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Exploring the Role of ChatGPT in Developing Writing Skills and Critical Thinking among Vocational High School Students

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ABSTRACT

The rapid growth of generative artificial intelligence (AI), particularly ChatGPT, has introduced new possibilities for language learning through interactive feedback and writing assistance. Despite its increasing use in education, empirical evidence remains limited regarding its pedagogical role in vocational secondary schools, particularly in distinguishing its support for surface-level writing skills from deeper reasoning processes. This study investigated how ChatGPT integration could enhance students' writing skills, foster reasoning, and influence student perceptions in a vocational high school context. This research employed a qualitative Classroom Action Research (CAR) design conducted in two cycles with 32 eleventh-grade students at SMK YPE Sawunggalih Kutoarjo, Indonesia. Data were collected through classroom observations, writing tasks, semi-structured interviews, and student reflective journals. The data were analyzed thematically, while students' writing performance was evaluated using a rubric focusing on organization, grammar, vocabulary, and argumentation. The findings indicated consistent improvements in students' vocabulary, grammar, and organization across the two cycles, with vocabulary showing the most notable development. Students reported that ChatGPT was useful and motivating during the writing process. However, its contribution to argumentation and critical thinking remained relatively limited. Benefits included faster idea generation and greater engagement in revision activities, while challenges involved students' overreliance on AI-generated responses and limited skills in designing effective prompts. ChatGPT can function as an effective linguistic scaffold for supporting surface-level writing development. However, its impact on deeper reasoning and argumentation depends on structured teacher mediation and reflective instructional design. This study provides empirical evidence from a vocational secondary education context and highlights the conditions under which generative AI supports different dimensions of writing development.

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1. INTRODUCTION

The rapid emergence of generative artificial intelligence (AI), particularly ChatGPT, has transformed the landscape of language learning and teaching. In educational contexts, ChatGPT is increasingly used not only as a linguistic tool but also as a dialogic learning partner that supports learners in generating, revising, and improving texts (Kasneci et al., 2023; Tlili et al., 2023). Recent studies have highlighted that such tools can reduce writing anxiety and enhance students confidence by providing instant feedback and interactive guidance (Dizon, 2024; Levine et al., 2025). In vocational schools, where students typically prioritize technical expertise over linguistic competence, integrating AI-driven writing support emerges as a promising pedagogical innovation.

Writing in English as a foreign language (EFL) remains particularly challenging for vocational students. Many learners encounter persistent difficulties in idea generation, text organization, grammar, and vocabulary, which in turn hinder their overall communicative competence (Koltovskaia, 2020) While automated writing evaluation (AWE) tools like Grammarly have been shown to improve grammatical accuracy, their impact on higher-order thinking and reasoning remains limited(Ding & Zou, 2024). In contrast, ChatGPT's dialogic and adaptive feedback allows learners to test, refine, and restructure their arguments interactively, positioning it as more than a corrective instrument (Guo et al., 2022).

A clearer conceptual distinction between surface-level and deep-level writing skills is important for sharpening the theoretical foundation of this study. Surface-level writing skills include grammar accuracy, vocabulary use, and sentence-level correctness, whereas deep-level writing involves reasoning, evaluation, justification, and the ability to construct coherent arguments. Prior research has shown that AI-assisted tools such as ChatGPT and other automated writing evaluators are effective in supporting improvements in surface-level language features, particularly grammar and vocabulary (Ding & Zou, 2024). However, their role in fostering deep-level cognitive engagement, such as critical thinking, evidence evaluation, and argument development, remains less consistent and is still underexplored in secondary and vocational education contexts (Cao et al., 2022). Additionally, concerns have been raised about students' overreliance on AI outputs, which may reduce independent thinking and metacognitive engagement (Lingard, 2023; Zhai et al., 2024). This distinction is crucial, as it frames the expectation that while ChatGPT may address linguistic weaknesses, its capacity to stimulate reasoning and critical analysis may require stronger instructional scaffolding.

Another essential dimension concerns how students perceive AI assistance. Positive perceptions of AI tools have been linked to higher motivation, increased engagement, and improved self-efficacy in writing (Chan & Hu, 2023; Imran & Almusharraf, 2023). Conversely, skepticism or distrust may prevent students from fully benefiting from ChatGPT's affordances. Understanding vocational students' perceptions is crucial, as their acceptance and critical engagement with AI tools will determine the sustainability of such innovations in language classrooms.

However, most empirical studies on ChatGPT's role in enhancing writing skills have been conducted with university or adult learners, leaving secondary vocational students underrepresented. This creates a significant research gap, especially in Indonesia, where vocational education increasingly emphasizes not only technical mastery but also communicative competence in English. Students are expected to produce grammatically accurate writing while simultaneously demonstrating critical reasoning to analyze and respond to workplace-related problems. Thus, investigating ChatGPT's potential in vocational schools is both timely and necessary.

Pedagogical design plays a decisive role in shaping how students use ChatGPT. Without structured guidance, learners may accept AI feedback uncritically, thereby hindering the cultivation of independent reasoning skills (Rudolph et al., 2023). Scholars argue that scaffolding strategies such as explicit prompt training, teacher moderation, and reflective tasks are indispensable in ensuring that students engage critically with AI outputs rather than reproducing them passively (Nowell et al.,

2017; Olsen & Hunnes, 2024). In vocational schools, this scaffolding is particularly relevant to bridge the gap between students' technical strengths and their linguistic and cognitive development.

To address these gaps, this study adopts a qualitative Classroom Action Research (CAR) design consisting of two cycles of planning, action, observation, and reflection(Schoonenboom & Johnson, 2017). CAR is suitable for systematically addressing classroom problems while simultaneously improving teaching practice. Through iterative cycles, it is possible to observe how ChatGPT can be integrated into writing instruction, refine strategies across cycles, and generate evidence-based insights into its impact on students' writing skills and critical thinking.

Accordingly, the present research seeks to investigate 1) how the integration of ChatGPT through CAR cycles can enhance vocational students English writing, 2) in what ways the chatbot contributes to fostering critical thinking during writing tasks, and 3) what challenges and opportunities arise when ChatGPT is embedded into classroom instruction at SMK. These three guiding questions highlight the novelty of this study: it focuses on vocational high school students in Indonesia a population often absent from AI in education research and positions ChatGPT not only as a writing assistant but also as a cognitive partner that stimulates reflection, reasoning, and iterative improvement.

However, existing studies largely emphasize surface-level writing outcomes or experimental settings involving university students, resulting in limited empirical evidence on how ChatGPT supports both writing development and critical thinking processes in vocational secondary education through authentic classroom implementation.

Unlike prior studies focusing on controlled experiments or higher education contexts, this study employs Classroom Action Research in a vocational high school setting, highlighting pedagogical processes and teacher mediation rather than isolated learning outcomes.

2. METHODS

This study employed a qualitative Classroom Action Research (CAR) design consisting of two cycles, following the spiral model of planning, action, observation, and reflection developed by Kemmis and McTaggart (Nowell et al., 2017; Schoonenboom & Johnson, 2017). The choice of CAR was grounded in its suitability for systematically addressing classroom problems while simultaneously improving instructional practices. In this context, CAR was used to examine how ChatGPT could be integrated into English writing instruction in vocational education, focusing on (a) students' perceptions of ChatGPT as a writing support tool, (b) the extent to which ChatGPT fostered critical thinking during writing tasks, and (c) the challenges and opportunities encountered in its classroom use. Each cycle allowed the researcher and classroom teacher to collaboratively implement, observe, and refine strategies, ensuring that the intervention remained responsive to students' needs.

The classroom instruction was conducted by the regular English teacher, who acted as the practitioner responsible for lesson implementation and classroom management. The researcher assumed the role of observer and facilitator, focusing on documenting classroom interactions and collecting research data. To manage potential researcher bias, role separation was maintained throughout the cycles, supported by peer debriefing and reflective discussions between the researcher and the teacher after each cycle.

The participants in this research were 32 eleventh-grade students enrolled in the Computer and Network Engineering program at SMK YPE Sawunggalih Kutoarjo, Indonesia. They were selected purposively, as vocational students are increasingly required to balance technical knowledge with communicative competence, particularly in writing. Prior studies suggest that while these students are familiar with technology, their English writing and reasoning abilities remain underdeveloped (Imran & Almusharraf, 2023; Polakova & Ivenz, 2024). The classroom teacher collaborated closely with the researcher throughout the cycles, which enhanced both the ecological validity and the practicality of the study (Kasneci et al., 2023).

The research was conducted in two cycles, each lasting three weeks. The first cycle emphasized using ChatGPT as a writing assistant to support brainstorming, idea generation, and revision of grammar and vocabulary. Lesson plans were designed to introduce ChatGPT-based tasks, and students were guided in using prompts to draft and revise essays. During implementation, the researcher observed students' interactions with ChatGPT, while the teacher provided scaffolding to ensure the tool was used constructively. Reflection at the end of the cycle revealed areas where students benefited particularly in organization and vocabulary but also highlighted challenges such as overreliance on AI-generated text. Consequently, the second cycle was designed to position ChatGPT more explicitly as a cognitive partner, encouraging students to use the tool for argument construction, evidence evaluation, and developing reasoning skills (Su et al., 2023).

Data collection in this study was continuous across the two cycles and aligned with the three research questions. Classroom observations were conducted to capture how students engaged with ChatGPT during writing activities and to record interaction patterns, motivation, and problem-solving behaviors (Huisman et al., 2019). Writing assignments were collected at three points before Cycle 1, after Cycle 1, and after Cycle 2 to allow comparative analysis of progress in organization, grammar, vocabulary, and argumentation (Guo et al., 2022; Li et al., 2024). In addition, semi-structured interviews were carried out with selected students at the end of each cycle to explore their perceptions of ChatGPT's usefulness, challenges encountered, and its impact on their critical thinking (Nowell et al., 2017). Students also wrote reflective journals documenting their weekly experiences with ChatGPT, providing insights into their evolving engagement and metacognitive reflection (Lingard, 2023).

The data analysis combined thematic analysis and rubric-based performance evaluation. Observation notes, interview transcripts, and reflective journals were analyzed thematically, following (Nowell et al., 2017) six-step approach to ensure credibility and trustworthiness. Codes were developed in relation to the three research questions: (a) perceptions of ChatGPT in supporting writing, (b) the extent to which ChatGPT fostered critical thinking, and (c) the challenges and opportunities of its classroom integration. Students' essays were evaluated qualitatively using a rubric adapted from previous studies on AI-assisted writing (Guo et al., 2022; Su et al., 2023), allowing the researcher to trace improvements in both language features and reasoning across cycles. The rubric was conceptually adapted to align with the instructional objectives of the CAR cycles and was used to trace developmental trends across cycles rather than for inferential statistical comparison. As this study employed a qualitative Classroom Action Research design, Likert-scale scores from 32 students were used descriptively to illustrate patterns of change across cycles and do not imply statistical testing or causal inference.

To enhance the trustworthiness of the findings, multiple strategies were applied. Triangulation was achieved by drawing on multiple data sources student essays, classroom observations, interviews, and journals to reinforce validity through convergence (Creswell & Creswell, 2018). Member checking was conducted during interviews to ensure that students meanings were accurately represented, and peer debriefing with the classroom teacher further supported the dependability of the interpretations. Ethical considerations were maintained by securing informed consent and ensuring anonymity in all reporting. Through these procedures, the study maintained methodological rigor while generating insights into how ChatGPT could be harnessed as both a writing assistant and a cognitive partner in vocational education (Rudolph et al., 2023).

3. FINDINGS AND DISCUSSION

The study aims to explore how ChatGPT integration could enhance writing skills, foster reasoning, and shape student perceptions in a vocational high school context. The results of the study were obtained from three data sources: Observation, Questionnaire, and Interview.

3.1 Students' Writing Performance

Student writing assessment is carried out in three stages: pre-cycle, post-cycle 1, and post-cycle 2. The aspects assessed included organization, grammar, vocabulary, and argumentation using a Likert scale of 1-4.

Table 1. Average Writing Performance Score (n = 32)

Aspect	Pre-Cycle	Post-Cycle 1	Post-Cycle 2
Organization	2.1	2.7	3.3
Grammar	2.0	2.6	3.1
Vocabulary	2.2	2.8	3.4
Argumentation	1.9	2.4	3.0
Overall	**2.05**	**2.63**	**3.20**

Table 1 shows the average writing performance scores of 32 students across the three stages. The overall mean score increased from 2.05 in the pre-cycle to 2.63 in post-cycle 1 and further to 3.20 in post-cycle 2, showing a pattern of consistent improvement in students' writing performance over time.

Across individual aspects, organization improved from 2.1 in the pre-cycle to 3.3 in post-cycle 2, while vocabulary increased from 2.2 to 3.4, representing the highest gains among the assessed aspects. Grammar scores also showed steady improvement, rising from 2.0 to 3.1. Argumentation improved from 1.9 in the pre-cycle to 3.0 in post-cycle 2; however, the rate of improvement in this aspect was relatively slower compared to organization and vocabulary.

These findings are supported by students' interview responses, which describe their experiences in improving organization, vocabulary, and grammar, as well as their difficulties in developing arguments. "Before using ChatGPT, I often didn't know how to organize my ideas. After seeing the examples and suggestions, I could arrange my paragraphs more clearly and use better vocabulary." (Student 1). "When I checked my writing with ChatGPT, I realized many grammar mistakes that I usually didn't notice, so I could revise my sentences." (Student 2). "ChatGPT gave ideas for arguments, but I still found it difficult to explain my own reasons." (Student 4).

These patterns are visually represented in Figure 1, which illustrates a gradual and consistent increase in all writing aspects from the pre-cycle to post-cycle 2.

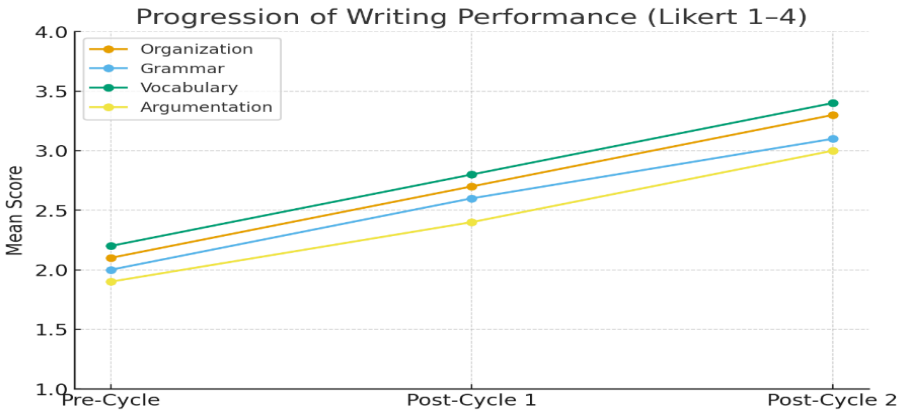

Figure 1. Progression of Writing Performance

3.2 Students' Perceptions of ChatGPT

The perception questionnaire using the Likert scale of 1-4 (1 = strongly disagree, 4 = strongly agree) included three dimensions: usefulness, motivation, and critical thinking aid.

Table 2. Students' Perception of ChatGPT (n = 32)

Dimension	Mean Score
Usefulness for writing	3.4
Motivation & confidence	3.2
Critical thinking aid	2.9
Overall perception	**3.2**

As presented in Table 2, students rated ChatGPT highest in terms of usefulness for writing, with a mean score of 3.4. The motivation and confidence dimension received a mean score of 3.2, indicating generally positive perceptions related to students' engagement and confidence during writing activities. The critical thinking aid dimension obtained the lowest mean score, at 2.9.

Students' interview responses further explain how they perceived the usefulness of ChatGPT, its motivational effects, and its limited support for critical thinking. "ChatGPT is very useful for me because it helps me start writing faster when I don't have ideas." (Student 3). "I feel more confident when writing because I can ask ChatGPT first before submitting my work." (Student 5). "ChatGPT helps with language, but it doesn't really make me think deeply unless the teacher asks us to revise again." (4).

Figure 2 further illustrates these results, showing that usefulness received the highest rating, followed by motivation and confidence, while critical thinking aid was rated comparatively lower.

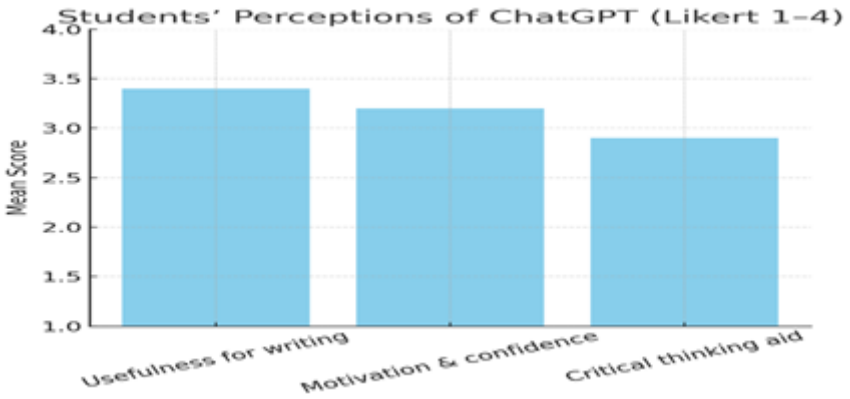

Figure 2. Students Perception of ChatGPT

3.3 Challenges and Opportunities Observed

The findings from classroom observations, interviews, and students' reflective journals revealed that the integration of ChatGPT in writing activities opened up both opportunities and challenges. On the opportunity side, students were able to generate ideas and expand their vocabulary much more quickly than in traditional writing tasks. The instant suggestions provided by ChatGPT encouraged them to move beyond hesitation and experiment with new expressions. Many students also became more actively involved in the process of revision. Rather than submitting their first draft, they were motivated to refine and restructure their texts with the support of AI-generated feedback. This iterative engagement fostered a sense of ownership and gradually built their confidence, which in turn encouraged them to produce longer and more elaborate pieces of writing than they had previously attempted.

At the same time, several challenges emerged. A number of students showed a tendency to copy and paste the content generated by ChatGPT without engaging in deeper analysis or adaptation. This behaviour limited the development of their critical thinking and reduced the originality of their work.

Another difficulty lay in the students' limited ability to construct effective prompts. Since the quality of ChatGPT's responses often depends on the precision of the input, weaker prompts resulted in less useful suggestions, leaving some students frustrated or overly reliant on generic outputs. These challenges highlighted the crucial role of the teacher as a scaffold. Without guided instruction and reflective questioning, students risked using ChatGPT passively rather than as a tool for active learning. Therefore, teacher mediation was essential to help students critically evaluate the AI's responses, select what was relevant, and transform the output into meaningful academic writing.

Discussion

The findings of this study demonstrate that ChatGPT contributed substantially to improving students' surface-level writing skills, particularly grammar, vocabulary, and organization, while exerting a more limited influence on deep-level reasoning and argumentation. This pattern aligns with previous research indicating that AI-based writing tools are generally effective in supporting linguistic accuracy and textual organization but show less consistent impact on higher-order cognitive processes such as reasoning and argument development (Ding & Zou, 2024; Li et al., 2024). In this study, students benefited from ChatGPT's contextualized vocabulary input, interactive sentence reformulation, and exposure to sample text structures, which supported the internalization of lexical choices and organizational patterns.

However, the slower progression in students' argumentative writing highlights a clear boundary in ChatGPT's pedagogical function. Although the tool was able to generate ideas and examples, many students incorporated these outputs passively without critically evaluating their relevance, coherence, or argumentative strength. This finding mirrors concerns raised in previous studies, which suggest that learners may rely uncritically on AI-generated text when adequate evaluative guidance is absent (Lingard, 2023; Zhai et al., 2024). Deep-level writing skills—such as justification, evaluation of evidence, and rhetorical reasoning—require deliberate cognitive engagement and cannot be fully supported through automated text generation alone.

In this context, ChatGPT functioned primarily as a linguistic scaffold rather than an independent driver of critical thinking. The findings indicate that effective development of reasoning skills depends heavily on teacher mediation. In this study, when reflective questioning strategies and prompt refinement activities were introduced during Cycle 2, students began to engage more actively with AI-generated content, resulting in a modest improvement in argumentation performance. This suggests that AI tools can contribute to higher-order writing development only when embedded within structured pedagogical guidance.

Students' positive perceptions of ChatGPT further illuminate how AI integration shaped their learning experience. High ratings for usefulness and motivation indicate that ChatGPT helped reduce writing anxiety, increased learners' confidence, and provided a non-judgmental space for experimentation. These findings are consistent with earlier studies reporting that AI-assisted tools can enhance learner engagement and self-efficacy in writing tasks (Chan & Hu, 2023; Imran & Almusharraf, 2023). Nevertheless, the comparatively lower perception scores related to critical thinking support confirm that students did not naturally position ChatGPT as a cognitive partner without explicit instructional direction.

Based on these findings, to improve critical thinking, vocational high school English teachers can implement three key actions immediately: (1) encourage students to create a framework for writing texts. This framework allows students to understand the ideas that will be elaborated in writing coherently and clearly, rather than simply copying and pasting sentences. (2) Prioritize prompt literacy by teaching students to create prompts that require reasoning (e.g., "Generate two conflicting arguments and explain which one is weaker") rather than generic prompts. (3) Use reflective questions after students use ChatGPT: "What does ChatGPT suggest that you didn't think of? How can you adapt it to make it your own?" These actions will help students use ChatGPT actively rather than passively.

4. CONCLUSION

This study has several limitations that should be acknowledged. First, the small sample size of 32 students limits the extent to which the findings can be generalized to wider vocational school populations. Second, the six-week duration of the intervention provides only a short-term view of learners' development, making it difficult to determine whether the gains achieved through ChatGPT are sustainable in the long run. Third, the close collaboration between the researcher and the classroom teacher may have influenced classroom dynamics, introducing potential researcher–teacher interaction bias. In addition, students' varying levels of digital literacy affected the quality of prompts they produced, which in turn shaped the effectiveness of the AI support they received. Finally, the absence of a control group prevented the study from isolating the effects of ChatGPT from other instructional variables. Future research is therefore encouraged to employ longer intervention periods, experimental or quasi-experimental designs, and larger participant groups to strengthen the evidence base for AI-assisted writing instruction. At the same time, challenges such as students' tendency to copy AI outputs uncritically, their limited prompt-design skills, and the risk of over-reliance underscore the need for structured pedagogical guidance. These findings suggest that the successful integration of ChatGPT in writing instruction depends not merely on access to technology, but on deliberate instructional design that promotes reflection, evaluation, and learner autonomy. By positioning ChatGPT as both a writing aid and a guided cognitive partner, educators can help vocational students not only strengthen their linguistic competence but also gradually develop critical digital literacy and independent writing skills. ChatGPT does not replace critical thinking; rather, it amplifies it when embedded within reflective pedagogy and deliberate teacher mediation.

REFERENCES

Cao, S., Zhou, S., Luo, Y., & Wang, T. (2022). *A review of the ESL / EFL learners gains from online peer feedback on English writing*. *October*, 1-13. https://doi.org/10.3389/fpsyg.2022.1035803

Chan, C. K. Y., & Hu, W. (2023). Students' voices on generative AI: perceptions, benefits, and challenges in higher education. *International Journal of Educational Technology in Higher Education*, *20*(1), 43. https://doi.org/10.1186/s41239-023-00411-8

Creswell, J. W., & Creswell, J. D. (2018). *Research Design: Qualitative, quantitative, and mixed methods approach*. SAGE Publications, Inc.

Ding, L., & Zou, D. (2024). Automated writing evaluation systems: A systematic review of Grammarly, Pigai, and Criterion with a perspective on future directions in the age of generative artificial intelligence. *Education and Information Technologies*, *29*(11), 141-511-4203. https://doi.org/10.1007/s10639-023-12402-3

Dizon, G. (2024). *A systematic review of Grammarly in L2 English writing contexts*. https://doi.org/https://doi.org/10.1080/2331186X.2024.2397882

Guo, K., Wang, J., & Chu, S. K. W. (2022). Using chatbots to scaffold EFL students' argumentative writing. *Assessing Writing*, *54*, 100-666. https://doi.org/10.1016/j.asw.2022.100666

Huisman, B., Saab, N., van den Broek, P., & van Driel, J. (2019). The impact of formative peer feedback on higher education students' academic writing: a Meta-Analysis. *Assessment & Evaluation in Higher Education*, *44*(6), 863-880. https://doi.org/10.1080/02602938.2018.1545896

Imran, M., & Almusharraf, N. (2023). Analyzing the role of ChatGPT as a writing assistant at higher education level: A systematic review of the literature. *Contemporary Educational Technology*, *15*(4), ep464.

https://doi.org/10.30935/cedtech/13605

Kasneci, E., Sessler, 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*, 1-13. https://doi.org/10.1016/j.lindif.2023.102274

Koltovskaia, S. (2020). Student engagement with automated written corrective feedback (AWCF) provided by Grammarly: A multiple case study. *Assessing Writing*, *44*, 100-450. https://doi.org/10.1016/j.asw.2020.100450

Levine, S., Beck, S. W., Mah, C., Phalen, L., & PIttman, J. (2025). How do students use ChatGPT as a writing support? *Journal of Adolescent and Adult Literacy*, *68*(5), 445-457. https://doi.org/10.1002/jaal.1373

Li, J., Huang, J., Wu, W., & Whipple, P. B. (2024). Evaluating the role of ChatGPT in enhancing EFL writing assessments in classroom settings: A preliminary investigation. *Humanities and Social Sciences Communications*, *11*(1), 12-68. https://doi.org/10.1057/s41599-024-03755-2

Lingard, L. (2023). Writing with ChatGPT: An Illustration of its Capacity, Limitations & Implications for Academic Writers. *Perspectives on Medical Education*, *12*(1), 261-270. https://doi.org/10.5334/pme.1072

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic Analysis. *International Journal of Qualitative Methods*, *16*(1). https://doi.org/10.1177/1609406917733847

Olsen, T., & Hunnes, J. (2024). Improving students' learning—the role of formative feedback: experiences from a crash course for business students in academic writing. *Assessment & Evaluation in Higher Education*, *49*(2), 129-141. https://doi.org/10.1080/02602938.2023.2187744

Polakova, P., & Ivenz, P. (2024). The impact of ChatGPT feedback on the development of EFL students' writing skills. *Cogent Education*, *11*(1). https://doi.org/10.1080/2331186X.2024.2410101

Rudolph, J., Tan, S., & Tan, S. (2023). ChatGPT: Bullshit spewer or the end of traditional assessments in higher education? *Journal of Applied Learning & Teaching*, *6*(1). https://doi.org/10.37074/jalt.2023.6.1.9

Schoonenboom, J., & Johnson, R. B. (2017). How to Construct a Mixed Methods Research Design. *KZfSS Kölner Zeitschrift Für Soziologie Und Sozialpsychologie*, *69*(S2), 107-131. https://doi.org/10.1007/s11577-017-0454-1

Su, Y., Lin, Y., & Lai, C. (2023). Collaborating with ChatGPT in argumentative writing classrooms. *Assessing Writing*, *57*, 100-752. https://doi.org/10.1016/j.asw.2023.100752

Tlili, A., Shehata, B., Adarkwah, M. A., Bozkurt, A., Hickey, D. T., Huang, R., & Agyemang, B. (2023). What if the devil is my guardian angel: ChatGPT as a case study of using chatbots in education. *Smart Learning Environments*, *10*(1). https://doi.org/10.1186/s40561-023-00237-x

Zhai, C., Wibowo, S., & Li, L. D. (2024). The effects of over-reliance on AI dialogue systems on students' cognitive abilities: a systematic review. *Smart Learning Environments*, *11*(1), 28. https://doi.org/10.1186/s40561-024-00316-7