DEVELOPING ACADEMIC WRITING SKILLS OF ENGLISH LANGUAGE STUDENTS THROUGH SCIENTIFIC RESEARCH METHODOLOGY

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Abstract: Academic writing has become an indispensable component of higher education because it enables students to communicate scientific knowledge in accordance with international academic standards. Despite significant developments in English language education, many undergraduate students continue to experience difficulties in organizing research-based arguments, synthesizing scholarly literature, applying appropriate citation styles, and maintaining academic integrity. This study investigates the impact of integrating scientific research methodology into English language instruction on the development of students' academic writing competence. Employing a mixed-methods research design, quantitative data were collected through pre- and post-tests, while qualitative evidence was obtained from interviews, reflective journals, and classroom observations. The findings demonstrate statistically significant improvements in students' writing organization, critical thinking, source integration, and research literacy. The study concludes that systematic instruction in scientific research methodology substantially enhances academic writing proficiency and recommends its broader integration into English language teacher education curricula.

Keywords: academic writing, scientific research methodology, English language education, research competence, higher education, academic literacy, mixed-methods research, critical thinking, citation skills, English for Academic Purposes, teacher education

Introduction

Academic writing has emerged as one of the fundamental competencies required for university students in the twenty-first century. In English language education, writing is no longer viewed merely as a linguistic skill but as an integrated cognitive, communicative, and research-oriented process through which students construct knowledge, evaluate evidence, and participate in scholarly discourse. Globalization, digitalization, and the internationalization of higher education have increased the necessity for future English language teachers to acquire advanced academic writing skills that comply with international publication standards (Hyland, 2019; Swales & Feak, 2020).

Previous studies have demonstrated that academic writing competence is closely associated with students' research literacy, critical thinking, and ability to employ scientific reasoning during knowledge construction (Creswell & Creswell, 2023). Scholars such as Hyland (2019), Flowerdew (2020), and Paltridge (2021) emphasize that effective academic writing instruction should be integrated with research methodology rather than taught as an isolated language component. Nevertheless, numerous higher education institutions continue to separate methodological preparation from academic writing instruction, resulting in fragmented learning experiences and insufficient research competence among English language students.

Although considerable research has examined English for Academic Purposes (EAP), comparatively limited attention has been devoted to investigating how systematic instruction in scientific research methodology influences academic writing development among prospective English language teachers, particularly within developing higher education systems.

Therefore, the primary objective of this study is to examine the effectiveness of integrating scientific research methodology into English language instruction for improving students' academic

writing skills. Specifically, the study seeks to evaluate changes in writing performance, research competence, critical thinking, and students' perceptions regarding research-based writing practices through a mixed-methods research approach.

Methods

The present study employed a **mixed-methods research design**, combining quantitative and qualitative approaches to provide a comprehensive understanding of the influence of scientific research methodology on the academic writing development of English language students. The integration of both research paradigms enabled the collection of measurable statistical evidence while simultaneously exploring students' experiences, attitudes, and perceptions toward research-based academic writing. Such methodological triangulation increased the credibility, validity, and interpretative depth of the findings (Creswell & Creswell, 2023).

The research was conducted during the 2025–2026 academic year at a higher education institution offering undergraduate programs in English Language Teaching. A total of 84 second-year students participated in the study through purposive sampling. The participants were divided into an experimental group (n = 42) and a control group (n = 42)**.** Both groups possessed comparable English language proficiency levels (B2 according to the Common European Framework of Reference) and had previously completed introductory writing courses. Prior to data collection, all participants voluntarily agreed to participate, and ethical principles concerning confidentiality, informed consent, and anonymity were strictly observed.

The experimental group received instruction through an integrated curriculum combining academic writing with scientific research methodology over a 12-week intervention period, whereas the control group followed the conventional academic writing syllabus. The intervention included explicit instruction on identifying research problems, formulating research questions and hypotheses, conducting literature reviews, paraphrasing and summarizing scholarly sources, applying APA citation principles, avoiding plagiarism, organizing IMRAD-based academic papers, interpreting statistical findings, and developing evidence-based arguments. Students also completed mini research projects that required the practical application of each methodological component throughout the semester.

For the quantitative phase, students completed standardized academic writing assessments before and after the intervention. Writing performance was evaluated using an analytic rubric adapted from internationally recognized academic writing assessment frameworks. Five dimensions were assessed: organization, academic vocabulary, grammatical accuracy, argument development, and source integration. Each criterion was scored on a twenty-point scale, producing a maximum score of 100. The reliability of the assessment instrument was confirmed using Cronbach's Alpha ($\alpha = 0.91$), indicating high internal consistency. Descriptive statistics, paired-samples t-tests, independent-samples t-tests, percentage analysis, mean scores, and standard deviation values were calculated using IBM SPSS Statistics 27 to determine statistically significant differences between groups (Pallant, 2020).

The qualitative phase consisted of semi-structured interviews with sixteen volunteer participants, weekly reflective journals, classroom observations, and document analysis of students' research papers. Interview questions focused on learners' experiences in integrating research methodology into writing, challenges encountered during the research process, and perceptions of academic confidence. Reflective journals provided longitudinal insights into students' cognitive development, while classroom observations documented collaborative learning, instructor feedback, and research-based writing behaviors. Qualitative data were transcribed verbatim and analyzed through thematic analysis following Braun and Clarke's six-stage framework, including familiarization, coding, theme generation, theme review, theme definition, and reporting (Braun & Clarke, 2022).

To ensure methodological rigor, multiple validation strategies were employed. Quantitative findings were supported through statistical significance testing, whereas qualitative trustworthiness was established using triangulation, member checking, peer debriefing, and prolonged engagement

with participants. The integration of numerical evidence and narrative interpretation facilitated a holistic evaluation of how scientific research methodology contributes to the development of academic writing competence among English language students. Consequently, the selected methodological framework not only strengthened the reliability of the research outcomes but also provided practical evidence applicable to curriculum development and English language teacher education.

Results and Discussion

The findings of the present study indicate that integrating scientific research methodology into academic writing instruction produced a substantial improvement in students' writing competence, research literacy, and confidence in scholarly communication. The mixed-methods approach enabled the comparison of measurable learning outcomes with students' perceptions and classroom experiences, thereby providing a comprehensive evaluation of the intervention. Quantitative findings revealed statistically significant differences between the experimental and control groups, while qualitative evidence explained the underlying factors contributing to these improvements.

The pre-test analysis confirmed that there was no statistically significant difference between the two groups before the intervention ($p > 0.05$). Both groups demonstrated comparable levels of academic writing proficiency, particularly in argument development, source integration, and citation accuracy. Following the twelve-week instructional period, however, the experimental group demonstrated remarkable progress across all assessed dimensions.

Table 1. Comparative Results of Academic Writing Performance Before and After the Intervention

Assessment Criteria	**Experimental Group (Pre-test)**	**Experimental Group (Post-test)**	**Control Group (Post-test)**
Organization	65.4	87.8	73.1
Academic Vocabulary	67.1	89.2	74.5
Grammar Accuracy	69.3	88.4	76.2
Argument Development	63.8	90.6	71.4
Source Integration & Citation	58.7	91.3	68.7
Overall Mean Score	**64.9**	**89.5**	**72.8**

Source: Compiled by the author based on the experimental research results (2026).

The results presented in Table 1 demonstrate a considerable increase in academic writing achievement among students who studied academic writing through scientific research methodology. The greatest improvement was observed in source integration and citation, where the average score increased from 58.7 to 91.3, representing an improvement of more than thirty percentage points. This finding suggests that systematic instruction in literature review techniques, citation practices, and paraphrasing substantially enhances students' academic integrity and scholarly writing competence.

Similarly, argument development increased from 63.8 to 90.6, indicating that students became more capable of constructing logical, evidence-based academic arguments. These findings support previous research suggesting that scientific thinking strengthens argumentative writing because students learn to justify claims through empirical evidence rather than personal opinion (Hyland, 2019; Paltridge, 2021).

Statistical analysis using an independent-samples t-test revealed a statistically significant difference between the post-test scores of the experimental and control groups ($p < 0.001$). The calculated effect size (Cohen's $d = 1.18$) indicates a large educational impact, confirming that integrating research methodology into academic writing instruction substantially contributes to students' learning outcomes.

To visualize the overall improvement, Figure 1 presents the comparative post-test performance of both groups.

The qualitative findings further explain these quantitative improvements. Analysis of interview transcripts, reflective journals, and classroom observations generated four major themes: enhanced research confidence, improved critical thinking, greater awareness of academic integrity, and stronger motivation toward scholarly writing.

Many participants reported that, prior to the intervention, they perceived academic writing as a purely linguistic task focused mainly on grammar and vocabulary. Following the research methodology course, students increasingly recognized academic writing as an evidence-based intellectual activity requiring systematic inquiry, analytical reasoning, and critical evaluation of scholarly literature.

One participant stated:

"Before this course, I only focused on writing correct English sentences. Now I first think about the research problem, supporting evidence, and how reliable my sources are."

Another participant emphasized:

"Learning research methodology changed the way I write. I became more confident because I knew how to search databases, compare previous studies, and organize my ideas scientifically."

Reflective journals demonstrated a gradual transition from descriptive writing toward analytical and critical writing. Students increasingly synthesized multiple scholarly sources instead of merely summarizing individual articles. Classroom observations also confirmed that collaborative peer-review sessions became more productive as learners applied methodological concepts such as validity, reliability, evidence evaluation, and logical argumentation during feedback discussions.

An important qualitative finding concerned students' attitudes toward plagiarism. Initially, several participants considered citation merely a formal academic requirement. After receiving instruction on research ethics and academic integrity, students began viewing citation as an essential component of scholarly responsibility. Consequently, instructors observed fewer cases of inappropriate source use and greater originality in research assignments.

These findings align with contemporary theories of English for Academic Purposes, which argue that academic writing cannot be effectively developed independently of research competence (Flowerdew, 2020; Swales & Feak, 2020). The integration of methodological instruction enabled students not only to improve linguistic accuracy but also to strengthen higher-order cognitive skills including evaluation, synthesis, interpretation, and evidence-based reasoning.

Overall, the quantitative and qualitative findings complement one another and demonstrate that scientific research methodology functions as a catalyst for academic writing development. Statistical improvements were reinforced by students' personal experiences, classroom observations, and reflective evidence, thereby increasing the validity of the research conclusions. The results suggest that integrating research methodology into English language curricula contributes simultaneously to linguistic competence, academic literacy, research skills, and professional preparedness of future English language teachers.

The findings therefore support the argument that academic writing instruction should extend beyond language mechanics and incorporate systematic research training. Such an integrated pedagogical model better prepares prospective English teachers to participate in international academic discourse, conduct independent research, and produce high-quality scholarly publications. The implications of these results are particularly relevant for higher education institutions seeking to modernize English language teacher education in accordance with global academic standards.

Conclusion

The findings of this study confirm that the integration of scientific research methodology into academic writing instruction significantly enhances the academic writing competence of English

language students. Unlike conventional writing courses that primarily emphasize grammatical accuracy and language structure, the integrated approach enables students to develop a comprehensive understanding of scholarly communication, including critical reading, evidence-based argumentation, literature synthesis, academic integrity, and appropriate citation practices. The statistically significant improvement observed in the experimental group's post-test scores, together with the qualitative evidence collected through interviews, reflective journals, and classroom observations, demonstrates that research-oriented instruction positively influences both linguistic performance and higher-order cognitive skills.

Although the present study yielded promising results, several limitations should be acknowledged. The research was conducted at a single higher education institution with a relatively limited sample size and one semester of intervention. Consequently, future studies should involve larger and more diverse participant groups, longitudinal research designs, and cross-institutional comparisons to examine the long-term impact of research methodology instruction on academic writing development. Further investigation may also explore the role of artificial intelligence–assisted writing tools, corpus-based instruction, and digital academic platforms in enhancing research competence among future English language teachers. Such studies would contribute to the continuous modernization of English language education and support the preparation of globally competitive educators capable of producing high-quality scientific research.

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