

# ESL Academic Writing In Higher Education

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## Abstract:-

*This impact of Artificial Intelligence (AI) tools on English as a Second Language (ESL) students' academic writing performance in higher education. It explores whether AI tools influence writing competence, autonomy, and perceptions of learning. Using a mixed-methods design with quantitative pre-post writing scores and qualitative student interviews, this study finds that AI tools significantly improve writing accuracy and confidence, but present challenges related to dependency and critical thinking. Findings support the integration of pedagogically structured AI use while highlighting the need for instructor scaffolding to maximize learning outcomes. AI is transforming ESL academic writing by enhancing research and learning processes while raising ethical concerns about plagiarism and authorship. This chapter presents a pilot study on AI-assisted writing, revealing improvements in organization, content quality, and language proficiency among sophomore students. While AI tools were generally perceived as supportive rather than substitutive, the study underscores the necessity of structured AI integration to maintain academic integrity while leveraging its potential for skill development.*

**Keywords:** ESL, academic writing, artificial intelligence, higher education, writing performance.

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## I. Introduction

Academic writing poses persistent challenges for ESL students due to linguistic complexity, cultural discourse conventions, and disciplinary expectations (Hyland, 2019). With the emergence of AI tools—such as language models and writing assistants (e.g., ChatGPT, Grammarly)—educators must critically assess how these technologies affect ESL learners' writing development. This study investigates the impact of AI on ESL academic writing in higher education, focusing on writing quality, learner perceptions, and implications for pedagogy.

## II. Literature Review

**ESL Academic Writing Challenges:-** ESL writing difficulties typically involve grammar accuracy, lexical choice, coherence, and rhetorical organization (Cumming, 2013). Students often struggle to transfer spoken English proficiency to formal written genres demanded by university contexts.

**AI in Education:-** AI in education includes automated feedback systems, intelligent tutoring, and natural language processing (NLP) tools that assess and generate text. Research indicates benefits in personalized support (Xie et al., 2021), although concerns about academic integrity and over-reliance persist.

**AI and Writing Performance:-** Studies show AI feedback can improve surface-level accuracy and revision quality in L2 writing (Li & Li, 2022). However, effects on deeper writing skills (argumentation, critical thinking) remain underexplored.

## III. Theoretical Framework

This research is grounded in Sociocultural Theory (Vygotsky, 1978) and Learner Autonomy Theory (Benson, 2011). Sociocultural Theory emphasizes mediated learning, suggesting AI tools act as mediational means between learner and writing task. Learner Autonomy Theory frames technology as a supporter of self-regulated learning, while also cautioning against dependency.

## IV. Hypotheses-

**H1:** ESL students using AI writing tools will demonstrate statistically significant improvement in academic writing scores compared to those who do not use AI tools.

**H2:** AI tool usage will positively correlate with students' self-reported confidence in academic writing.

**H3:** Excessive reliance on AI tools will be negatively related to critical thinking during revision.

## V. Methodology:-

**Research Design -:** A mixed methods approach combining quantitative writing assessment and qualitative interviews was used.

**Participants-:** Sample Size: 120 undergraduate ESL students enrolled in a writing course at a public university.

**Groups:** Control group (no AI use, n=60); Experimental group (AI use, n=60).

### Instruments-:

**Writing Tasks -:** Participants completed two academic writing tasks: a pre-test at the beginning and a post-test after 12 weeks of instruction.

**AI Tool-:** The experimental group used AI writing assistants (e.g., Grammarly and ChatGPT) during drafting and revision.

**Writing Rubric-:** Writing was scored based on grammar accuracy, coherence/cohesion, vocabulary use, and argument quality, on a scale of 0–100.

**Interviews-:** Semi-structured interviews (20 participants, 10 from each group) explored students' perceptions of AI tools.

**Data Collection Procedures-:** Pre- and post-test scores were compared statistically. Interviews were recorded and thematically analysed.

**Data Analysis-:** Quantitative: Paired t-tests and correlation analysis using SPSS.

Qualitative: Inductive thematic analysis following Braun & Clarke (2006).

## VI. Results

### Quantitative Findings

Component	Control Mean	Experimental Mean	p-value
Grammar Accuracy	66.2	78.9	0.002*
Coherence	54.5	69.4	0.001*
Vocabulary Use	61.1	72.3	0.004*
Argument Quality	58.3	61.5	0.087

\*Significant at  $p < 0.05$

The experimental group showed significant improvements in grammar, coherence, and vocabulary compared to the control group.

Argument quality increased but was not statistically significant.

**Correlation with Confidence -:** AI usage showed a moderate positive correlation with self-reported confidence scores ( $r = 0.48$ ,  $p < 0.01$ ).

### Qualitative Themes-:

**Theme 1: Scaffolded Support-:** Students valued immediate feedback and error explanation.

**Theme 2: Dependency and Uncertainty -:** Some students expressed reliance on AI, reporting reduced ownership of revisions.

**Theme 3: Critical Thinking Tension-:** Participants described tension between efficiency and evaluating AI suggestions critically.

## VII. Discussion:-

### Interpretation of Hypotheses-:

**H1 supported:** AI tools enhance measurable writing components.

**H2 supported:** Enhanced confidence aligns with previous research (Li & Li, 2022).

**H3 partially supported:** Qualitative data indicated possible over-reliance, though quantitative critical thinking measures were inconclusive.

**Implications-:** AI tools can function as pedagogical scaffolds that support form-focused writing development. Educators should integrate AI deliberately—balancing tool use with critical engagement tasks.

## VIII. Conclusion:

AI tools can significantly improve certain aspects of ESL academic writing but also pose risks to autonomous critical thinking if unmoderated. Structured classroom integration that combines AI with metacognitive strategy instruction is recommended.

## IX. Limitations-

1. Single-institution sample limits generalizability.

- 2.Short intervention period may underestimate long-term effects.
- 3.AI tool types varied across participants.

#### **X. Future Research Directions:-**

- 1.Longitudinal studies tracking writing development over semesters.
- 2.Experimental control of specific AI features.
- 3.Cross-cultural comparisons of ESL learners from diverse linguistic backgrounds.

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