

University EFL Learners' Perceptions on the Use of ChatGPT in Academic Writing Learning Process

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ABSTRACT

With the burgeoning development of sophisticated artificial intelligence tools, it is of foremost importance for second language educators to integrate these digital learning platforms into their regular classroom settings, as they will help them deliver clearer pedagogical instructions and design more effective learning materials. Concerning the aforesaid background, the researchers undertook this moderate library study to investigate university EFL learners' perceptions of the use of ChatGPT in the academic writing learning process. In compliance with this major study objective, the researchers employed a thematic analysis approach while reviewing pertinent findings derived from 30 previously published ChatGPT journal articles. With the help of a thematic analysis approach, the researchers could generate more believable, trustworthy, and relatable findings, as it supported us in subsuming the targeted results into relevant themes. The thematically-categorized research results revealed that ChatGPT allowed the enhancement of writing accuracy, proficiency, strategic competence, motivation, confidence, and positive writing dispositions among global university EFL learners.

Keywords: *Artificial intelligence tools; university EFL learners; ChatGPT; library study; thematic analysis*

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INTRODUCTION

With rapid development in artificial intelligence tools, second language educators have the chance to transform classroom dynamics. Liang et al. [1] highlight the importance of involving EFL learners worldwide in AI-based learning, offering them limitless chances to deepen their understanding of class topics. ChatGPT stands out among these AI tools. It has gained much attention from language education experts in the last decade due to its adaptable and practical use in diverse classrooms. Kostka and Toncelli [2] support this, stating that ChatGPT helps EFL learners improve language skills by giving them unlimited access to new knowledge, information, and skills at any time and place.

Invented in November 2022, ChatGPT played an essential role in promoting a more seamless learning process in global second-language classroom settings. The occurrence of this positive educational outcome is rigorously impacted by the presence of human-like technological features forming in ChatGPT, allowing each user to obtain a more comprehensive understanding of the topical knowledge they are searching for. This meritorious value is closely linked to Song and Song [3], confirming that in the light of ChatGPT, learners will be put at ease while accomplishing a vast array of complex learning tasks since their perspectives are consistently enriched with useful, insightful, and relevant

conceptions. In modern EFL classroom learning contexts, ChatGPT also paves an enlightening pathway for target language learners to experience an anxiety-free and less-stressful classroom atmosphere. This coveted learning event is more likely to take place since ChatGPT personalizes learners' diverse learning characteristics, styles, and uniqueness with the dissemination of dialogic commentaries. Guo et al. [4] adduce that it is becoming progressively vital for second language teachers to arm EFL learners with the precise internalization of ChatGPT at the commencement of their regular learning enterprises, through which their specific learning needs will be fully catered to with suitable digital feedback.

In college, university-level EFL learners must produce quality academic writing. They must balance their ideas with the right language. Mun [5] states that skilled academic writers can express ideas that fit the context of their readers. Haleem et al. [6] urge EFL teachers to continually help learners develop better language, vocabulary, and writing skills. This support allows students to write better academic pieces. ChatGPT can help learners overcome writing challenges. It supports students by giving immediate and helpful feedback. This allows learners to revise their writing and fix errors. Chen et al. [7] say ChatGPT helps learners improve writing quality with reliable and timely suggestions.

ChatGPT is a key tool for university EFL learners who want to improve their writing skills. Its interactive features help students learn new language and conventions. By using ChatGPT, learners get better at explaining their ideas to an international audience. Kasneci et al. [8] agree that teachers should encourage ChatGPT use to help students improve their writing.

In relation to the feedback impartation process, ChatGPT serves as a critical determinant factor propelling university EFL learners into more fluent, efficient, and accurate academic writers. This is not happening by chance since ChatGPT acclimates university EFL learners to enforce an in-depth reflection of their specific writing strengths and weaknesses. Teng [9] advocates that second language educators habituate university EFL learners to the relevant usage of digital-oriented writing inputs formed in ChatGPT, by which they begin gaining profound awareness of some specific academic writing areas requiring insistent improvements. These types of computer-based feedback also play another crucial role in cultivating robust writing confidence, motivation, resilience, and persistence within university EFL learners. This matter is ascribed to a smoother ideation process endured by university EFL learners. The presence of seamless idea transitions has constantly happened since university EFL learners are capable of tailoring the specifically addressed writing suggestions in their particular academic writing tasks. All these positive writing learning outcomes are substantiated by Gayed [10], who underscores the paramount role of ChatGPT in ever-changing academic writing learning enterprises where university EFL learners began to be more cognizant of specific writing inputs rewarding to be incorporated in their writing compositions. Similarly, Chun and Barley [11] support an incessant internalization of ChatGPT in nowadays academic writing learning dynamics, with which university EFL learners are skillful at transitioning their thoughts, ideas, and viewpoints in a fluent and accurate manner.

The meaningful utilization of ChatGPT in modern academic writing learning enterprises is not without its inevitable challenges. With the absence of practical, understandable, and applicable artificial intelligence tool guidelines, university EFL learners tend to showcase excessive reliance on this digital learning platform. Javier and Moorhouse [12] found that the predominant number of global university EFL learners were more likely to fully imitate the newly-acquired target language expressions and vocabulary shared by ChatGPT, leading to the demise of their innovative thinking. This may increase the plagiarism rates concerning the authenticity of their finalized academic writing products. Pavlik [13] suggest that target language educationalists design more suitable digital learning guidelines before equipping university EFL learners with the productive use of ChatGPT in order to prevent them from conducting an unacceptable academic violation action; plagiarism. Hence, second language

educational parties should work hand-in-hand in devising compatible artificial intelligence tool guidelines before embarking on their academic writing teaching-learning enterprises with the endorsement of ChatGPT. By doing so, this technologically-driven learning assistance will not hamper the prolific growth of critical thinking, creativity, and analytical skills residing among university EFL learners. Tseng and Lin [14] theorize that it is indispensable for educational institutions to immerse all second language educational parties, experts, educators, practitioners, and learners into a consecutive series of artificial intelligence tool trainings through which they will be more capable of maximizing the potential utilities of their human-like learning platform responsibly.

Despite extensive prior investigations dedicated to the meritorious writing learning rewards addressed ChatGPT in terms of the salient elevation of writing proficiency, fluency, and confidence [2,7,9], none of these previous studies have profoundly centered on how university EFL learners perceive the utilization of ChatGPT in their regular writing learning process. Former investigations predominantly revealed the pedagogical benefits, such as feedback immediacy, error correction, and anxiety reduction, relished by university EFL learners while incorporating an efficient use of ChatGPT in their daily academic writing enterprises [12,13]. This research gap revealed the necessary exploration on the importance of delving into university EFL learners' perspectives toward the potential use of ChatGPT in their daily-based academic writing learning trajectory. This regards the extent to which university EFL learners experience, interpret, and negotiate ChatGPT as one of the meaningfully supported artificial intelligence tools in their academic writing enterprises. All the above-elucidated lacuna urged the researchers to enforce this moderate library investigation in order to determine whether ChatGPT can be one of the proper accompanying artificial intelligence tools to shape their writing knowledge, skills, performances, motivation, confidence, and achievements to the utmost development. These essential writing aspects ought to reinforce other affective strands useful during the complex text composition process, comprising of university EFL learners' autonomy, creativity, and authenticity in the academic writing learning process. Anchoring on the aforementioned study aspirations, the researchers proposed a single inquiry to be exhaustively explored in the ensuing lines of this small-scale library study: What are university EFL learners' perceptions on the use of ChatGPT in their academic writing learning process?

METHODOLOGY

The researchers initiated this modest qualitative investigation with the help of a library analysis approach. A library analysis approach assisted the researchers in yielding more dependable, sound, and relevant findings, as a constant data monitoring procedure was conducted. According to Klassen et al. [15], a library analysis method is useful for helping researchers to construe their particularly analyzed data in corresponding ways since an iterative data evaluation is constantly enforced. To substantiate the data's robustness, forming a library analysis methodology, the researchers also employed a thematic analysis approach. With the endorsement of a thematic analysis approach, the researchers were more likely to generate more comprehensible, practical, and applicable findings as the targeted data had been clustered into relatable themes. Braun and Clarke [16] disclosed that a thematic analysis methodology was rewarding for helping the researchers to attain more accurate, relatable, and believable findings, by which the designated data would be divided into major related themes. To minimize huge data discrepancies among the thematically-oriented findings, the researcher implemented an open-coding approach. This will impact the accuracy and soundness of the findings, which are tightly interwoven with the major topical field investigated in this library study. Nowell et al. [17] uncovered that the 21st-century researchers were

capable of producing more precise and robust research results amidst the internalization of an open-coding approach, with which they were habituated to immediately rectify various kinds of incongruities derived from their data.

The researchers instilled two major intentions upon commencing this moderate library investigation. Firstly, the researchers believed that by obtaining a more comprehensive understanding of university EFL learners' perceptions on ChatGPT utilization in the academic writing learning process, the forthcoming findings could supportively assist second language educational experts, educationalists, and curriculum designers to devise more compatible academic writing learning programs best accommodating the optimal usage of this artificial intelligence tool. This may promote influential impacts for the continuity of the transformative academic writing learning process to be endured by university EFL learners since they are more likely to cast more positive views while partaking in a vast array of complex ideation processes. Lastly, the researchers were eager to arouse second language educators' readiness in ascertaining the maximum internalization of ChatGPT in their habitual academic writing learning enterprises. This sound preparedness is influenced by their comprehensive understanding of specific classroom conditions, through which ChatGPT can potentially promote more participatory, active, and productive academic writing learning climates to multifarious classroom community members.

For the study's selection process, the researchers paid more exhaustive attention to selecting 30 previously published ChatGPT scientific works in reputable international and national journal article platforms. Those so-called renowned academic websites include Elsevier, Taylor & Francis, Frontiers and Psychology, English Language Teaching, Research Gate, and numerous other journal article platforms. With an embodiment of the above-mentioned action, the researchers will have broader opportunities to address more robust, relevant, and applicable results contributing to the progressive advancement of sophisticated artificial intelligence learning platforms in nowadays academic writing enterprises. It can be stated that way as these prior findings were yielded based on research-informed, scientifically-proven outcomes stipulated by previous second language educational experts, educators, researchers, and practitioners. Speaking specifically, all these 30 particularly chosen studies ranged from 2023 to 2025. This three-year-old's published works are the topmost priority integrated while propelling this moderate library study, as all the results are still harmoniously aligned with the utilization of artificial intelligence tools in modern academic writing learning contexts.

With respect to the data explanations process, the researchers agreed on refraining from delineating their personal perspectives, interpretations, arguments, and opinions concerning the targeted findings. Therefore, the researchers attempted to capitalize on a descriptive data explication procedure while expounding the thematically-subsumed findings. By considering all these underlying conceptions, the researchers were more prone to impart more neutral, original, and authentic findings in reference to the main specific study area explored in this library investigation. The full attainment of these notable research outcomes did not happen incidentally since the researchers specifically reported the designated results based on the factual data descriptions determined by global second language educational experts. Apart from the objective stance attached to this small-scale library study, the researchers amplified the targeted research reports with the mutual endorsement of artificial intelligence theories and findings. By carrying out this ultimate research step, the researchers would have broader opportunities to address more plausible and widely accepted results due to the cultivation of a scientifically oriented nature accompanying each single data point.

FINDINGS AND DISCUSSIONS

The researchers came to the final agreement concerning the thematically-categorized findings forming in these subsequent sections: (1) ChatGPT allowed the enhancement of writing accuracy, proficiency, and strategic competence, and (2) ChatGPT cultivated motivation, confidence, and positive writing dispositions among global university EFL learners. The comprehensive depictions of these specifically determined research themes can be seen in the ensuing lines.

Theme 1: ChatGPT Allowed the Enhancement of Writing Accuracy, Proficiency, and Strategic Competence

Theme 1	Authors
ChatGPT allowed the enhancement of writing accuracy, proficiency, and strategic competence	Mun [5]; Teng [9]; Nguyen et al. [18]; Fujiono et al. [19]; Han et al. [20]; Zeevy Solovey [21]; Hossain and Al Younus [22]; Yulistyawan et al. [23]; Lee [24]; Woo et al. [25]; Nguyen Thi Thu [26]; Song and Song [3]; Bok and Cho [27]; Chia et al. [28]; Apriani et al. [29]; Bibi and Atta [30]; Xiao and Zhi [31].

Theme 1 unveiled that ChatGPT allowed the enhancement of writing accuracy, proficiency, and strategic competence. The improvement of writing accuracy is impacted by university EFL learners' ability to spot various kinds of shortcomings forming in their academic writing compositions. As alluded to in the prior section, ChatGPT empowered university EFL learners' cognitive writing development in the long run, by which they obtained a wide array of beneficial, rewarding, and relevant feedback. With the supportive accompaniment of these feedback types, university EFL learners can conduct better text revisions, resulting in the generation of qualified writing products. Mun [5] unfolded that the vast majority of Korean university EFL learners were capable of rectifying their particular writing shortfalls consisting of grammar and word choices, after being armed with the proper internalization of ChatGPT. In another study, Teng [9] unearthed that with the provision of constructive, trustworthy, and relevant feedback put forward by ChatGPT, the great number of Chinese university EFL learners could effortlessly identify their specific writing drawbacks. In conformance with academic writing proficiency and strategic competence development, ChatGPT paved a valuable trajectory for university EFL learners to gradually turn into more skillful target language writers. This laudable writing disposition is more likely to be deeply rooted given the fact that ChatGPT ceaselessly habituates university EFL learners to make flexible writing strategy adjustments during the text composition process. With this adaptable writing practice, university EFL learners no longer feel perturbed while being crammed with unpredictable writing hindrances due to the comprehensive possession of suitable writing approaches. Zeevy Solovey [21] prompted global second language educationalists to introduce university EFL learners to an accurate use of ChatGPT at the commencement of their academic writing learning enterprises, through which they start learning to orchestrate a wide variety of meaningful writing strategies in line with their writing assignments. Hossain and Al Younus [22] postulated that it is essential for worldwide target language educators to broaden university EFL learners' understanding of the compatible use of ChatGPT before commissioning them to accomplish various demanding writing tasks, with which they foster their problem-solving and decision-making skills.

With the realization of these holistic academic writing dynamics, university EFL learners are more prone to obtain more fruitful academic achievements. It can be stated that way since they are skilled at intertwining their designated ideas, conceptions, notions, and standpoints with the presence of accurate target language expressions. This rewarding writing

learning value is parallel with Yulistyawan et al. [23] recommending Indonesian university EFL educators to maximize the fullest utilization of ChatGPT in their academic writing learning process, in which language learners are skillful at conveying comprehensible information to the targeted readers' contexts. Woo et al. [25] accentuated the paramount role of ChatGPT at the onset of academic writing learning enterprises, wherein Hong Kong university EFL learners were accustomed to pondering more conscientiously on specific linguistic expressions best expressing their personal writing ideas. ChatGPT served as a crucial empowerment for the significant advancement of university EFL learners' writing knowledge, skills, and experiences. Owing to the dissemination of immediate, meaningful, and relatable feedback, university EFL learners unwittingly acquire a richer array of useful target language expressions, vocabulary knowledge, and academic writing conventions. As a result, they will have broader opportunities to showcase more exemplary writing performances. Nguyen Thi Thu [26] found that an overwhelming majority of Vietnamese university EFL learners attained more satisfying academic writing test results after being exposed to an accurate use of ChatGPT, through which they immensely widened their writing knowledge, competencies, and perspectives. Song and Song [3] revealed that a great number of Iranian university EFL learners obtained more gratifying academic writing achievements amid the application of ChatGPT, whereby they activated the harmonious interplay of five pivotal writing elements: organization, coherence, cohesion, grammar, and vocabulary.

With the constant enlightenment of ChatGPT, global university EFL learners are more prone to endure a smoother writing ideation process. This is credited to the richer availability of exemplary text composition models provided by ChatGPT. By taking a more profound look at these high-quality writing texts, university EFL learners progressively shift into more well-rounded academic writers since they productively apply those newly acquired writing conceptions in their academic writing products. Apriani et al. [29] acknowledged that ChatGPT could facilitate university EFL learners to engender high-quality academic writing texts due to the significant elevation of their writing knowledge, skills, and performances. Bibi and Atta [30] motivated Pakistani university EFL learners to conduct more exhaustive analysis while observing a vast variety of academic writing models addressed by ChatGPT, by which they were accustomed to organizing well-structured thoughts in their impending academic writing compositions.

Theme 2: ChatGPT Cultivated Motivation, Confidence, and Positive Writing Dispositions among Global University EFL Learners

Theme 2	Authors
ChatGPT cultivated motivation, confidence, and positive writing dispositions among global university EFL learners	Kivrak [32]; Lee [24]; Hayadi et al. [33]; Nguyen and Dieu [34]; Thao and Thuy [35]; Polakova and Ivenz [36]; Harunasari [37]; Salwa and Tyas [38]; Werdiningsih et al. [39]; Rahma and Fithriani [40]; Haerazi et al. [41]; Artiana and Fakhurriana [42]; Pinninti [43].

Theme 2 disclosed that ChatGPT could cultivate motivation, confidence, and positive writing dispositions among global university EFL learners. Regarding motivation, ChatGPT allowed a positive pathway for university EFL learners to enforce self-initiated academic writing practices outside the regular classroom walls. The entrenchment of this robust academic writing motivation is not happening by accident since university EFL learners have inculcated a higher degree of inquisitiveness towards novel writing knowledge, skills, and models addressed by ChatGPT. Lee [24] articulated that it is becoming progressively crucial for Vietnamese university EFL educationalists to immerse their learners in ChatGPT-based academic writing learning dynamics, in which they insistently invigorate their intellectual empowerment after acquiring a wider range of novel writing conceptions. In the light of

ChatGPT, university EFL learners do not easily feel discouraged while being impeded by a wide variety of taxing academic writing obstructions. Instead, they are committed to redoubling their efforts to successfully accomplish their academic writing tasks. As a result of this expanded action, university EFL learners will succeed at addressing more comprehensible writing ideas to wider readers' settings as they can organize their personal thoughts in corresponding ways. The above-elaborated finding accorded with Kivrak [32], pinpointing the critical importance of embedding the meaningful activation of ChatGPT in Turkish university EFL learners' regular academic writing enterprises to promote more exponential growth of their resilience, persistence, and confidence.

Another positive writing disposition university EFL learners can strongly entrench amid the meaningful incorporation of ChatGPT is that they are willing to dedicate more effortful actions in exploring the topical subjects proposed in their academic writing tasks. With a more well-developed understanding of specific writing topics, university EFL learners are more likely to relish their whole text composition process as they have been cognizant of the forthcoming writing steps to be further actualized. Thao and Thuy [35] propelled global second language university EFL lecturers to invest their daily academic writing learning enterprises with the supportive assistance of ChatGPT, with which second language learners take some self-initiated actions in exploring a vast array of related information concerning their particular writing topics. By nurturing all these transformative academic writing practices, university EFL learners began to develop robust writing learning autonomy. This laudable writing attribute is characterized by consistent writing evaluation records taking place among university EFL learners. Meaning to say, ChatGPT automated university EFL learners' initiative actions to plan, monitor, and evaluate their entire academic writing learning trajectory. Harunasari [37] confessed that Indonesian university EFL learners no longer depend excessively on their academic writing learning instructors' intensive writing assistance after being armed with ChatGPT, as it promoted more personalized writing learning dynamics contributing to the salient enhancement of their text quality. ChatGPT is also responsible for promoting a less-anxious and stress-free academic writing learning atmosphere to the whole university community. This probability may more likely occur since ChatGPT continually imparts university EFL learners with a consecutive series of multifarious writing instructional models catering to their divergent writing learning needs, preferences, and levels. This beneficial learning reward is in agreement with Werdiningsih et al. [39], instigating target language educators to ascertain the compatible activation of ChatGPT at the outset of their ever-changing academic writing dynamics in order to bring about a higher degree of writing learning enjoyment due to the comprehensive fulfillment of university EFL learners' diverse writing interests, skills, and conditions. As a result of this significantly enhanced academic writing learning enjoyment, university EFL learners are desirous of generating longer sentences in their prospective text composition process. This is influenced by the advanced mastery of sophisticated diction, vocabulary, and grammar knowledge, which are beneficial for their academic writing process. The above-mentioned learning reward is in consonance with Rahma and Fithriani [40], highlighting the crucial role of ChatGPT in nowadays academic writing activities, through which Indonesian university EFL learners start transforming into more insightful writers who are skilled at inserting a wide variety of advanced target language expressions, proper word choice, and correct grammatical structure in their writings.

CONCLUSIONS AND RECOMMENDATIONS

On the whole, it can be inferred that ChatGPT stands as a powerful solution for second language educators aspiring to promote meritorious academic writing learning outcomes and ensure the prolific growth of academic writing perspectives among university EFL learners. In harmony with the dissemination of rewarding academic writing achievements, ChatGPT allowed the enhancement of writing accuracy, proficiency, and strategic competence. As university EFL learners take a critical discernment of a wide variety of sound, constructive, meaningful, and contextualized academic writing feedback imparted by ChatGPT, they begin transforming into more seasoned target language writers. This is not an incidental event since university EFL learners create a solid connectivity between the specifically-acquired writing suggestions with their current academic writing contexts, enabling them to execute the designated tasks with the presence of appropriate writing strategies. In compliance with the burgeoning development of a positive mindset towards academic writing learning enterprises, ChatGPT fostered university EFL learners' motivation, confidence, and commendable writing dispositions. Instead of infusing an excessive degree of academic writing anxiety, university EFL learners remain curious towards every single new conception obtained in their topical subjects. This robust intellectual curiosity is a pivotal catalyst for university EFL learners to transform into more resilient, persistent, and optimistic academic writers, truly reflecting their exemplary writing performances. Given the potential of these advantageous academic writing learning benefits, second language educationalists ought to ascertain a revolutionary transformation toward their habitual academic writing teaching-learning dynamics by ensuring the profusion of fruitful writing learning outcomes with the sound support of suitable artificial intelligence tools.

All these thematically-oriented research outcomes are anticipated to promote beneficial implications for worldwide educational institutions, second language educators, university EFL learners, and curriculum designers. With regard to the practicality, feasibility, and applicability of ChatGPT in response to the relentless academic writing complexities, it is worth advocating for educational parties to start catering to their teachers' professionalism and ethical working spirit with the continual exposure of artificial intelligence tool trainings. By executing the above-suggested advice, second language educationalists will be more eager to internalize ChatGPT in their academic writing learning process due to the comprehensive understanding of its nature, utilities, and functions. Furthermore, second language educationalists are hoped to stay up-to-date toward the exponential advancement of artificial intelligence learning platforms, revolutionizing the whole academic writing learning process in this industrial revolution 4.0 era. This action is necessary to be taken in order for them to bring about a more convivial, flexible, and less restricted text composition process, by which university EFL learners can experiment with a vast range of ideas, attempts, and knowledge in the designated academic writing learning dynamics. It is equally important for university EFL learners to constantly develop their digital literacy skills before initiating their personalized academic writing enterprises with the optimal application of ChatGPT. With the robust endorsement of well-developed digital literacy competencies, university EFL learners will be more selective, cautious, and mindful before adopting a vast array of digital writing inputs, concepts, and information found in their artificial learning platform. As a corollary, they will not be overdependence on every idea, knowledge, and contention suggested by their artificial intelligence tool since they have been familiar with the most logical conceptions suitable to be further implemented for the successful accomplishment of their academic writing tasks. For curriculum designers, it will be rewarding for them to enforce constant adjustments concerning the applicability of ChatGPT in heterogeneous academic writing classroom environments. The above-articulated input can be carried out by conducting comprehensive mappings toward university EFL learners' specific academic writing learning needs, interests, levels, and situations. This self-initiated action matters most for solidifying supportive, proactive, and productive academic writing behaviors in the presence of heterogeneous classroom

community members, as they can withstand a vast array of formidable difficulties associated with their personalized academic writing learning experiences.

Conversely, there are certain inevitable limitations forming in this moderate library investigation. Due to the single lens perspective marking the initiation of this small-scale library study, it is crucial for future researchers to replicate the current model of this modest library study by delving more profoundly into university EFL educators' perceptions on the use of ChatGPT in the academic writing learning process. With an in-depth exploration of this research variable, more insightful research results can be generated, which contribute to the terrific advancement of artificial intelligence tools' application in nowadays academic writing learning enterprises. As a result, worldwide educational institutions are capable of devising more suitable AI-based academic writing programs as their long-term investment since they have obtained a more holistic understanding of specific artificial intelligence learning platforms beneficial for sustaining university EFL learners' writing knowledge, skills, performances, and achievements.

Moreover, it will be rewarding for future researchers to conduct more exhaustive investigations on the actual implementation of ChatGPT in these modern academic writing activities. This recommendation can be carried out through the dispersion of classroom-based investigations utilizing questionnaires, open-ended interview inquiries, classroom surveys, and observation methods. By doing so, worldwide second language experts, educationalists, practitioners, policy makers, and curriculum designers will obtain more comprehensive portrayals regarding the best academic writing classroom circumstances under which ChatGPT can be operated to reach its fullest utilization. To ascertain more robust generalizability concerning the thematically-subsumed research findings forming in this library study, it will be more desirable for the prospective researchers to increase the number of relevant scientific works to be further reviewed. With an expansive discernment of substantial literature works, second language educational parties will be supportively assisted while determining some careful procedures in rejuvenating their existing academic writing programs, harmonious with the meaningful activation of artificial intelligence tools. This coveted finding outcome can potentially happen as they have been conscientiously cognizant of specific factors supporting or hindering the maximum application of AI-based academic writing learning integration.

CONFLICT OF INTEREST STATEMENT

The authors declare that there is no conflict of interest in the conduct of this research.

REFERENCES

- [1] Liang Y, Wu C, Song T, Wu W, Xia Y, Liu Y, et al. TaskMatrix.AI: Completing tasks by connecting foundation models with millions of APIs. *Intelligent Computing* 2024;3:0063. <https://doi.org/10.34133/icomputing.0063>.
- [2] Kostka I, Toncelli R. Exploring applications of ChatGPT to English language teaching: Opportunities, challenges, and recommendations. *TESL-EJ* 2023;27. <https://doi.org/10.55593/ej.27107int>.
- [3] Song C, Song Y. Enhancing academic writing skills and motivation: Assessing the efficacy of ChatGPT in AI-assisted language learning for EFL students. *Frontiers in Psychology* 2023;14:1260843. <https://doi.org/10.3389/fpsyg.2023.1260843>.
- [4] Guo B, Zhang X, Wang Z, Jiang M, Nie J, Ding Y, et al. How close is ChatGPT to human experts? Comparison corpus, evaluation, and detection. *arXiv* 2023. <https://doi.org/10.48550/arXiv.2301.07597>.

- [5] Mun C. EFL learners' English writing feedback and their perception of using ChatGPT. *STEM Journal* 2024;25:26–39. <https://doi.org/10.16875/stem.2024.25.2.26>.
- [6] Haleem A, Javaid M, Singh RP. An era of ChatGPT as a significant futuristic support tool: A study on features, abilities, and challenges. *BenchCouncil Transactions on Benchmarks, Standards and Evaluations* 2022;2:100089. <https://doi.org/10.1016/j.tbench.2023.100089>.
- [7] Chen Q, Sun H, Liu H, Jiang Y, Ran T, Jin X, et al. An extensive benchmark study on biomedical text generation and mining with ChatGPT. *Bioinformatics* 2023;39:btad557. <https://doi.org/10.1093/bioinformatics/btad557>.
- [8] Kasneci E, Sessler K, Küchemann S, Bannert M, Dementieva D, Fischer F, et al. ChatGPT for good? On opportunities and challenges of large language models for education. *Learning and Individual Differences* 2023;103:102274. <https://doi.org/10.1016/j.lindif.2023.102274>.
- [9] Teng MF. Metacognitive awareness and EFL learners' perceptions and experiences in utilising ChatGPT for writing feedback. *European Journal of Education* 2025;60:e12811. <https://doi.org/10.1111/ejed.12811>.
- [10] Gayed JM. Educators' perspective on artificial intelligence: Equity, preparedness, and development. *Cogent Education* 2025;12:2447169. <https://doi.org/10.1080/2331186X.2024.2447169>.
- [11] Chun J, Barley N. A comparative analysis of multiple-choice questions: ChatGPT-generated items vs. human-developed items. In: *AI in applied linguistics*. Iowa State University Digital Press; 2024, p. 118–36. <https://doi.org/10.31274/isudp.2024.154.08>.
- [12] Javier DRC, Moorhouse BL. Developing secondary school English language learners' productive and critical use of ChatGPT. *TESOL Journal* 2024;15:e755. <https://doi.org/10.1002/tesj.755>.
- [13] Pavlik JV. Collaborating with ChatGPT: Considering the implications of generative artificial intelligence for journalism and media education. *Journalism & Mass Communication Educator* 2023;78:84–93. <https://doi.org/10.1177/10776958221149577>.
- [14] Tseng YC, Lin YH. Enhancing English as a foreign language (EFL) learners' writing with ChatGPT: A university-level course design. *Electronic Journal of e-Learning* 2024;22:78–97. <https://doi.org/10.34190/ejel.21.5.3329>.
- [15] Klassen AC, Creswell J, Plano Clark VL, Smith KC, Meissner HI. Best practices in mixed methods for quality of life research. *Quality of Life Research* 2012;21:377–80. <https://doi.org/10.1007/s11136-012-0122-x>.
- [16] Braun V, Clarke V. Can I use TA? Should I use TA? Should I not use TA? Comparing reflexive thematic analysis and other pattern-based qualitative analytic approaches. *Counselling and Psychotherapy Research* 2021;21:37–47. <https://doi.org/10.1002/capr.12360>.
- [17] Nowell LS, Norris JM, White DE, Moules NJ. Thematic analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods* 2017;16:1609406917733847. <https://doi.org/10.1177/1609406917733847>.
- [18] Nguyen HHB, Ngoc HHB, Dan TC. EFL students' perceptions and practices of using ChatGPT for developing English argumentative essay writing skills. *European Journal of Alternative Education Studies* 2024;9:168–216. <https://doi.org/10.46827/etae.v9i1.5341>.
- [19] Fujiono, Hartono R, Wahyuni S. Students' perceptions and experiences of ChatGPT-assisted writing in EFL contexts: A literature review. *IDEAS: Journal on English Language Teaching and Learning, Linguistics and Literature* 2025;13:1817–41. <https://doi.org/10.24256/ideas.v13i1.6943>.

- [20] Han J, Yoo H, Kim Y, Myung J, Kim M, Lim H, et al. RECIPE: How to integrate ChatGPT into EFL writing education. *Proceedings of the Tenth ACM Conference on Learning @ Scale*. Association for Computing Machinery; 2023. <https://doi.org/10.1145/3573051.3596200>.
- [21] Zeevy Solovey O. Comparing peer, ChatGPT, and teacher corrective feedback in EFL writing: Students' perceptions and preferences. *Technology in Language Teaching & Learning* 2024;6:1482. <https://doi.org/10.29140/titl.v6n3.1482>.
- [22] Hossain MK, Al Younus MA. Teachers' perspectives on integrating ChatGPT into EFL writing instruction. *TESOL Communications* 2025;4:41–60. <https://doi.org/10.58304/tc.20250103>.
- [23] Yulistyawan F, Halim A, Puspita RH. The use of ChatGPT in writing: English students' perception and satisfaction. *English Language Teaching Methodology* 2025;5:165–75. <https://doi.org/10.56983/eltm.v5i2.1868>.
- [24] Lee JH. ChatGPT-assisted writing: Learners' perceptions of AI feedback and influencing factors. *Korean Journal of English Language and Linguistics* 2025;25:493–515. <https://doi.org/10.15738/kjell.25..202504.493>.
- [25] Woo DJ, Wang D, Guo K, Susanto H. Teaching EFL students to write with ChatGPT: Students' motivation to learn, cognitive load, and satisfaction with the learning process. *Education and Information Technologies* 2024;29. <https://doi.org/10.1007/s10639-024-12819-4>.
- [26] Nguyen Thi Thu H. EFL teachers' perspectives toward the use of ChatGPT in writing classes: A case study at Van Lang University. *International Journal of Language Instruction* 2023;2:1–47. <https://doi.org/10.54855/ijli.23231>.
- [27] Bok E, Cho Y. Examining Korean EFL college students' experiences and perceptions of using ChatGPT as a writing revision tool. *STEM Journal* 2023;24:15–27. <https://doi.org/10.16875/stem.2023.24.4.15>.
- [28] Chia CSC, Phan J, Harry O, Lee KM. Graduate students' perception and use of ChatGPT as a learning tool to develop writing skills. *International Journal of TESOL Studies* 2024;6:113–27. <https://doi.org/10.58304/ijts.20240308>.
- [29] Apriani E, Daulay SH, Aprilia F, Marzuki AG, Warsah I, Supardan D. A mixed-method study on the effectiveness of using ChatGPT in academic writing and students' perceived experiences. *Journal of Language and Education* 2025;11:26–45.
- [30] Bibi Z, Atta A. The role of ChatGPT as AI English writing assistant: A study of student's perceptions, experiences, and satisfaction. *Annals of Human and Social Sciences* 2024;5:433–43. [https://doi.org/10.35484/ahss.2024\(5-1\)39](https://doi.org/10.35484/ahss.2024(5-1)39).
- [31] Xiao Y, Zhi Y. An exploratory study of EFL learners' use of ChatGPT for language learning tasks: Experience and perceptions. *Languages* 2023;8:212. <https://doi.org/10.3390/languages8030212>.
- [32] Kivrak C. Exploring EFL students' perceptions of using ChatGPT as a complementary tool in writing classes. *Language Education and Technology* 2024;4:170–80.
- [33] Hayadi AA, Sofyan D, Syafryadin S. EFL students' perceptions toward ChatGPT as a writing instrument. *ELTIN Journal: Journal of English Language Teaching in Indonesia* 2025;13:75–88.
- [34] Nguyen PH, Dieu NB. An investigation into third-year ELT students' perceptions of using ChatGPT as an AI writing-assistant tool: A case study in Vietnam. *International Journal of Arts Humanities and Social Sciences Studies* 2024;9:41–55.
- [35] Le Thanh Thao, Thuy PT. Exploring the impacts of ChatGPT in EFL writing: Student perceptions of opportunities and challenges in Vietnamese higher education. *Kognisi: Jurnal Ilmu Keguruan* 2023;1:107–24.

- [36] Polakova P, Ivenz P. The impact of ChatGPT feedback on the development of EFL students' writing skills. *Cogent Education* 2024;11:2410101. <https://doi.org/10.1080/2331186X.2024.2410101>.
- [37] Harunasari SY. Examining the effectiveness of AI-integrated approach in EFL writing: A case of ChatGPT. *International Journal of Progressive Sciences and Technologies* 2023;39:357–68. <https://doi.org/10.52155/ijpsat.v39.2.5516>.
- [38] Salwa A, Tyas NK. Exploring students' perception of EFL on the use of ChatGPT to complete the English writing task. *Berumpun: International Journal of Social, Politics, and Humanities* 2024;7:80–92. <https://doi.org/10.33019/berumpun.v7i1.186>.
- [39] Werdiningsih I, Marzuki, Indrawati I, Rusdin D, Ivone FM, Basthomi Y, et al. Revolutionizing EFL writing: Unveiling the strategic use of ChatGPT by Indonesian master's students. *Cogent Education* 2024;11:2399431. <https://doi.org/10.1080/2331186X.2024.2399431>.
- [40] Rahma A, Fithriani R. The potential impact of using ChatGPT on EFL students' writing: EFL teachers' perspective. *Indonesian EFL Journal* 2024;10:11–20. <https://doi.org/10.25134/ieflj.v10i1.9222>.
- [41] Haerazi H, Irawan LA, Sotlikova R. ChatGPT-based intelligent instructional model for enhancing EFL learners' writing skills: Perceptions and practices. *Ecolingua: Journal of Linguistics and Language Instruction* 2025;1:14–26.
- [42] Artiana N, Fakhurriana R. EFL undergraduate students' perspective on using AI-based ChatGPT in academic writing. *Language and Education Journal* 2024;9:1–11. <https://doi.org/10.52237/lej.v9i1.468>.
- [43] Pinninti LR. Undergraduate ESL students' use and perceptions of ChatGPT for academic writing purposes. *Texto Livre* 2025;18:e58320. <https://doi.org/10.1590/1983-3652.2025.58320>.