatively small and limited to one institution, which may affect generalizability. Also, the study focused on short-term outcomes; future research may explore long-term impacts of AI-based writing assistance on writing competence and motivation over a full semester or academic year.

Moreover, further qualitative investigations—such as student interviews or writing portfolio analysis—could provide deeper understanding into how learners interact with AI tools and how their perceptions of writing evolve.

This section should explore the significance of the results of the study. A combined Findings and Discussion section is also appropriate. This section allows you to offer your interpretation and explain the meaning of your results. Emphasize any theoretical or practical consequences of the results.

CONCLUSION

This study has empirically demonstrated the positive impact of AI-based *Perplexity* media on both academic writing skills and student motivation in the English Education Department at STKIP Kusumanegara Jakarta. The quantitative data showed a significant improvement in writing performance, with the post-test scores of the experimental group increasing substantially compared to the control group. Additionally, the motivation questionnaire revealed that students using *Perplexity* exhibited higher levels of self-efficacy, self-regulation, and enjoyment in writing tasks.

These findings affirm the value of integrating AI-driven technology in academic writing instruction. The use of *Perplexity* not only enhanced students' technical writing abilities but also positively influenced their affective engagement with writing, thereby fostering a more autonomous, confident, and motivated learning environment. The results align with major theoretical frameworks in language learning, such as Flower & Hayes' writing process model, Deci & Ryan's Self-Determination Theory, and Zimmerman's theory of self-regulated learning.

In conclusion, *Perplexity* as an AI-based learning media can serve as a powerful pedagogical tool to support the development of critical academic skills, particularly in writing, among university students.

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