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AI Writing Tools as Catalysts for L2 Writing Development: A Quantitative Investigation of Students' Experiences

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Abstract

The advent of Artificial Intelligence (AI) writing tools as catalysts of language development has revolutionised the domain of Second Language (L2) writing instruction. These advanced technologies, such as ChatGPT and QuillBot, promote writing growth by providing immediate feedback, creative support, and specific improvement recommendations, allowing L2 students to enhance their writing skills more efficiently. The importance of these catalytic tools has increased significantly in educational settings, notably aiding L2 learners who face difficulties in writing development. This quantitative study analysed L2 students' experiences with AI writing tools and assessed their transformative impact on academic writing advancement. The study employed a comprehensive questionnaire-based methodology to examine students' interaction patterns with AI technologies and their reported effects on writing growth. The study especially investigated how these tools facilitated advancements in essential writing skills, encompassing vocabulary expansion, syntactic development, rhetorical organisation, and stylistic refinement. The thorough examination of L2 student experiences demonstrated that AI tools enhanced creative expression, refined writing style, and maintained engagement in the writing process. The findings indicated that AI writing tools acted as excellent catalysts for L2 writing development, especially in skill progression, quality improvement, and writing efficiency. The tailored feedback and structured assistance offered by these technologies greatly enhanced L2 students' writing confidence and proficiency. This study emphasises the pivotal function of AI tools in modern L2 writing education, showcasing their capacity to enhance academic writing proficiency among L2 learners.

Keywords: AI Writing Tools, Writing Development, L2 Learners

Introduction

The landscape of academic writing support has undergone remarkable transformation with the rise of Artificial Intelligence (AI) writing tools. Innovations such as ChatGPT and QuillBot

have revolutionized content creation by offering advanced functionalities for grammar refinement, idea organization, and content enhancement (Al-Garawany, 2024; Suharto et al., 2025). Recent studies demonstrate that AI-assisted writing tools can substantially enhance students' vocabulary acquisition and grammatical accuracy compared to traditional writing methods, while also notably reducing the time spent on revision processes (e.g., Mahapatra, 2024; Marzuki et al., 2023; Zhao, 2022). For Second Language (L2) learners (especially low-proficient learners), who often face significant challenges in academic writing, these AI-powered tools provide essential assistance for skill development and writing improvement (Mahapatra, 2024). Recent research also highlights that L2 learners using AI writing tools demonstrate notable advancements in areas like syntactic complexity, lexical variety, and overall text coherence (see Al-Mahmud, 2023; Suharto et al., 2025; Ziar, 2023; Zulfa et al., 2023). Additionally, these tools have been found to boost students' confidence in their writing capabilities while alleviating the stress commonly associated with academic writing tasks (Chong, 2021; Selim, 2024). Thus, the integration of AI writing tools has emerged as a transformative force in academic writing pedagogy, not only enhancing the technical aspects of writing but also fostering a more supportive and confidence-building environment for both native and non-native writers.

L2 learners in academic settings have consistently faced challenges such as grammatical errors, limited vocabulary, and difficulties in organizing their ideas (Al-Garawany, 2024; Selim, 2024). These persistent obstacles not only compromise their academic success but also diminish their confidence in written communication (Rahimi & Zhang, 2018; Hanauer et al., 2019; Ziar, 2023). However, the advent of AI writing tools marks a transformative breakthrough in addressing these issues. By providing instant feedback, inspiring creative thought, and delivering personalized suggestions, these tools empower learners to produce polished, cohesive content with unprecedented ease (Suharto et al., 2025). More than just enhancing writing proficiency, this technological innovation democratizes access to high-quality support, dismantling both technical and emotional barriers that have long impeded academic growth for L2 learners. The result is not merely improved writing skills but a profound shift toward equitable opportunities, enabling learners to thrive and compete on a level playing field.

In addition, the growing presence of AI writing tools in education is reshaping how students approach academic tasks, yet it is still lacking a clear understanding of how L2 learners harness these tools and their influence on writing development (Mahapatra, 2024; Su et al., 2023). While research has delved into technology-enhanced writing education (Mahapatra, 2024; Marzuki et al., 2023; Zhao, 2022), a critical question remains: how exactly do L2 learners engage with AI tools, and how effective are these tools in sharpening their writing skills? Exploring this issue is more urgent than ever, as AI technologies increasingly define modern education, where strong writing abilities are vital across all fields (Suharto et al., 2025). Therefore, analysing how L2 learners interact with AI writing tools and their impact on writing development is crucial for enhancing these technologies for language learning and ensuring their effective integration into educational practices.

This study delves into two pivotal areas: the utilization patterns of AI writing tools among L2 learners and their impact on writing development in academic contexts. It seeks to explore the following questions:

1. How are L2 learners leveraging AI writing tools for academic purposes?
2. What impact do AI writing tools have on L2 learners' writing development in academic contexts?

This study offers valuable insights for stakeholders in L2 writing instruction, paving the way for transformative teaching and learning. By exploring how students utilize AI writing tools, educators can refine their methods and seamlessly integrate technology into their classrooms. These findings also provide a foundation for shaping institutional policies that embrace AI tools in academic programs. Beyond enhancing current practices, this research contributes to the growing field of technology-assisted language learning and sparks opportunities for future exploration into AI-driven writing development.

Literature Review

L2 Writing in Digital Era

The digital era has brought about transformative changes in the field of L2 writing, as evidenced by the unprecedented integration of technology and the evolution of educational methodologies (Li & Li, 2022). The emergence of generative AI technologies has further accelerated this transformation, profoundly reshaping the way L2 learners approach writing tasks and how instructors evaluate written work, by building upon this digital foundation (Li et al., 2025). While the integration of digital tools has improved the writing proficiency of students at all educational levels, it has also introduced new complexities in the assessment and feedback processes (Ramadhan et al., 2024). The development of students' critical AI literacy (CAIL) is a critical component of this evolution. As learners navigate AI-assisted writing environments and develop metacognitive awareness of their writing processes, CAIL has become increasingly important (Levin et al., 2025). As a result, this digital transformation has prompted educators to reassess traditional assessment frameworks, necessitating a meticulous equilibrium between the use of AI-enhanced writing tools and the preservation of pedagogical integrity (Chapella, 2024). Recent research has underscored the significance of a balanced approach that not only capitalises on technological capabilities but also cultivates students' autonomous writing abilities and preserves authentic learning experiences (Li & Li, 2022). Thus, it is imperative to conduct ongoing research in order to develop effective pedagogical strategies that can optimise the advantages of digital tools and resolve the emerging challenges in L2 writing instruction and assessment as this dynamic landscape continues to evolve.

Digital Transformation of L2 Writing

The digital revolution has significantly altered the writing practices of L2 writers, introducing new dimensions of online collaboration and digital creation (Li & Li, 2022). Building on this foundation, automated assessments and corpus tools are integral components of contemporary writing environments, which promote a globally connected and interactive learning experience. This transformation has been particularly advantageous to L2 learners, as it has granted them unparalleled access to linguistic resources and writing support tools (Godwin-Jones et al., 2024). In addition, recent research has demonstrated that Automated Writing Evaluation (AWE) systems have developed to offer feedback mechanisms that are increasingly sophisticated, thereby assisting learners in enhancing their writing accuracy and fluency while simultaneously reducing apprehension during the writing process (Yan & Zhang, 2024). Similarly, the writing support landscape has been significantly transformed by the emergence of generative AI tools, which have allowed L2 writers to engage in interactive

writing practice that fosters both linguistic and rhetorical development and receive immediate, contextualised feedback (Shi et al., 2025; Wang et al., 2024). Furthermore, research suggests that these digital tools not only improve the technical aspects of writing but also promote learner autonomy and metacognitive awareness. Students actively interact with automated feedback systems to refine their writing strategies (Liu, 2024). As a result of these developments, this technological advancement has also resulted in the creation of multimodal writing environments that accommodate a variety of learning styles and preferences, thereby enhancing the accessibility and engagement of the writing process for L2 learners of varying proficiency levels (Godwin-Jones, 2024).

AI's Impacts on L2 Writing Development

The landscape of language acquisition and writing has been drastically altered as a result of the digital revolution of writing when learning an L2. This change has created opportunities for interactive and collaborative writing experiences that have never been seen before, as Li and Li (2022) pointed out in their initial observation. This transition has been accelerated by the implementation of artificial intelligence technology, which has led to the creation of sophisticated learning environments that combine conventional instructional methods with cutting-edge digital tools (Godwin-Jones, 2024). It is primarily through the enhancement of access to linguistic resources and real-time writing support tools that these improvements have been of assistance to L2 learners.

The feedback process in L2 writing instruction has been completely transformed as a result of the development of AWE systems and writing tools powered by AI. The research conducted by Yan and Zhang (2024) indicates that these systems have shown extraordinary effectiveness in lowering anxiety associated with writing while simultaneously enhancing accuracy and fluency. By giving rapid, contextualised feedback that supports both linguistic and rhetorical development, the incorporation of generative AI tools has further strengthened this development (Shi et al., 2025; Wang et al., 2024). These technical advancements have resulted in the creation of writing environments that are more accessible and interesting, and that can suit a variety of learning styles and degrees of expertise.

At the same time, however, this digital change has also brought about new challenges and considerations for both teachers and students. Ramadhan et al. (2024) highlight the complexity that have evolved in the assessment and feedback processes as a result of the use of digital instruments. As underlined by Levin et al. (2025), the ability to critically comprehend and evaluate artificial intelligence systems has become more crucial. This is especially true as learners navigate environments that aid them in writing with the assistance of AI and gain metacognitive awareness of their own writing processes. It is pointed out by Liu (2024) that although these digital tools improve certain parts of technical writing, they also encourage learner autonomy and metacognitive growth by means of active involvement with automated feedback systems. Therefore, the successful incorporation of digital technologies in L2 writing education necessitates a delicate balance between utilising technology affordances and developing students' critical awareness and independent learning abilities.

It is necessary to strike a careful balance between technical innovation and pedagogical integrity in order to ensure the future of L2 writing teaching. Chapella (2024) makes the case

that it is essential to reevaluate the conventional assessment frameworks while preserving the authenticity of the educational system. The maintenance of this equilibrium is essential in order to maximise the benefits of digital technologies while simultaneously sustaining authentic learning experiences. As the area continues to expand, current research needs to concentrate on building effective pedagogical practices that maximise the benefits of integrating AI while also addressing increasing obstacles in the teaching and evaluation of L2 writing.

Within the realm of language instruction, this technological revolution in the development of L2 writing constitutes a huge step forward. Nevertheless, the success of this endeavour is ultimately contingent on the implementation of it in a thoughtful manner that takes into account both the technological capabilities and the fundamental principles of writing education. Under the condition that educators and researchers continue to place their emphasis on pedagogical effectiveness and learner growth, the continued development of AI in L2 writing instruction holds the promise of even greater potential for improving learning outcomes. Moving forward, the most important thing is to make sure that these technology improvements are utilised in a way that serves to enhance, rather than replace, the fundamental components of effective writing teaching.

Technology Acceptance Model (TAM)

The technology acceptance model (TAM) serves as the study's theoretical framework. Davis (1989) established TAM, which has emerged as a foundational framework for analysing humans' technology adoption behaviours. The paradigm contends that real technology usage is mostly determined by users' attitudes towards technology, which are substantially affected by two critical constructs: Perceived Usefulness (PU) and Perceived Ease of Use (PEU). PU includes users' views about how a certain technology would improve their performance outcomes, whereas PEU reflects users' expectations about the amount of effort required to effectively use the technology (Davis, 1989). These two variables operate together to influence users' attitudes and subsequent behavioural intentions, resulting in real technology usage patterns. In the context of this study, TAM provides a strong theoretical framework for investigating L2 learners' adoption and use of AI writing tools in academic settings.

Methodology

Research Approach

The study's data were gathered utilising a quantitative research methodology with a non-experimental design that included a questionnaire survey. In several academic disciplines, quantitative research is commonly used to analyse trends, evaluate hypotheses, and make forecasts (Zyoud et al., 2024). Questionnaire surveys are a prominent data collection strategy in academic research (Regmi et al., 2016). The non-experimental approach was selected as it allows for the observation of variables in their natural state without manipulation, making it particularly suitable for examining L2 learners' authentic experiences with AI writing tools in academic settings. This methodological approach, applied to a focused sample of 61 L2 learners, enabled the collection of detailed quantitative data about students' experiences with AI writing tools, providing valuable insights while acknowledging the limitations of the sample size in terms of broader generalizability.

Instrument

The questionnaire survey was employed to gather data on students' utilisation of AI writing tools, examining their influence on multiple facets of writing, such as skill enhancement, error detection, quality improvement, and time efficiency. This survey was created using Google Forms and disseminated to a cohort of students enrolled in a writing course at an educational institution through the WhatsApp application. The questionnaire has three sections: Part A for the students' demographic information (item no. 1), Part B for AI Writing Tool Usage (items no. 2 & 3) and Part C for the survey items (items 4 to 21). For Part C, a five-point Likert Scale was employed, where respondents were asked to state their opinion on the statements by choosing one of five responses: *strongly disagree, disagree, neutral, agree or strongly agree*. The 17 items of Part B were divided into six themes:

Theme 1: Improvement of Fundamental Writing Skills (items no. 1, 3, 5 & 8)
Theme 2: Language Mechanics and Accuracy (items no. 2, 4, 9 & 14)
Theme 3: Organizational and Structural Competence (items no. 7, 10, 11 & 16)
Theme 4: Writing Process and Refinement (items no. 12, 13 & 15)
Theme 5: Academic Writing Support (items no. 12 & 17)
Theme 6: Motivational Aspect of AI Writing Tools (item no. 6)

The students were chosen using convenience sampling to offer a representation of AI utilisation within the student demographic. The survey was structured to require roughly 10-15 minutes for completion, ensuring that the questions were succinct and aligned with the research objectives.

Data Analysis

The survey data from 61 participants were analyzed using descriptive statistical analysis, which included frequency distributions and percentages to systematically examine L2 learners' experiences with AI writing tools.

Findings and Discussion

The results of the descriptive statistical analysis of survey responses from 61 participants uncovered compelling patterns in students' experiences of AI writing tools in relation to the Technology Acceptance Model (TAM) framework. According to the analysis of AI writing tool adoption among the students, there was ubiquitous engagement, as 100% of the students reported active use of these technologies in their writing practices. ChatGPT was the most favoured instrument, with more than seventy percent (73.8%, n=45) of respondents utilising this platform. This underscores its substantial influence on the L2 writing landscape. Canva achieved the second position after ChatGPT, with approximately one-third (32.8%) of users (n=20). This indicates that Canva is effective in facilitating multimodal writing tasks. Grammarly was employed by a lesser portion of the population (11.5%, n=7), while Quillbot was moderately adopted, with approximately 25% of respondents (26.2%, n=16) utilising it. Other AI writing tools were utilised by only a small percentage of respondents (1.6%, n=1). The distinct dominance of ChatGPT in this distribution is consistent with the current trends in AI-assisted writing, whereas the varying adoption rates of other tools indicate that students utilise multiple platforms to support various aspects of their writing process. This usage pattern suggests a sophisticated approach to digital writing assistance, in which learners strategically select tools based on specific writing needs and requirements. Table 1 shows the students' AI writing tool usage.

Table 1
AI Writing Tool Usage of the Students

Popular AI Tools	**Percentage %**
ChatGPT	73.8
Canva	32.8
Quillbot	26.2
Grammarly	11.5
Others	1.6

Theme 1: Improvement of Fundamental Writing Skills

The theme of Improvement of Fundamental Writing Skills (consisting of writing skills, writing quality & effectiveness and writing style) was the most positively perceived, with an impressive overall theme average 95.90% of respondents signifying agreement (consisting of *Agree* and *Strongly Agree* responses). The majority of students in this study, 98.36%, reported improvements in their general writing skills, with 73.77% strongly agreeing and 24.59% agreeing. There were minimal neutral responses (1.64%) and no negative feedback. This robust positive perception is consistent with Godwin-Jones's (2024) observations concerning the "unparalleled access to linguistic resources and writing support tools" that contemporary L2 writing environments offer. The results can be effectively interpreted using Davis's (1989) TAM framework, specifically the constructs of Perceived Usefulness (PU) and Perceived Ease of Use (PEU), which demonstrate significant positive acceptance across multiple dimensions of writing development. The perceived efficacy of AI writing tools in fostering fundamental writing abilities is further bolstered by the absence of negative responses and minimal impartial feedback, which indicates a substantial paradigm shift in the transformation of L2 writing instruction and skill development by technology. Table 2 shows the findings.

Table 2
Improvement of Fundamental Writing Skills

Aspect	**Total Positive Response**	**Strongly Agree**	**Agree**	**Neutral**	**Negative**
General writing improvement (i.e., writing skills, quality & effectiveness, style)	98.36%	73.77%	24.59%	1.64%	-

Theme 2: Language Mechanics and Accuracy

The strong positive answers in Language Mechanics and Accuracy (93.44% average positive responses) are consistent with recent advances in Automated Writing Evaluation (AWE) systems presented by Yan and Zhang (2024). The high level of support for spelling and grammar assistance (93.44%) and vocabulary enhancement (95.08%) demonstrates the successful integration of AI tools in providing sophisticated feedback mechanisms that, according to Shi et al. (2025) and Wang et al. (2024), foster both linguistic and rhetorical development through immediate, contextualised feedback. This high positive opinion is consistent with the developing capabilities of AI-powered writing tools, particularly their capacity to deliver real-time, contextually relevant edits and suggestions. The strong approval

rates indicate that students value these tools for addressing surface-level language issues, allowing them to focus on higher-order writing skills. These tools' usefulness in improving language mechanics is enhanced by their capacity to provide explanations in addition to corrections, allowing for a more in-depth comprehension of language rules and usage patterns. Furthermore, the tools' ability to suggest alternate vocabulary and phrasings appears to have a considerable impact on students' lexical development and style refinement. The continuously high positive answers for both mechanical correctness and vocabulary enhancement suggest that AI writing tools are successfully addressing traditionally difficult parts of L2 writing development. These findings highlight the transformative role of AI-powered feedback systems in modern language learning, implying that these tools have become essential components of students' writing development processes, effectively closing the gap between mechanical accuracy and meaningful language acquisition. Table 3 illustrates the findings.

Table 3
Language Mechanics and Accuracy

Aspect	Positive Response	Details
Spelling & Grammar Assistance	93.44%	Corresponds with AWE systems development (Yan & Zhang, 2024)
Vocabulary Enhancement	95.08%	• Real-time corrections • Contextual suggestions • Explanations with corrections
Overall theme average	93.44%	• Alternative vocabulary suggestions • Stylistic refinement • Phrasal improvements

Theme 3: Organizational and Structural Competence

The findings concerning Organisational and Structural Competence, which received an average of 90.58% positive responses, correspond with the observations made by Li and Li (2022) regarding the exceptional integration of technology in L2 writing. The observed decline in strong agreement for more complex tasks, including paragraph and essay writing (80.33%), indicates the challenges (e.g., ethical concerns, over-reliance on technology, reduced creativity, feedback accuracies etc.) highlighted by Ramadhan et al. (2024) concerning the intricacies of assessment and feedback mechanisms in digital writing contexts. This pattern of responses indicates that AI writing tools are generally viewed favourably regarding structural elements, yet their effectiveness differs depending on the complexity of the writing involved. The lower endorsement rate for complex writing tasks suggests that students may encounter difficulties in effectively utilising AI tools when faced with higher-order organisational demands. This finding is significant as it underscores a potential limitation in existing AI writing assistance technology, which tends to excel in micro-level organisation but may struggle with macro-level structural elements. The difference between simpler and more complex writing tasks indicates that students may need further guidance or training to fully leverage AI tools for advanced writing assignments. Notwithstanding these discrepancies, the 90.58% positive response rate suggests that, although confidence may decline with assignment difficulty, students typically find AI tools useful for improving their organisational

and structural writing skills. The data indicates a pattern in which students increasingly depend on AI assistance for fundamental structural elements, while adopting a more cautious stance towards complex organisational tasks. This may suggest a growing awareness of the capabilities and limitations of these technological tools. These findings highlight the necessity of a balanced approach in the implementation of AI writing tools, integrating technological support with traditional pedagogical methods, especially for the enhancement of advanced writing skills and the management of complex organisational structures in L2 writing development. Table 4 shows the findings.

Table 4
Organisational and Structural Competence

Aspect	**Positive Response**
Complex tasks (paragraph & essay writing)	80.33%
Overall theme average	90.58%

Theme 4: Writing Process and Refinement

The Writing Process and Refinement reveal compelling patterns that resonate with L2 writing and technology integration literature. Li and Li (2022) emphasize the transformative impact of digital technologies on writing development, with an impressive 87.98% favorable response rate. Notably, text refinement garnered a remarkable 91.81%, where 57.38% strongly agreed and 34.43% agreed. This underscores the growing reliance on technology to enhance writing precision and fluency. Yan and Zhang (2024) further highlight the role of Automated Writing Evaluation (AWE) systems in boosting writing accuracy and fluency. These systems not only refine technical aspects but also encourage users to critically assess their limitations, fostering a deeper understanding of their capabilities. Interestingly, subtler writing qualities see a gradual decline in *Strongly Agree* ratings, reflecting theoretical insights. Levin et al. (2025) advocate for the development of Critical AI Literacy (CAIL), urging cautious use of AI tools as tasks become more complex. Their findings align with Shi et al. (2025) and Wang et al. (2024), whose research on generative AI tools reveals users' growing awareness of limitations in handling intricate writing tasks, despite the contextual benefits these tools provide. The Technology Acceptance Model (TAM) by Davis (1989) sheds light on students' perception of Perceived Usefulness (PU) and Perceived Ease of Use (PEU). Chapella (2024) emphasizes the need to balance technological innovation with pedagogical integrity, highlighting students' ability to distinguish between basic and advanced writing activities. Similarly, Godwin-Jones (2024) advocates for multimodal writing environments that accommodate diverse learning styles while ensuring meaningful engagement with technology. Ramadhan et al. (2024) observe the increasing complexity of digital evaluation and feedback systems, a trend supported by empirical data. Liu (2024) notes that digital tools enhance technical writing skills and empower learners through automated feedback mechanisms. These insights align with Li et al. (2025), who explore how generative AI technologies are reshaping L2 learners' writing tasks while cultivating critical awareness of their limitations. Ultimately, students demonstrate a sophisticated and nuanced perspective on AI writing tools. While they express strong overall endorsement, scepticism rises as tasks grow more intricate. This pattern echoes the literature’s emphasis on balancing technological assistance with autonomous writing development. It suggests that students are developing advanced strategies to integrate AI tools into their writing processes, all while maintaining

critical awareness of their limitations and appropriate usage contexts. Table 5 shows the findings of this theme.

Table 5
Writing Process and Refinement

Aspect	Response Type (%)
Text refinement	Strongly Agree (57.38) Agree (34.43)

Theme 5: Academic Writing Support

The Academic Writing Support theme received the lowest, but still favourable, response rates of all themes, with an average positive response rate of 77.87%. Within this theme, reference management received the lowest endorsement at 72.13% (with 44.26% strongly agreeing and 27.87% agreeing), as well as the highest proportion of neutral (18.85%) and negative responses (3.28%), indicating students' more reserved attitude towards AI tools for specialised academic writing tasks. This pattern demonstrates substantial developments that are consistent with the present literature on L2 writing and technological integration. This more cautious response rate, combined with the highest number of indifferent (18.85%) and negative replies (3.28%), is consistent with Davis's (1989) Technology Acceptance Model (TAM), indicating that students perceive lesser utility and simplicity of use for specialised academic writing activities. This pattern is consistent with Li and Li's (2022) focus on the importance of balanced technological integration, particularly in academic situations where instructional integrity is critical, as noted by Chapella (2024). The findings also complement Levin et al.'s (2025) Critical AI Literacy (CAIL) study, which found that students maintain heightened critical awareness when using AI tools for hard academic work. The comparatively low endorsement rates for academic writing support reflect Ramadhan et al.'s (2024) views on the complexity of evaluation and feedback processes in digital contexts, particularly for specialised academic tasks. This measured approach to AI tools in academic writing contexts is consistent with Yan and Zhang's (2024) findings on AWE systems, which suggest that, while these tools can improve basic writing aspects, students recognise their limitations in more complex academic writing tasks. Furthermore, the pattern reflects Godwin-Jones' (2024) and Liu's (2024) observations about the importance of preserving learner autonomy and critical engagement with digital tools, especially in academic contexts where specialised knowledge and skills are required, ultimately supporting Li et al.'s (2025) findings about how students strategically integrate AI tools while remaining aware of their limitations in academic writing contexts. These findings suggest that, while AI tools are generally well-received for writing support, students take a more discerning and cautious approach when applying these technologies to specialised academic writing tasks, indicating a sophisticated understanding of both AI's potential and limitations in academic settings. Table 6 illustrates the findings.

Table 6
Academic Writing Support

Aspect	Response Type (%)
Reference management	Strongly Agree (44.26) Agree (27.87)
Theme-wide responses	Neutral responses (18.85) Negative responses (3.28)

Theme 6: Motivational Aspect of AI Writing Tools

The Motivational Aspect of AI Writing Tools had notably strong favourable feedback from students, with 86.88% responding favourably to increased motivation in writing. This high endorsement percentage, with 49.18% strongly agreeing and 37.70% agreeing, demonstrates that students recognise the motivational benefits of AI tools in their writing practice. The findings are consistent with Li and Li's (2022) observations about the transformative impact of digital technology on writing development. The distribution pattern of *Strongly Agree* (49.18%) and *Agree* (37.70%) responses indicates a measured but positive attitude towards AI writing tools. This balanced distribution reflects Chapella's (2024) emphasis on preserving educational integrity while capitalising on technological advances. The trend also corresponds to Liu's (2024) findings on how digital tools improve learner autonomy and metacognitive awareness, implying that students take a deliberate approach to integrating AI technologies into their writing practice. The findings are also consistent with Davis's (1989) Technology Acceptance Model (TAM), suggesting that students have high levels of perceived usefulness (PU) and perceived ease of use (PEU). This theoretical consistency is reinforced by Godwin-Jones' (2024) research on how digital tools make writing settings more accessible and engaging. The findings are also consistent with Levin et al.'s (2025) work on Critical AI Literacy (CAIL), indicating that students are developing a comprehensive knowledge of AI tools' role in their writing growth while remaining critical of their implementation. The high overall positive response rate, together with the assessed dispersion of reaction levels, implies that, while AI tools considerably increase writing motivation, students approach their integration in a balanced and careful manner. This conclusion is consistent with Li et al.'s (2025) observations concerning the changing nature of L2 writing in AI-enhanced contexts, and it supports Ramadhan et al.'s (2024) focus on the importance of carefully considering assessment and feedback processes in digital writing environments. The findings show that AI technologies successfully promote motivation while maintaining students' critical participation in their writing progress. Table 7 illustrates the findings of the theme.

Table 7
Motivational Aspect of AI Writing Tools

Response Type	Percentage (%)	Interpretation
Strongly Agree	49.18	demonstrates a strong positive experience of AI tools' motivational impact
Agree	37.7	shows robust yet cautious endorsement of AI's motivational advantages
Total positive response	86.88	indicates a strong endorsement of AI's motivational role

According to the data and discussions presented, the answers to the study's research questions are as follows:

RQ1: How are L2 learners leveraging AI writing tools for academic purposes?

The study indicates that L2 learners are employing a refined and strategic methodology to utilise AI writing tools in their academic writing endeavours. ChatGPT has become the preferred tool, with 73.8% of students actively employing this platform, underscoring its substantial influence on their writing process. This is supplemented by Canva (32.8%) for multimodal writing activities, and Quillbot (26.2%) and Grammarly (11.5%) provide more specialised writing enhancement functions. This varied selection of tools indicates that students are cultivating a sophisticated comprehension of the capabilities of different AI tools and are deliberately choosing them according to certain writing requirements. The results also reveal that students utilise a hierarchical strategy in their use of AI tools, exhibiting significant engagement with these technologies for basic writing activities, while adopting a more cautious and selective approach for intricate academic assignments. This strategic usage pattern indicates that learners are cultivating an advanced understanding of when and how to effectively include AI aid into their writing process. The elevated positive response rates for fundamental writing mechanics and linguistic precision (93.44%) suggest that students predominantly utilise these resources for basic writing assistance, while demonstrating a more cautious application in specialised academic writing endeavours (77.87%). Students' experience for integrating AI technologies demonstrates a distinct pattern of task-specific utilisation, with tools being strategically deployed according to the complexity and demands of various writing assignments. The strong favourable comments on organisational and structural characteristics (90.58%) indicate that students are effectively employing AI tools to improve their writing structure and organisation. Nonetheless, the more prudent approach to intricate academic assignments suggests that students retain a critical awareness of these technologies' limitations and modify their utilisation accordingly. This strategic and discerning approach to the use of AI tools illustrates that L2 learners are evolving into knowledgeable and critical users capable of effectively balancing the advantages of AI assistance with the requirements of academic writing, rather than employing a uniform approach to these technological resources.

RQ2: What impact do AI writing tools have on L2 learners' writing development in academic contexts?

The influence of AI writing tools on L2 learners' writing progress is evident across various dimensions, exhibiting differing levels of efficacy in distinct facets of academic writing. The most important beneficial effect is on basic writing skills. An amazing 98.36% of students said their general writing skills got better. This is further reinforced by a significant improvement in vocabulary (95.08%) and language mechanics and accuracy (93.44%). These results indicate that AI technologies are very proficient in reinforcing the fundamental components of academic writing. The study also shows that students' structural and organisational skills have improved a lot; 90.58% said they could better organise their writing tasks. The fact that 91.81% of people said they liked the text refinement features shows that AI tools are helping students improve the overall quality of their writing. Moreover, the tools exhibit a considerable motivational influence, with 86.88% of students indicating heightened interest and engagement in writing assignments, implying that AI tools are not just improving technical skills but also cultivating favourable attitudes towards writing development.

However, the effect is more complicated in advanced academic writing situations. The study finds areas where it fails as well, such when it comes to specialised academic writing jobs and

reference management, where the favourable response rate lowers to 72.13%. This decrease in effectiveness as task difficulty rises indicates that AI tools substantially aid basic and intermediate writing growth, although their influence on advanced academic writing skills is relatively limited. The overall developmental impact suggests that AI tools are useful tools for L2 writing development, especially when it comes to improving basic skills and encouraging self-directed learning. However, their usefulness is maximised when incorporated into a holistic writing development strategy that encompasses conventional pedagogical techniques while fostering a critical understanding of the tools' limitations. In conclusion, this multifaceted pattern of influence highlights the necessity of perceiving AI writing tools not as independent solutions but as supplementary resources that, when strategically combined with conventional teaching methods, can effectively aid L2 learners' writing development while recognising the requirement for further support and instruction in more sophisticated academic writing tasks.

Conclusion and Recommendations

This quantitative study of students' experiences clearly shows that AI writing tools do help L2 writing growth, but they work better in some areas than others. The catalytic effect of these tools is most seen in how quickly students learn basic writing abilities. More than 90% of students said they made big gains in areas like vocabulary, structure, and language accuracy. When looking at more difficult academic writing assignments, though, the catalyst metaphor gets more complicated. The tools' catalytic effect is more selective and needs to be carefully adjusted. The study's findings, based on direct student experiences, indicate that these AI tools function not as universal accelerants but as selective catalysts, particularly effective in initiating and expediting fundamental writing skill development, while necessitating more strategic application in advanced academic contexts. This pattern fits effectively with the study's title, which suggests that the tools are catalytic because they lower initial barriers and speed up learning without changing the basic ways that writing skills develop.

To leverage these findings, educational institutions must implement a three-pronged strategy for AI integration in L2 writing instruction. Initially, thorough frameworks must be developed to explicitly define suitable AI tool utilisation across various writing jobs and ability levels. These frameworks must properly delineate the shift from fundamental to advanced writing tasks, offering precise recommendations for both students and instructors on effectively using AI aid while upholding academic integrity. Secondly, professional development programs must be instituted to furnish educators with the requisite skills and expertise to assist pupils in using AI tools. This training should focus on both the technical features of AI tools and the pedagogical methods for their useful integration into writing teaching. Moreover, educators must be equipped to assist students in managing the essential transition from AI-assisted foundational writing to more autonomous advanced academic writing. Third, curriculum developers ought to integrate AI literacy as an essential element of L2 writing courses. This integration should emphasise the cultivation of students' critical evaluation skills and the enhancement of their comprehension of AI tools' potential and limits. Furthermore, evaluation criteria must be updated to align with the changing dynamics of writing in an AI-augmented context, while upholding stringent academic standards. To maintain efficacy, these guidelines must be underpinned by continuous research, especially longitudinal studies investigating the enduring effects of AI tool use on L2 authors' progression. As AI technologies

advance, the continual assessment and revision of integration tactics will be crucial to ensure their pertinence and efficacy in facilitating L2 learners' writing progress.

To conclude, the metaphor of AI writing tools as catalysts, which is the main idea of this study, has shown out to be very accurate based on the quantitative findings on students' experiences. AI writing tools speed up and improve L2 writing development without taking the place of the basic learning process, just how catalysts in chemical reactions help but not replace key processes. Going forward, the key to successful integration is knowing how to use these technologies' catalytic capabilities in an effective manner, with the help of well-planned institutional frameworks, knowledgeable teacher assistance, and enhanced student literacy in how to use AI tools. This balanced approach will make sure that AI writing tools live up to their potential as real catalysts for L2 writing development, speeding up learning while keeping the educational process honest in a world where technology is becoming more and more common in schools.

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