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Research Article

AI-assisted feedback in CLIL courses as a self-regulated language learning mechanism: students' perceptions and experiences

Retroalimentación asistida por IA en cursos CLIL como mecanismo de aprendizaje autorregulado de idiomas: percepciones y experiencias de estudiantes

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Abstract:
Introduction: The integration of AI in educational settings offers significant potential for enhancing learning experiences, particularly in Content and Language Integrated Learning (CLIL) contexts. AI tools, such as ChatGPT, provide personalized feedback on writing, addressing issues like unclear content, grammatical errors, or poor vocabulary. This study examines students' perceptions of AI-assisted feedback in a business CLIL course and evaluates the actual improvements in their writing based on the feedback provided by AI. **Methodology**: University students (n=205) participated in a 15-week Data Description writing course, using ChatGPT to receive specific criteria-based feedback on weekly compositions. Students revised their drafts based on this feedback before their submission. A survey (n=192) assessed their experiences and the perceived impact on writing skills and task efficiency. Additionally, a sample (n=336) of the writing compositions was coded and analyzed to evaluate linguistic enhancement. **Results:** Results indicate that students found AI feedback beneficial for improving writing skills and appreciated its immediacy and specificity. However,

concerns were noted about the complexity and relevance of the feedback. **Discussions:** Despite these issues, students responded positively, showing significant improvement in content accuracy and linguistic proficiency. **Conclusions**: The study highlights the potential of AI tools and the need for refining AI feedback mechanisms.

Keywords: self-regulated learning; AI-assisted learning; ChatGPT; CLIL; writing feedback; instructional feedback; ESL; ICTs.

Resumen:
Introducción: La integración de la inteligencia artificial (IA) en educación ofrece un potencial para mejorar el aprendizaje, particularmente en contextos de Aprendizaje Integrado de Contenidos y Lenguas Extranjeras (CLIL). Las herramientas de IA, como ChatGPT, proporcionan retroalimentación personalizada en el área de escritura, abordando problemas de contenido y del idioma. Este estudio examina las percepciones de los estudiantes sobre esta retroalimentación y evalúa las mejoras lingüísticas en su escritura. **Metodología**: Estudiantes universitarios (n=205) participaron en un curso de escritura de 15 semanas sobre Descripción de Datos, utilizando ChatGPT como medio de retroalimentación usando criterios específicos y se realizó una encuesta (n=192) para evaluar esta experiencia. Además, se analizó una muestra (n=336) de las composiciones escritas para evaluar el progreso en términos lingüísticos. **Resultados:** Los resultados indican que los estudiantes encontraron útil la retroalimentación para mejorar sus habilidades de escritura y apreciaron su inmediatez; sin embargo, también comentaron sobre la complejidad y relevancia de la retroalimentación. **Discusión**: A pesar de estos problemas, los estudiantes respondieron positivamente, mostrando una mejora significativa en la precisión del contenido y la competencia lingüística. **Conclusiones**: El estudio destaca el potencial de las herramientas de IA y la necesidad de refinar los mecanismos de retroalimentación de IA.

Palabras clave: aprendizaje autorregulado; aprendizaje asistido por IA; ChatGPT; CLIL; retroalimentación de escritura; retroalimentación instructiva; inglés como segunda lengua; TIC.

1. Introduction

The integration of Artificial Intelligence (AI) in educational settings represents a significant advancement towards enhancing students' learning experience, particularly in the area of language education. As AI tools offer personalized feedback, it addresses both linguistic and content-related issues in student writing. This is especially pertinent in Content and Language Integrated Learning (CLIL) environments, where students must navigate the dual challenges of mastering subject-specific knowledge and a foreign language simultaneously. The potential of AI to provide immediate, tailored feedback is invaluable in such contexts, promoting more efficient and effective learning processes.

Content and Language Integrated Learning (CLIL) is a pedagogical approach that combines subject matter instruction with language learning. This method has been widely adopted in various educational settings to promote bilingualism and enhance students' cognitive and communicative competencies. However, the dual focus of CLIL poses unique challenges, as students must grasp complex content while developing language proficiency. Balancing these

dual objectives is particularly demanding, as it requires careful planning and execution to ensure that neither content learning nor language development is compromised. This challenge is often categorized into two types of CLIL: "hard" and "soft." Hard CLIL involves a stronger focus on the subject matter with language learning occurring incidentally, whereas soft CLIL emphasizes language learning with content used as a vehicle to achieve linguistic goals (Coyle et al., 2010). Traditional feedback mechanisms often fall short in addressing the multifaceted needs of CLIL students, necessitating innovative solutions that can provide comprehensive support (Shintani & Ellis, 2013).

Artificial Intelligence, particularly AI-driven writing assistants like ChatGPT, has shown promise in addressing these needs. These tools can analyze student writing, offering detailed feedback on various aspects such as clarity, coherence, grammar, and vocabulary. According to recent studies, AI-assisted feedback significantly enhances students' writing skills by providing personalized, actionable insights that traditional feedback methods may not offer (Ranalli et al., 2017; Alzahrani & Alotaibi, 2024). This immediacy of AI feedback allows students to identify and rectify errors in real-time, fostering a self-regulatory learning environment.

In higher education, the application of AI in CLIL courses presents distinct advantages. AI tools not only support language development by addressing grammatical and lexical issues but also facilitate deeper engagement with subject content. By providing targeted feedback, AI can help students produce more accurate and coherent subject-related texts, thereby enhancing their overall academic performance. Furthermore, AI's ability to track long-term progress enables educators to tailor instructional strategies to individual learning needs, ensuring a more personalized and effective educational experience (Zawacki-Richter et al., 2019).

1.1. AI-Assisted Learning Tools

As AI-assisted learning technologies can offer fast and tailored feedback, their application in language teaching has become increasingly popular. A varied range of linguistic aspects, such as grammatical mistakes, correct punctuation, proper register and vocabulary, as well as small nuances in the language and unclear content are frequent writing concerns that have been greatly helped by these technologies, one of which is ChatGPT.

Currently, the applications of AI technology in language learning are numerous. Among the most well-known are intelligent tutoring systems (ITSs), automatic writing evaluation (AWE), and natural language processing (NLP) tools; all of which offer multiple and flexible features that can be used in a learning context. Son et al. (2023) assert that through repeated practice and correction, these tools assess learners' writing and give precise feedback, enabling them to develop and improve their writing abilities. This feedback has been proven to help students identify and correct their errors more efficiently compared to traditional feedback methods (Cao & Zhong, 2023; Dai et al., 2023). Additionally, Loyola and Helan (2024) add that AI tools can adapt to the proficiency level of learners, providing more relevant and challenging tasks as students progress in their learning.

Moreover, the integration of AI in language learning has been found to improve various language skills beyond writing. Based on Wei's study (2023), it is evident that AI-powered applications enhance reading comprehension, speaking performance, and overall language engagement by fostering L2 motivation and promoting self-regulated learning. These tools not only provide corrective feedback but also suggest alternative phrases and structures, thereby enriching the learning experience and boosting student confidence (Huang et al., 2022).

Additionally, Wei's (2023) research highlights that AI in language instruction positively impacts English learning achievement, further supporting the multifaceted benefits of AI tools in enhancing linguistic and motivational aspects of language learning. As Wei states, "These results highlight the potential of AI-based language learning platforms … to positively impact language learning outcomes, motivation, and foster self-regulated learning strategies among EFL learners" (2023, p. 8).

1.2. What are some of the challenges?

Several concerns such as the reliability and ethical use of AI-generated content have also been raised. Plagiarism and the potential for AI tools to undermine authentic learning experiences are also prevalent. For instance, the study by Wei (2023) points out that while AI can significantly boost learning outcomes and motivation, there is a pressing need to ensure that these tools are used ethically and that students are taught to critically assess AI-generated content. This aligns with findings from Huang et al. (2022), who emphasize the importance of refining AI feedback mechanisms to ensure they are clear, relevant, and supportive of genuine learning processes. Therefore, continuous refinement of AI feedback mechanisms is crucial to enhance their clarity and applicability, ensuring they effectively support student learning while mitigating potential drawbacks (Karataş et al., 2023; Wei, 2023).

Another challenge is the inherent bias present in AI algorithms, which can reflect and perpetuate existing prejudices found in the data they were trained on. Bias in AI feedback can lead to unequal learning experiences and potentially disadvantage certain groups of students. Educators must be vigilant about these biases and work towards developing more equitable AI systems. Research by Binns et al. (2018) underscores the need for transparency in AI algorithms and the importance of ongoing assessment to identify and mitigate bias. Ensuring that AI tools are fair and unbiased is critical to maintaining trust and equity in educational contexts.

Moreover, a dependency on AI tools might reduce students' critical thinking and problem-solving skills. Over-reliance on AI-generated feedback can lead to a passive learning attitude where students might accept suggestions without questioning their validity or understanding the underlying principles. This challenge calls for a balanced approach where AI tools are used as supplementary aids rather than primary sources of learning. As Dai et al. (2023, p. 5) state, "it is crucial to maintain a balance between AI assistance and traditional teaching methods to prevent students from developing a passive learning attitude where they might accept AI-generated suggestions without questioning their validity or understanding the underlying principles". Educators should encourage students to engage critically with AI feedback, fostering an environment where AI serves as a tool for enhancing human learning, not replacing the cognitive processes involved in mastering new skills.

1.3. Research objectives

This study aims to explore the effectiveness of AI-assisted feedback in enhancing students' writing skills within a CLIL context. Specifically, it seeks to: (1) assess students' perceptions of the utility and clarity of AI-generated feedback, (2) evaluate the actual improvements in linguistic accuracy (i.e. grammar and spelling) in student writing as a result of this feedback, and (3) identify the challenges and limitations associated with the use of AI tools like ChatGPT in academic writing instruction. By achieving these objectives, the study intends to provide insights into the potential of AI technologies to support self-regulated learning and improve educational outcomes in higher education settings.

2. Methodology

2.1. Participants and sample

The participants in this study were 205 university students enrolled in a Data Description writing CLIL course at a major university. The course focused on business-related data topics, integrating both content and language learning objectives. Students were all part of the Business Administration Faculty and in their first or second year, with a few exceptions, divided into seven different groups. Not all students enrolled the in course were included as participants. Inclusion criteria required students to have submitted the required assignments as well as completing their writing journal for all six teacher-assessed assignments. For the survey, 192 students from the seven groups voluntarily answered the questionnaire at the end of the course. Each group accounted for about 12% to 17.2% of the respondents. A total of 336 writing pieces (168 drafts and 168 final submissions) were analyzed from the teacher-assessed assignments. The assignments evenly included a variety of business topics, such as dealerships' sales inventory, diversity and inclusion in a company's organizational structure, Real Effective Exchange Rate (REER) as an importation factor, use of social media (SNS) to build brand awareness, franchising expansion and professional talent attraction strategies.

2.2. Weekly Writing Assignments

Each week, students were tasked with writing a composition on a business-related data topic, integrating course content with language skills. The assignments were designed to be progressively challenging, covering different aspects of data description and analysis. Students maintained a weekly writing journal where they documented their drafts, feedback received, and revisions made. This journal served as both a reflective tool and a record of their learning progress.

For each assignment, students received a specific prompt for ChatGPT, which included detailed criteria to assess their writing. These criteria focused on content accuracy, grammar, and spelling. After submitting their drafts to ChatGPT, students received feedback highlighting whether or not they fulfilled the content criteria as well as areas for improvement. The feedback included suggestions for enhancing the compositions, specifically correcting grammatical and spelling errors. This iterative process of receiving and acting on feedback aimed to foster a deeper understanding of writing mechanics and subject matter.

2.3. Feedback and Revision Process

Students received different types of feedback during the course. First, students received oral feedback pre-class, where the core mistakes from previous assignments were highlighted. Second, in-class real-time corrective feedback was provided, where students willingly contributed their writing samples to a shared file in order to receive feedback from the instructor based on a comprehensive yet simple 7-point rubric and, therefore, learning from their peers' experiences. Finally, the course learners were also given post-assignment written feedback, which was provided together with their final grade for the assignment. Therefore, the AI-assisted feedback was implemented as an extra layer to subsidize the language training students needed in the course but that could not be included during the class time. Moreover, the AI-assisted feedback was intended to improve student chances to get a higher score by correcting the possible mistakes in their drafts.

Students were instructed on how to interpret and apply the feedback provided by ChatGPT. This included understanding the two different types of feedback (e.g., content vs. linguistic)

that was requested in the prompt given, as well as strategies for effective revision. The criteria analyzed by AI, which was meant to be revised by students in the writing pieces, was aligned with the rubric being used to assess their submission. Students revised their drafts based on this feedback, with the goal of submitting a polished final version.

2.4. Post-Study Survey

At the end of the 13-week course, a survey (see Appendix), in both Japanese and English, was administered to participants to evaluate their experiences with the AI-assisted writing tasks. 192 students out of the 205 answered the survey voluntarily. Students could choose to answer the survey either in Japanese or English. The survey included qualitative components with some quantitative aspects, capturing students' perceptions of the AI feedback's usefulness, clarity, and impact on their writing skills. Likert scale questions assessed overall satisfaction, perceived improvement in writing proficiency, and the efficiency of task completion. Open-ended questions allowed students to provide detailed feedback on their experiences and suggestions for improvement. There was only one multiple-option question to quantify which aspect of students' learning was considered the most beneficial.

Answers from the open-ended questions were coded to identify recurring themes and insights regarding the AI-assisted learning experience. This qualitative data was analyzed using thematic analysis to uncover common patterns and unique perspectives shared by the students. Answers not providing any input on the AI-assisted feedback were discarded. Additionally, the survey did not discriminate, in terms of understandability, between the feedback provided towards the content, based on the set criteria, and the language features, namely grammar and spelling.

2.5. Coding and Analysis of Writing Samples

A sample of the students' writing compositions was selected for detailed analysis (n=336). This involved coding the samples to identify specific linguistic enhancements, namely grammar and spelling errors. Even though the provided AI-assisted feedback also included commentary on the criteria to improve the content of the writing pieces, the analysis for this study only focused on the linguistic aspect of the feedback. The findings from this analysis provided evidence of the linguistic improvements facilitated by the AI feedback.

Considering that there were three other layers of feedback during the course, the analysis only included grammar and spelling mistakes pointed out in the feedback provided by ChatGPT. Other types of unsolicited comments on style, readability, clarity, and so on were not included in the analysis of the sample. The analysis included both the number of errors found in the writing drafts (N=168) for both aspects as well as the number of issues that students resolved in their final assignment submissions (N=168), based on the provided feedback.

3. Results

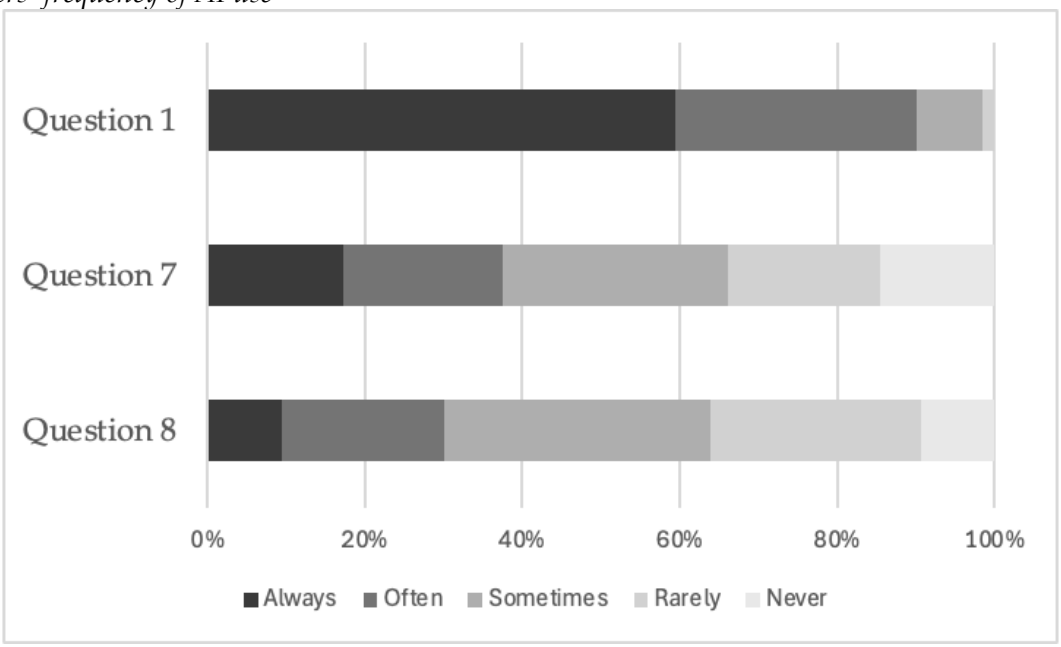
3.1. Survey on students' perceptions on using AI-assisted feedback

The results from the 192 responses of the survey, regarding the frequency of AI use (see Figure 1), reveal distinct patterns in student engagement with ChatGPT. For Question 1, which asked how often students read feedback from ChatGPT to improve their paragraphs, a significant majority of students frequently engaged with the AI feedback, with a majority (90.1%) reporting "always" or "often" using this technology. This indicates a high level of reliance on AI feedback for paragraph improvement. In contrast, for Question 7, which inquired about the

use of ChatGPT for writing assignments beyond the Writing Journal (such as asking questions, generating ideas, or seeking explanations), the frequency was more varied. Only 35.5% of students reported using ChatGPT often or more frequently for these purposes. The most common response was "sometimes," at 28.6%, reflecting a moderate level of reliance on the AI tool for additional writing support. Regarding the use of ChatGPT during class (Question 8), the frequency was generally lower. Only 26.5% of students reported using the tool in class often or every time. A significant portion of the students (53.1%) used it less frequently during class activities. This data suggests that while ChatGPT is a popular tool for improving paragraphs, its use for other writing tasks and in-class activities is more sporadic, indicating varying levels of integration and reliance on AI tools across different learning contexts.

Figure 1.

Learners' frequency of AI use

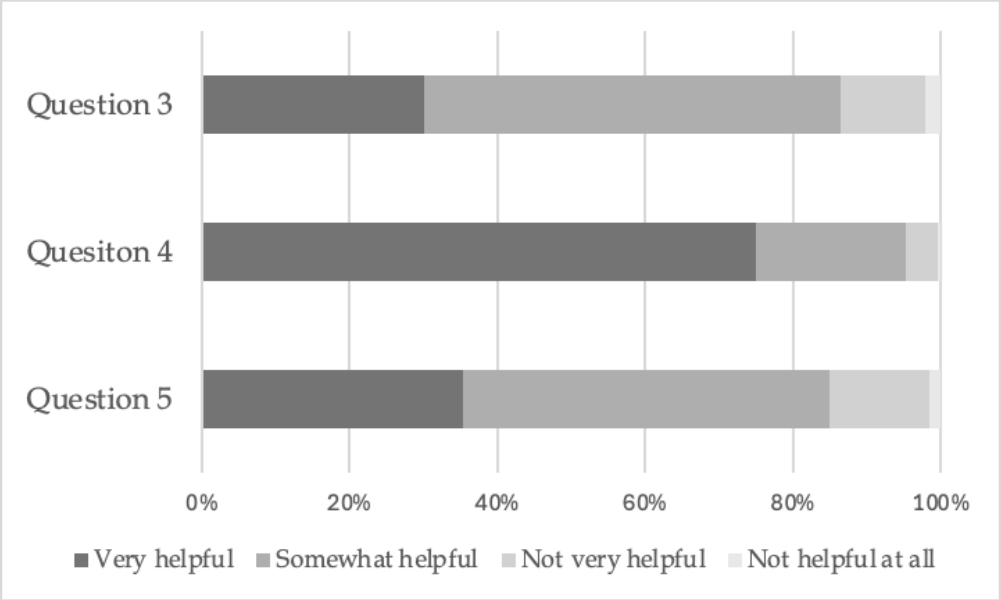


Source: Author (2024)

The data (Figure 2) reveals insightful patterns regarding the usefulness of this AI for different aspects of writing. For Question 3, which asked about the helpfulness of ChatGPT in improving grammar, a significant 86.5% of students found it either "very helpful" or "somehow helpful." Similarly, for Question 4, focusing on spelling, an overwhelming 95.3% of students rated the tool under the same categories, indicating a high level of satisfaction with its assistance in linguistic corrections. Question 5, which assessed the overall assistance of ChatGPT in meeting the evaluation criteria (content) for the writing assignments, showed that 84.9% of students found it "very helpful or somehow helpful." Aligning these results with data from Question 9 about the specific aspects in which ChatGPT helped with in learning, 29.7% of students indicated grammar as a helpful aspect, which closely aligns with Question 3. For spelling, 42.2% reported ChatGPT's assistance, consistent with the strong positive response in Question 4. Overall, the data suggests that ChatGPT is highly effective for improving linguistics aspects of the students' assignments as well as helping them meet content criteria in their writing drafts which, consequently, indicates how AI supports enhancing learners' writing skills in both language mechanics and content accuracy.

Figure 2.

AI usefulness in linguistic and content improvement for writing assignments



Source: Author (2024)

On the other hand, responses to Question 2, "How easy was it to understand the feedback provided by ChatGPT?" shed some meaningful light on how comprehensive the feedback provided was. Even though the data revealed that 39% of students found it somewhat easy to understand, 42.2% reported it was "sometimes easy sometimes not", while the remaining 18.8% found it to be difficult. This suggests that students sometimes struggle to understand the AI-assisted feedback and therefore there may lie challenges in applying the suggestions given. In that respect, students were asked to provide positive and negative aspects about using ChatGPT to receive feedback on their writing assignments and their responses were aggregated in Table 1.

Table 1.

Positive and negative aspects summary of AI-assisted writing feedback

Positive Aspects	N	**Negative Aspects**	N
Grammar Correction	72	Unclear or Complex Feedback	33
Spelling Correction	75	Incorrect or Irrelevant Suggestions	31
Error Identification	35	Over-reliance on AI	18
Improved Writing Clarity and Structure	29	Ambiguity in Feedback	17
Immediate Feedback	26	Conflict with Teacher Feedback	15
Overall Writing Improvement	21	Difficulty in Following AI's Suggestions	12
Learning New Vocabulary and Phrases	17	Reduced Critical Thinking	11
Total	**275**	**Total**	**137**

Source: Author (2024)

Regarding the positive aspects (Question 10a), students frequently mentioned grammar (72 mentions) and spelling correction (75) as significant benefits. 35 students also appreciated ChatGPT's ability to identify errors and 29 highlighted the support to improve writing clarity and structure. Other aspects included as positive outcomes were the immediacy of feedback, learning new vocabulary and phrases and an overall improvement in writing. Conversely, in

Question 10b, students pointed out several negative aspects. There were 64 mentions of students pointing out that the feedback could be unclear or complex, as well as incorrect or irrelevant. This proves that students can identify, to some extent, when AI-assisted feedback is not providing the support they are looking for. Other negative aspects included on students' answers were over-reliance on AI, conflicts between AI and teacher feedback and ambiguity in feedback. Finally, it is clear that students are able to identify the pros and cons of using ChatGPT for receiving feedback. Therefore, it is logical to see their response to Question 6, "How likely would you use ChatGPT again to improve your writing assignments?" showing that 44.8% of students were "very likely" to use it again, while 31.3% were "probably" inclined to use it in the future. This data highlights the generally positive reception of AI-assisted feedback while also pointing out areas where improvements are needed.

3.2. Writing sample analysis

The analysis included 336 writing pieces from a single class group, covering six different assignments. The data revealed significant findings regarding the effectiveness of ChatGPT in identifying and correcting grammatical and spelling errors. ChatGPT identified a total of 206 grammar mistakes and 117 spelling mistakes across the students' assignment drafts. From the feedback provided, students were able to correct 163 of the grammar mistakes and 94 of the spelling mistakes, resulting in correction rates of 79.1% and 80.3%, respectively (Table 2), found in the final assignment submissions. This indicates a high level of effectiveness in the AI's ability to help students rectify errors in their writing. It is important to note that other linguistic errors, such as those related to vocabulary, semantics, and register, were not included in this analysis due to the specific focus of the weekly prompts on grammar and spelling. The feedback provided by ChatGPT varied widely, ranging from direct suggestions for corrections to detailed grammatical explanations or simply pointing out the sections containing mistakes. This variation in feedback style demonstrates the AI's versatility in addressing different types of errors and providing students with multiple forms of assistance.

Table 2.

Student Correction Rates Based on AI-Assisted Feedback

Category	Total Mistakes	Mistakes Corrected	Correction Rate (%)
Grammar	206	163	79.1
Spelling	117	94	80.3

Source: Author (2024)

4. Discussion

The findings from this study demonstrate the significant impact of AI-assisted feedback, particularly using ChatGPT, on improving students' writing skills in a CLIL context. The results align with existing literature, highlighting both the advantages and challenges of integrating AI in language learning.

One of the primary benefits observed in this study was the high correction rates for grammatical and spelling errors. ChatGPT identified a total of 206 grammar mistakes and 117 spelling mistakes across the assignments. Students successfully corrected 79.1% of grammar mistakes and 80.3% of spelling mistakes based on the feedback provided. This high correction rate underscores the effectiveness of AI tools in facilitating immediate and accurate feedback, which is essential for learning and self-regulation in language education. Similar findings have been reported by Ranalli et al. (2017), who noted that automated feedback systems

significantly enhance students' ability to self-correct errors, thereby promoting more effective learning.

Moreover, the survey data indicated that a significant majority of students found ChatGPT helpful for improving various linguistic aspects of their writing. Specifically, 86.5% of students found ChatGPT to be helpful for improving grammar, and 95.3% reported the same for spelling. These findings resonate with Alzahrani and Alotaibi (2024), who found that AI-based feedback substantially benefits EFL learners by providing detailed and actionable feedback on their writing. Additionally, students appreciated the immediacy of AI feedback, which allowed them to make real-time corrections and improve their drafts before final submission. This aligns with the literature suggesting that immediate feedback is crucial for effective learning and self-regulation (Zawacki-Richter et al., 2019).

Despite these advantages, the study also highlighted several challenges associated with AI-assisted feedback. One significant issue was the difficulty some students faced in understanding the feedback provided by ChatGPT. 61% of students reported that the feedback could be difficult to understand. This complexity in feedback comprehension can reduce its effectiveness, as noted by Karataş et al. (2024), who emphasized that AI tools like ChatGPT can generate feedback that, while detailed and comprehensive, may sometimes be too complex or not entirely aligned with the specific needs of the learner. Furthermore, another challenge was the potential over-reliance on AI tools, which could undermine students' critical thinking and problem-solving skills. Some students expressed concerns that relying heavily on ChatGPT for corrections might lead to a passive learning attitude. This aligns with the observations by Dai et al. (2023), who stressed the importance of maintaining a balance between AI assistance and traditional teaching methods to foster active learning and critical engagement with feedback.

The positive reception of ChatGPT among students suggests that AI tools have a valuable role in modern educational settings. However, the identified challenges highlight the need for continuous refinement of AI feedback mechanisms. A significant limitation of this study is that the feedback itself was not analyzed in detail. Further research is needed to evaluate the complexity of the language used in the feedback, the clarity of the instructions given, and the appropriateness of the suggested corrections, despite all the students using the same prompt. It was also observed that some comments provided by ChatGPT led students to make unnecessary corrections and, in a few instances, introduced mistakes where there were none. Understanding these nuances will be essential for improving AI feedback systems.

5. Conclusions

This study highlights the potential benefits and challenges of integrating AI-assisted feedback, particularly through tools like ChatGPT, in CLIL contexts. The study demonstrates that AI tools can, to some extent, improve students' writing skills by providing immediate and specific feedback, as evidenced by the high correction rates for grammatical and spelling errors. This aligns with existing literature, emphasizing the effectiveness of AI in promoting self-regulation and enhancing learning outcomes.

However, the study also reveals several challenges that need to be addressed. Some students found the feedback difficult to understand, sometimes inaccurate or irrelevant, indicating a need for refining AI feedback mechanisms. Additionally, the influence of over-using or over-relying on AI tools poses a risk to the students' development of cognitive soft skills, such as critical thinking and problem-solving skills. These challenges highlight the necessity for

ongoing improvements to ensure that AI feedback is clear, relevant, and supportive of genuine learning processes.

As the feedback provided by ChatGPT was not analyzed in terms of content in this study, future research should focus on how and if the feedback provided helped students improve their writing skills within the given business themes. Moreover, it would be important to analyze the variation of comments offered by ChatGPT using one single prompt and how accurately follows the stated assessment criteria. Additionally, the survey did not discriminate between content and language feedback, so that students' responses should be considered holistically. Finally, further studies should include the intricacies of inaccurate and illusional responses given in AI-generated feedback and its impact on language learning.

Educators should focus on integrating AI tools as supplementary aids, ensuring they complement traditional teaching methods rather than replace them. Additionally, there is a need for further research into developing more user-friendly AI feedback systems that can provide clear, relevant, and context-specific guidance to learners. While AI-assisted feedback presents substantial benefits for language learning in CLIL contexts, addressing its challenges is crucial for maximizing its effectiveness and ensuring a balanced, holistic approach to education.

6. References

Alzahrani, F. K. J., & Alotaibi, H. H. (2024). The impact of artificial intelligence on enhancing EFL writing skills among high school students. *Journal of Educational and Human Sciences*, 34, 226-239. https://doi.org/10.33193/JEAHS.34.2024.482

Cao, S., & Zhong, L. (2023). Exploring the effectiveness of ChatGPT-based feedback compared with teacher feedback and self-feedback: Evidence from Chinese to English translation. *arXiv*. https://doi.org/10.48550/arXiv.2309.01645

Coyle, D., Hood, P., & Marsh, D. (2010). *CLIL: Content and Language Integrated Learning*. Cambridge University Press. https://doi.org/10.1016/j.system.2011.01.001

Dai, W., Lin, J., Jin, H., Li, T., Tsai, Y. S., Gašević, D., & Chen, G. (2023). *Can large language models provide feedback to students? A case study on ChatGPT*. IEEE International Conference on Advanced Learning Technologies (ICALT), 2023, pp. 323–325. http://dx.doi.org/10.35542/osf.io/hcgzj

Huang, W., Hew, K. F., & Fryer, L. K. (2022). Chatbots for language learning—Are they really useful? A systematic review of chatbot-supported language learning. *Journal of Computer Assisted Learning*, *38*(1), 237-257. https://doi.org/10.1111/jcal.12610

Karataş, F., Abedi, F. Y., Gunyel, F. O., Karadeniz, D., & Kuzgun, Y. (2024). Incorporating AI in foreign language education: An investigation into ChatGPT's effect on foreign language learners. *Education and Information Technologies*. https://doi.org/10.1007/s10639-024-12574-6

Loyola Innaci, D., & Helan Jona, P. (2024). AI in second language learning: Leveraging automated writing assistance tools for improving learners' writing task assessment. *Jamal Academic Research Journal-An Interdisciplinary* (JARJ), *5*(1).

Ranalli, J., Link, S., & Chukharev-Hudilainen, E. (2017). Automated writing evaluation for formative assessment of second language writing: Investigating the accuracy and usefulness of feedback as part of argument-based validation. *Educational Psychology*, *37*(1), 8-25. https://doi.org/10.1080/01443410.2015.1136407

Shintani, N., & Ellis, R. (2013). The comparative effect of direct written corrective feedback and metalinguistic explanation on learners' explicit and implicit knowledge of the English indefinite article. *Journal of Second Language Writing*, *22*(3), 286-306. https://doi.org/10.1016/j.jslw.2013.03.011

Son, J.-B., Ružić, N. K., & Philpott, A. (2023). Artificial intelligence technologies and applications for language learning and teaching. *Journal of China Computer-Assisted Language Learning*. https://doi.org/10.1515/jccall-2023-0015

Wei, L. (2023). Artificial intelligence in language instruction: impact on English learning achievement, L2 motivation, and self-regulated learning. *Frontiers in Psychology*, 14. https://doi.org/10.3389/fpsyg.2023.1261955

Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education – Where are the educators? *International Journal of Educational Technology in Higher Education*, *16*(1), 39. https://doi.org/10.1186/s41239-019-0171-0

7. Appendix

Writing Journal Survey: Using ChatGPT for feedback

During the semester, when preparing your weekly Writing Journal, you used ChatGPT to assist you with your writing assignments. Please, answer the following 10 questions at the best of your knowledge.
学期中、生徒さんは毎週のライティング・ジャーナルを作成して、ChatGPTを使ってライティング課題を支援しました。以下の10個の質問にわかる範囲でお答えください。

1) How often did you read the feedback from ChatGPT to improve your paragraph?
自分のパラグラフを改善するために、ChatGPTからのフィードバックをどの程度読みましたか？
- Always (いつも読んだ)
- Often (よく読んだ)
- Sometimes (たまに読んだ)
- Rarely (あまり読んでなかった)
- Never (全然読んでない)

2) How easy was it to understand the feedback provided by ChatGPT?
ChatGPTのフィードバックは分かりやすかったですか？
- Very easy (とても分かりやすかった)
- Easy (分かりやすかった)
- Sometimes easy sometimes not (時々分かりやすかった、時々難しかった)
- Difficult (難しかった)
- Very difficult (とても難しかった)

3) How helpful was ChatGPT to improve your grammar when writing in English?
ChatGPTは英作文の文法向上に役立ちましたか？
Very helpful (とても役に立った)
Somewhat helpful (なんとなく役に立つ)
Not very helpful (あまり役に立たない)
Not helpful at all (全然役に立たない)

4) How helpful was ChatGPT to improve your spelling when writing in English?
ChatGPTは英作文のスペルチェックに役立ちましたか？
Very helpful (とても役に立った)
Somewhat helpful (なんとなく役に立つ)
Not very helpful (あまり役に立たない)
Not helpful at all (全然役に立たない)

5) How helpful was ChatGPT in general (content) to complete your assignment?
ChatGPTは課題を完了するために、全般的に(ビジネステーマ)どの程度役に立ちましたか？
Very helpful (とても役に立った)
Somewhat helpful (なんとなく役に立つ)
Not very helpful (あまり役に立たない)
Not helpful at all (全然役に立たない)

6) How likely would you use ChatGPT again to improve your writing assignments?
ライティング課題を改善するために ChatGPT を再度使用する可能性はどの程度ありますか?
Very likely (可能性が高い)
Probably (おそらく)
Maybe a little (多分ちょっとだけ)
Very unlikely (可能性が全く低い)

7) How often did you use ChatGPT to help you write your assignments besides your Writing Journal? (Such as in asking questions, ideas, explanations, etc.)
ライティング・ジャーナル以外の課題を書く際に、ChatGPTをどの程度利用しましたか？ (質問するため、アイデアを得るため、説明を受けるためなど)
Always (いつも利用しました)
Often (よく利用しました)
Sometimes (たまに利用しました)
Rarely (あまり利用しなかった)
Never (全然利用してない)

8) How often did you use ChatGPT in class?
授業中でChatGPTを使った頻度は？
Always (いつも利用しました)
Often (よく利用しました)
Sometimes (たまに利用しました)
Rarely (あまり利用しなかった)
Never (全然利用してない)

9) What aspects did ChatGPT help you in your learning:
ChatGPTは学習にどのような面で役立ちましたか:
a) grammar (文法)
b) spelling (スペル)

c) to explain business topics (ビジネストピックを説明すること)
d) to describe data (データを記述すること)
f) to find business strategies or ideas (事業戦略やアイデアを見つけるため)
g) others (他の) _____

9) In your opinion, what was positive about using ChatGPT to receive feedback on your writing assignments?
ChatGPTを使って、ライティング課題のフィードバックを受けてよかった(メリット)と思う点は何ですか？

10) In your opinion, what was negative about using ChatGPT to receive feedback on your writing assignments?
ChatGPTを使ってライティング課題のフィードバックを受けたことで、マイナスだったこと(デメリット)は何だと思いますか？

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