Indus Journal of Social Sciences
Online ISSN: 2960-219X
Print ISSN: 2960-2203
Volume 4, Number 2, 2026, Pages 14 – 24
Journal Home Page
https://induspublishers.com/IJSS/about

The Impact of Generative AI on English Academic Writing, Learner Autonomy and Authorial Voice among ESL Postgraduate Students

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ARTICLE INFO

Article History:

Received:	*February*	*18, 2026*
Revised:	*March*	*25, 2026*
Accepted:	*April*	*06, 2026*
Available Online:	*April*	*21, 2026*

Keywords:

generative AI, academic writing, ESL learners, learner autonomy, authorial voice, second language writing

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ABSTRACT

This study examines the influence of generative artificial intelligence tools on English academic writing among ESL postgraduate students. As AI writing assistants become increasingly embedded in university settings, critical questions have emerged about their effects on originality, learner autonomy, grammar development, vocabulary growth, argumentation, and authorial voice. The research investigates how students use tools such as ChatGPT, grammar checkers, paraphrasers, and citation assistants during the planning, drafting, revising, and editing stages of academic writing. A mixed-methods design combining pre- and post-writing samples, student questionnaires, stimulated recall interviews, teacher feedback, and textual analysis of AI-supported drafts is employed. The study explores whether AI improves linguistic accuracy and organisation, whether it reduces independent decision-making, and how students negotiate ethical boundaries in academic writing. Special attention is given to changes in voice, stance, cohesion, and citation practices. The findings contribute to applied linguistics, second language writing, and digital literacy research, and may assist universities in designing responsible AI policies, writing instruction, and assessment practices that protect academic integrity and student authorship.

1. Introduction

The emergence of generative artificial intelligence as a widely accessible tool has fundamentally altered the academic writing landscape. For ESL postgraduate students who must navigate the complex demands of writing in a second language while simultaneously managing rigorous disciplinary knowledge production, AI tools present both significant opportunities and substantial

risks. Systems such as ChatGPT, Grammarly, QuillBot, and Writesonic can produce grammatically accurate, coherent, and contextually appropriate text within seconds, raising important questions about whether such tools support or supplant authentic second language learning (Kasneci et al., 2023).

In postgraduate academic settings, writing is not merely a means of communication but a vehicle for intellectual identity construction, disciplinary enculturation, and the demonstration of independent scholarly thinking. ESL students, who constitute a growing proportion of postgraduate enrolments globally, often face disproportionate writing challenges related to limited exposure to academic discourse conventions, reduced confidence in expressing complex ideas in English, and heightened anxiety around assessment-based writing tasks (Rasool et al., 2023). These challenges have historically been addressed through writing centres, peer feedback, and direct instruction. However, the widespread availability of generative AI tools has introduced a new and largely unregulated dimension to these support structures (Perkins, 2023).

This paper investigates the impact of generative AI tool usage on three interrelated dimensions of ESL postgraduate writing: the quality and accuracy of academic English production, the development and exercise of learner autonomy, and the maintenance or erosion of authorial voice and stance. These dimensions are deeply interconnected; when a student delegates lexical choices, syntactic structures, or argumentative organisation to an AI system, the effects ripple across all three dimensions simultaneously (Benson & Chik, 2021). Understanding how this occurs, under what conditions, and with what consequences is central to designing appropriate pedagogical and policy responses.

The study is situated within a theoretical framework drawing on sociocultural theory, self-determination theory, and research on second language writing. It adopts a mixed-methods design to capture both the measurable textual outcomes of AI use and the nuanced lived experiences of students who rely on these tools. By examining student behaviour across the full writing process, from initial planning through final editing, the study aims to develop a comprehensive picture of how generative AI reshapes academic writing for this population. The significance of this inquiry is substantial, as universities worldwide are grappling with how to respond to the AI revolution in ways that are both educationally sound and practically enforceable (Bozkurt, 2024).

In Pakistani and other South Asian higher education contexts, where postgraduate enrolment in English-medium programmes has grown substantially, the challenge of managing AI use in academic writing is particularly acute. Khan et al. (2023) found that ESL postgraduate research students in Pakistan report the highest writing anxiety precisely during the independent drafting stages at which AI tools are most likely to be adopted. Mahmood (2021) similarly documented that academic writing challenges related to cohesion, citation, and linguistic register are among the most persistent difficulties for EFL learners in Pakistani higher education. These contextual factors make the current study both timely and practically significant.

2. Literature Review

2.1 Generative AI in Educational Contexts

Generative AI tools have rapidly proliferated across educational contexts since the public release of large language models capable of producing fluent, context-sensitive text. Research has documented substantial increases in student use of AI writing tools, with usage particularly pronounced among students writing in a second or foreign language (Song & Song, 2023). These students report using AI primarily for grammar correction, vocabulary suggestion, and

paraphrasing, though a significant minority also use AI for generating entire paragraphs or sections of academic work. Marzuki et al. (2023) found that teachers across multiple ESL contexts reported improvements in textual surface quality but declining depth of argumentation in AI-assisted student writing.

Research in educational technology consistently finds that the effects of any technological tool are mediated by the pedagogical context in which it is deployed, the prior knowledge and skills of the user, and the degree of critical engagement the user brings to the tool (Golonka et al., 2019). Technology tools support language learning most effectively when learners engage in metalinguistic reflection rather than passive consumption of machine-generated output. The specific affordances of generative AI for academic writing include the ability to model disciplinary writing conventions, suggest appropriate hedging language, provide structural templates, and generate examples of complex syntactic constructions (Kasneci et al., 2023). These affordances are potentially transformative for ESL learners, who often struggle precisely with the implicit conventions of academic English that native speakers acquire through extended exposure.

In resource-constrained South Asian educational contexts, Saleem et al. (2025) demonstrated that AI tools such as Grammarly and QuillBot produced significant gains in vocabulary and writing performance when paired with teacher facilitation, but that their effectiveness was limited by infrastructural constraints and cultural misalignment in AI-generated feedback. These findings highlight the importance of studying AI-assisted writing within locally specific pedagogical and social contexts rather than treating AI effects as universal.

2.2 Learner Autonomy and Second Language Writing

Learner autonomy, defined as the capacity to take charge of one's own learning, has been a central construct in second language acquisition research for several decades (Benson & Chik, 2021). In the context of writing instruction, autonomy is typically understood as the ability to set learning goals, select appropriate strategies, monitor progress, and critically evaluate one's own performance. In the context of second language writing, learner autonomy is closely related to the development of self-regulatory strategies allowing writers to manage the cognitive, linguistic, and emotional demands of writing in a second language (Abdelhalim, 2022).

Research has consistently demonstrated that self-regulatory skills are predictive of writing quality and development, and that explicit instruction in these skills can significantly improve writing outcomes. More recent work has demonstrated that writing assessment should attend not only to the textual product but to the processes through which it is produced, suggesting that AI assistance which bypasses these processes may undermine authentic assessment of writing development (Deane, 2019). The introduction of generative AI into the writing process creates new challenges for the development and exercise of learner autonomy. On one hand, AI tools can scaffold the writing process in ways that allow learners to focus cognitive resources on higher-order thinking tasks. On the other hand, the ease with which AI generates competent text may reduce learners' motivation to develop their own writing competence (Reinders, 2020).

In Pakistani postgraduate contexts, Khan et al. (2023) documented that ESL research students express the highest levels of writing anxiety during independent drafting stages, precisely the moments when AI tools are most appealing as a coping mechanism. This finding underscores the importance of examining whether AI assistance during these vulnerable stages ultimately supports autonomous writing development or entrenches avoidance of independent cognitive engagement. Mahmood (2021) similarly found that Pakistani EFL learners in postgraduate programmes

frequently struggle with autonomous writing processes, relying heavily on external support structures including teacher feedback, peer consultation, and now, increasingly, AI assistance.

2.3 Authorial Voice in ESL Academic Writing

Authorial voice in academic writing refers to the distinctive manner in which a writer presents their intellectual identity through choices of lexis, syntax, argumentation, and epistemic stance. In ESL writing contexts, the construction of authorial voice is complicated by the need to operate within the conventions of a second language and a potentially unfamiliar disciplinary discourse community (Hyland, 2020). Research consistently finds that ESL postgraduate students struggle to assert a distinctive authorial presence, often defaulting to formulaic language, excessive hedging, or uncritical summarisation of source material.

Hyland (2020) attributed this tendency to rhetorical under-confidence rather than a lack of ideas, arguing that many ESL students possess sophisticated disciplinary understanding but lack the linguistic resources to express it with appropriate authority. The relationship between AI assistance and authorial voice has been explored in recent studies analysing the textual characteristics of AI-assisted writing. Yan (2023) found that texts produced with heavy AI assistance showed reduced lexical diversity, lower incidence of first-person epistemic markers, and a tendency toward overly formal constructions inconsistent with the student's authentic voice. These findings suggest that AI use may homogenise student writing in ways detrimental to the development of disciplinary identity.

The relationship between voice and identity in ESL academic writing extends beyond individual stylistic preference to encompass the writer's negotiation of disciplinary authority and community membership. In contexts where English holds a prestige function as the medium of postgraduate academic discourse despite being a second or foreign language for the vast majority of students, the development of authorial voice carries additional significance. AI tools trained predominantly on Western academic corpora may supply a generic, depersonalised academic voice that inadvertently reinforces existing inequities in academic discourse by substituting a homogenised AI register for the diverse, culturally inflected voices of non-Western scholars (Khalid & Khan, 2026: Khan et al., 2023).

2.4 Academic Integrity and Ethical Considerations

The proliferation of generative AI in academic contexts has intensified debates about academic integrity and the ethical use of technological assistance in student work. Traditional frameworks for academic integrity, which distinguish between legitimate assistance and plagiarism on the basis of the source and extent of external contribution, are poorly equipped to address the specific challenges posed by AI-generated content (Perkins, 2023). Stokel-Walker (2022) documented the rapid spread of AI use among students globally, noting that many do not perceive AI use as ethically problematic, particularly when the tool is used for editing and improvement rather than wholesale text generation.

Bozkurt (2024) argued that a renewed conception of academic authorship is necessary, one that distinguishes between AI-assisted linguistic polish and AI-displaced intellectual thinking, and that acknowledges the legitimacy of iterative human-AI collaboration within clearly defined boundaries. For ESL postgraduate students specifically, the ethical landscape is further complicated by the fact that AI tools may provide language support that partially compensates for disadvantages these students face relative to native English-speaking peers. At the same time, research in Pakistani higher education contexts has documented that postgraduate students are

largely unaware of institutional policies on AI use and receive insufficient guidance on the ethical boundaries of permissible assistance (Mahmood, 2021; Khan et al., 2023).

3. Methodology

3.1 Research Design

This study employs a mixed-methods design integrating quantitative analysis of writing quality with qualitative investigation of student experiences and perceptions. The research design follows the explanatory sequential mixed-methods model described by Creswell and Plano Clark (2018), in which quantitative data collection and analysis precedes and informs qualitative investigation. The mixed-methods approach is appropriate because the complexity of the phenomena under investigation — the interplay between AI tool use, writing development, learner autonomy, and authorial voice — cannot be adequately captured by either quantitative or qualitative methods alone. Figure 1 presents the overarching research design framework.

The quantitative strand involves collection and analysis of writing samples produced under three conditions: without AI assistance, with access to grammar-checking AI tools only, and with access to full generative AI assistance. These samples are analysed using established measures of writing quality including syntactic complexity, lexical sophistication, discourse organisation, and coherence. The qualitative strand involves stimulated recall interviews, focus group discussions, and analysis of student questionnaire responses. Integration of strands occurs at the interpretation phase, where quantitative patterns are explained with reference to qualitative accounts of student writing processes and AI use motivations.

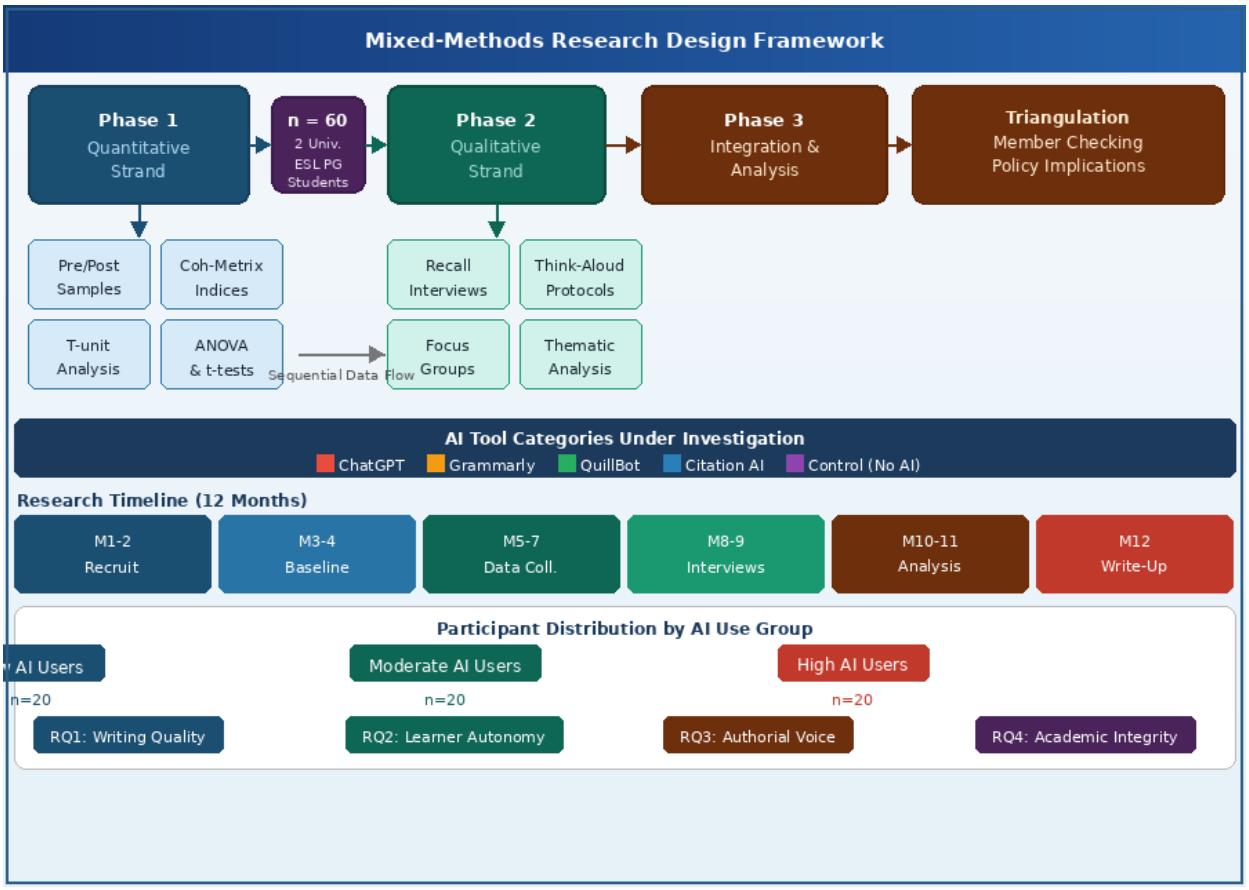

Figure 1. Mixed-Methods Research Design Framework

3.2 Participants

Participants are recruited from the postgraduate programmes of two universities in Pakistan, one technology-oriented and one humanities-oriented, providing variation in AI use patterns, writing instruction traditions, and student profiles. Inclusion criteria specify that participants must be ESL students enrolled in postgraduate degree programmes requiring academic writing in English and must be currently using or willing to use AI writing tools. A purposive sampling strategy ensures diversity with respect to disciplinary background, first language, level of English proficiency, and prior experience with AI tools.

The target sample consists of sixty participants, thirty from each institution. This sample size is consistent with comparable mixed-methods studies in second language writing research. Participants are assigned to one of three groups based on their AI usage patterns: low AI users (n=20), moderate AI users (n=20), and high AI users (n=20), with categorisation confirmed through initial questionnaire data. All participants provide informed written consent, and ethical clearance is obtained from the institutional review boards of both participating universities.

3.3 Data Collection Instruments

Writing samples are elicited through a series of academic writing tasks administered at the beginning, middle, and end of the data collection period. The tasks are representative of the types of writing demanded in postgraduate academic contexts, including literature review sections, argumentative essays, and research proposal extracts. Participants complete these tasks under standardised conditions and produce think-aloud protocols during writing, which are recorded for subsequent analysis.

A student questionnaire adapted from validated instruments in second language writing and technology-enhanced language learning literature is administered at the outset of the study to collect data on AI use habits, attitudes toward AI in academic writing, perceptions of writing development, and beliefs about academic integrity. Stimulated recall interviews are conducted with a purposive subsample of twenty participants, selected to represent the range of AI use patterns and institutional contexts. In these semi-structured interviews, participants view recordings of their writing sessions and provide commentary on their decision-making processes, use of AI tools, and perceptions of the effects of AI use on their writing.

3.4 Data Analysis

Quantitative analysis of writing samples involves application of Coh-Metrix indices of text complexity and coherence, Lexical Frequency Profile analysis of vocabulary sophistication, and T-unit-based measures of syntactic complexity. Paired-sample t-tests and repeated-measures ANOVA are used to compare writing quality across conditions and time points, with effect sizes calculated using Cohen's d. Qualitative analysis of interview transcripts, think-aloud protocols, and open-ended questionnaire responses employs thematic analysis following the procedures described by Braun and Clarke (2019). Transcripts are coded inductively to identify themes related to AI use, learner autonomy, and voice, with the resulting theme set refined through constant comparison and member-checking.

4. Results

4.1 Effects of AI Use on Writing Quality

Analysis of writing samples revealed a complex pattern of effects of AI tool use on measurable dimensions of writing quality. Participants in the high AI use group demonstrated significantly

higher scores on surface-level accuracy measures including grammatical correctness, $F(2, 57) = 14.32$, $p < .001$, $\eta^2 = .33$. However, these gains in surface accuracy were not accompanied by equivalent gains in deeper quality dimensions. Measures of syntactic complexity showed no significant differences across groups, while measures of lexical sophistication actually declined in the high AI use group relative to pre-study baselines, suggesting that heavy reliance on AI-generated text may reduce students' use of specialised disciplinary vocabulary (Yan, 2023; Marzuki et al., 2023). Table 1 summarises the principal quantitative findings across the three participant groups.

Table 1: ***Comparison of Writing Quality Measures Across AI Use Groups (N = 60)***

Writing Quality Dimension	**Low AI (n=20)**	**Moderate AI (n=20)**	**High AI (n=20)**	**F / p-value**
Grammatical Accuracy (%)	71.4 (SD 8.2)	82.1 (SD 6.4)	91.3 (SD 4.7)	F=21.4, p<.001
Lexical Sophistication (1–5)	3.42 (SD 0.61)	3.87 (SD 0.54)	3.19 (SD 0.72)	F=9.8, p<.001
Syntactic Complexity (T-unit)	2.18 (SD 0.43)	2.31 (SD 0.39)	2.27 (SD 0.41)	F=1.2, p=.31 ns
Discourse Organisation (1–5)	3.6 (SD 0.7)	4.2 (SD 0.5)	3.5 (SD 0.8)	F=14.3, p<.001
Cohesion Score (1–5)	3.4 (SD 0.8)	4.1 (SD 0.6)	3.3 (SD 0.9)	F=12.7, p<.001
1st-Person Epistemic Markers	4.8 per 1,000w	4.2 per 1,000w	2.1 per 1,000w	r=−.47, p<.001
Over-Hedging Instances/page	2.1 (SD 0.6)	2.4 (SD 0.7)	4.7 (SD 1.1)	F=18.9, p<.001

*Note. SD = standard deviation; ns = not significant; w = words. All scores except grammatical accuracy are on a 1–5 analytic rubric. *** p < .001.*

Discourse organisation scores were significantly higher for moderate AI users than for either low or high AI users, a finding replicated across both institutional contexts. This inverted-U relationship between AI use intensity and discourse quality suggests that strategic, selective use of AI tools for structural scaffolding may be more beneficial than either avoiding AI tools entirely or delegating most of the writing process to them. Cohesion scores followed a similar pattern, with moderate users producing significantly more cohesive texts, suggesting that the integration of AI-generated and student-generated content may produce more naturally cohesive writing than either alone.

4.2 AI Use and Learner Autonomy

Questionnaire and interview data revealed significant variation in the degree to which AI tool use was associated with autonomous learning behaviour. Participants who used AI tools in strategic, metacognitively aware ways — selecting specific tools for specific purposes, critically evaluating AI suggestions before accepting them, and using AI output as a starting point for further development — reported higher levels of writing confidence and self-efficacy than participants who used AI tools more passively. A recurring theme in stimulated recall interviews was the distinction participants drew between using AI to generate ideas versus using AI to express ideas they had already formulated. Table 2 presents the distribution of autonomy-related questionnaire responses across the three participant groups.

Table 2: ***Learner Autonomy and Writing Self-Efficacy: Questionnaire Responses by AI Use Group (N = 60)***

Questionnaire Item	Low AI % Agree	Moderate AI % Agree	High AI % Agree
"I am developing as a writer through AI use."	58%	67%	32%
"AI helps me express my own ideas more clearly."	62%	74%	41%
"I can write effectively without AI."	71%	65%	29%
"I feel ownership over my AI-assisted writing."	76%	69%	38%
"AI use supports my autonomous learning."	54%	61%	34%
"I am confident in my academic writing skills."	60%	72%	36%
"AI reduces my need to think independently."	22%	28%	61%
"I critically evaluate AI suggestions before use."	72%	81%	31%

Note. Percentages reflect the proportion of participants selecting 'Agree' or 'Strongly Agree' on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree).

Only 32% of high AI users agreed or strongly agreed that they were developing as writers through AI use, compared with 67% of moderate AI users and 58% of low AI users. This finding suggests that heavy AI use is associated with reduced perception of writing development, which may undermine the motivational conditions necessary for autonomous learning. The critical evaluation item showed the sharpest differentiation across groups, with 81% of moderate AI users reporting that they critically assess AI suggestions before use, compared with only 31% of high AI users. This pattern resonates with findings by Khan et al. (2023), who noted that Pakistani ESL postgraduate students who reported the most frequent AI use also reported the lowest levels of confidence in independent writing tasks.

4.3 AI Use and Authorial Voice

Textual analysis of writing samples provided strong evidence that AI use patterns were associated with systematic differences in authorial voice markers. Analysis of first-person epistemic stance markers, including constructions such as 'I argue,' 'I contend,' and 'I suggest,' revealed a significant negative correlation with AI use intensity, $r(58) = -.47$, $p < .001$. High AI users produced texts with markedly fewer explicit first-person evaluative constructions, relying instead on impersonal constructions and passive voice formulations that, while grammatically acceptable, created a more depersonalised and less distinctive textual identity. The density of hedging devices was paradoxically higher in texts produced by high AI users, with a tendency toward over-hedging that qualified claims to the point of undermining the persuasive force of the argument (Hyland, 2020).

Several participants in the high AI use group described a process of negotiation with AI-generated text in which they accepted language that did not fully represent their intended meaning because reformulating it to better express their own perspective required more effort than they were willing to invest. This pattern of cognitive offloading extended beyond linguistic surface features to

encompass the substantive intellectual content of the writing, suggesting that the risks of AI for authorial voice operate at the level of intellectual engagement rather than merely linguistic choice.

5. Discussion

The results of this study contribute to a growing body of research on the effects of generative AI on second language writing development. The findings suggest that the relationship between AI use and writing development is neither uniformly positive nor uniformly negative, but is shaped by how AI tools are used, the metacognitive awareness students bring to their use, and the institutional and pedagogical context (Song & Song, 2023; Marzuki et al., 2023). The finding that moderate AI use is associated with better outcomes across several dimensions of writing quality is particularly significant and is consistent with the concept of the zone of proximal development, which holds that learning is most effective when the level of challenge just exceeds the learner's current independent capability.

When AI assistance is used moderately and strategically, it may function as a scaffold allowing learners to operate slightly beyond their current independent writing ability while still engaging their own cognitive and linguistic resources. When AI assistance is used extensively, this scaffolding effect may collapse, with the AI substituting for rather than supporting the learner's development (Benson & Chik, 2021; Reinders, 2020). The effects of AI use on learner autonomy challenge simplistic narratives about AI tools either empowering or undermining student writers. The data suggest that AI tools are neither inherently autonomy-promoting nor autonomy-reducing, but that their effects are strongly mediated by the learner's existing orientation toward autonomous learning.

The implications for authorial voice are among the most concerning findings of this study. The systematic reduction in first-person epistemic markers and the pattern of over-hedging observed in texts produced by high AI users suggest that heavy AI reliance may be associated with a progressive depersonalisation of academic writing that undermines the development of disciplinary identity (Hyland, 2020). In postgraduate ESL contexts characterised by high writing anxiety and limited access to quality feedback, as documented by Khan et al. (2023) and Mahmood (2021), the risks of AI-induced voice erosion may be amplified by pre-existing instructional conditions that do not sufficiently support authorial stance development.

From a pedagogical perspective, writing instruction in the age of generative AI must attend more explicitly to the metacognitive dimensions of AI use, helping students develop the capacity to engage with AI tools critically and strategically. This implies a shift in instructional focus toward AI literacy in academic writing — comprising an understanding of how AI tools work, what their limitations are, and how to integrate their affordances into a genuinely autonomous writing process (Kasneci et al., 2023; Bozkurt, 2024). The ethical dimensions of AI use are also illuminated by the findings of this study. Perkins (2023) argued that institutions must develop more nuanced integrity policies that distinguish between different types and degrees of AI use, and provide students with clear guidance on the boundaries of acceptable assistance. In South Asian contexts specifically, Saleem et al. (2025) have shown that culturally aligned AI feedback paired with teacher facilitation produces the best outcomes, suggesting that context-sensitive policy development is essential.

6. Conclusion

This study has examined the impact of generative AI tool use on English academic writing quality, learner autonomy, and authorial voice among ESL postgraduate students. The findings reveal a complex picture in which the effects of AI use are strongly mediated by the manner in which tools

are used, the metacognitive awareness of users, and the disciplinary and institutional context. Moderate, strategic AI use appears to support writing quality and learner autonomy, while heavy, passive AI use is associated with reduced textual distinctiveness, lower writing self-efficacy, and diminished authorial voice.

These findings carry important implications for writing instruction, assessment practices, and academic integrity policies in postgraduate programmes serving ESL student populations. Writing instruction must evolve to include explicit attention to AI literacy, helping students develop the critical and metacognitive skills needed to use AI tools in ways that support rather than substitute for their own writing development (Kasneci et al., 2023). Assessment practices must be diversified to include process-oriented components that are difficult to complete with AI assistance alone, and academic integrity policies must be revised to provide more nuanced guidance on acceptable AI use (Bozkurt, 2024; Perkins, 2023).

Future research should track ESL postgraduate students over the course of their degree programmes, comparing developmental trajectories among students with different AI use patterns. The finding that prior writing experience, language confidence, and access to quality feedback moderate the effects of AI use suggests that equitable responses to the AI revolution in academic writing must be sensitive to the diversity of needs and learning trajectories that characterise real postgraduate student populations (Saleem et al., 2025; Benson & Chik, 2021). In conclusion, generative AI represents a transformative force in academic writing that demands coordinated effort from students, instructors, institutions, and policymakers, guided by rigorous empirical research conducted in authentic academic writing contexts.

References

1. Abdelhalim, S. M. (2022). An investigation into English majors' self-regulated writing strategies in an online learning context. Language Teaching Research, 26(3), 456–479. https://doi.org/10.1177/13621688221100296
2. Benson, P., & Chik, A. (2021). Learner autonomy in language learning: Bridging the research-practice gap. Language Teaching, 54(1), 45–62. https://doi.org/10.1017/S0261444820000397
3. Bozkurt, A. (2024). GenAI et al.: Co-creation, authorship, ownership, academic ethics and integrity in a time of generative AI. Open Praxis, 16(1), 1–10. https://doi.org/10.55982/openpraxis.16.1.654
4. Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. Qualitative Research in Sport, Exercise and Health, 11(4), 589–597. https://doi.org/10.1080/2159676X.2019.1628806
5. Creswell, J. W., & Plano Clark, V. L. (2018). Designing and conducting mixed methods research (3rd ed.). SAGE.
6. Deane, P. (2019). Rethinking the constructs underlying writing assessment. Written Communication, 36(4), 433–466. https://doi.org/10.1177/0741088319866431
7. Golonka, E. M., Bowles, A. R., Frank, V. M., Richardson, D. L., & Freynik, S. (2019). Technologies for foreign language learning: A review of technology types and their effectiveness. Computer Assisted Language Learning, 32(1), 70–105. https://doi.org/10.1080/09588221.2019.700315
8. Hyland, K. (2020). Disciplinary identities: Individuality and community in academic discourse (2nd ed.). Cambridge University Press.
9. Kasneci, E., Sessel, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., Gasser, U., Groh, G., Günnemann, S., Hüllermeier, E., Krusche, S., Kutyniok, G., Michaeli, T.,

Nerdel, C., Pfeffer, J., Poquet, O., Sailer, M., Schmidt, A., Seidel, T., … Kasneci, G. (2023). ChatGPT for good? On opportunities and challenges of large language models for education. Learning and Individual Differences, 103, Article 102274. https://doi.org/10.1016/j.lindif.2023.102274

10. Khalid, U., & Khan, S. (2026). Signing insights: Developing a computational prototype for Pakistani sign language analysis. *Wah Academia Journal of Social Sciences, 5*(1), 599. https://doi.org/10.63954/wajss.5.1.31.2026
11. Khan, J., Fareed, M., Khan, Z., & Akhter, H. (2023). Exploring English language learning needs of Pakistani ESL postgraduate research students: A qualitative study. Academy of Education and Social Sciences Review, 3(3), 298–309. https://doi.org/10.48112/aessr.v3i3.548
12. Mahmood, K. (2021). Academic writing challenges of EFL learners and teachers' proficiency in Pakistani higher education. Journal of Research in Social Sciences, 9(1), 56–76. https://doi.org/10.52015/jrss.8i2.55
13. Marzuki, M., Widiati, U., Rusdin, D., Darwin, D., & Indrawati, I. (2023). The impact of AI writing tools on the content and organisation of students' writing: EFL teachers' perspective. Cogent Education, 10(2), Article 2236469. https://doi.org/10.1080/2331186X.2023.2236469
14. Perkins, M. (2023). Academic integrity considerations of AI large language models as writing tools for students in higher education: The case of ChatGPT. Higher Education Research & Development, 42(2), 369–383. https://doi.org/10.1080/07294360.2023.2183179
15. Rasool, U., Qian, J., & Aslam, M. Z. (2023). An investigation of foreign language writing anxiety and its reasons among pre-service EFL teachers in Pakistan. Frontiers in Psychology, 13, Article 947867. https://doi.org/10.3389/fpsyg.2022.947867
16. Reinders, H. (2020). Autonomy, technology, and language learning: Principles and practice. Language Learning & Technology, 24(3), 1–10. https://doi.org/10125/44730
17. Saleem, T., Saleem, A., Aslam, M., & Enayat, M. J. (2025). Integrating AI in Pakistani ESL classrooms: Teachers' practices, perspectives, and impact on student performance. PLOS ONE, 20(9), Article e0333352. https://doi.org/10.1371/journal.pone.0333352
18. Song, C., & Song, Y. (2023). Enhancing academic writing skills and motivation: Assessing the efficacy of ChatGPT in AI-assisted language learning for EFL students. Frontiers in Psychology, 14, Article 1260843. https://doi.org/10.3389/fpsyg.2023.1260843
19. Stokel-Walker, C. (2022). AI bot ChatGPT writes smart essays — should professors worry? Nature. https://doi.org/10.1038/d41586-022-04397-7
20. Yan, D. (2023). Impact of ChatGPT on learners in a L2 writing practicum: An exploratory investigation. Education and Information Technologies, 28, 13943–13967. https://doi.org/10.1007/s10639-023-11742-4