



COLECCIÓN CONOCIMIENTO CONTEMPORÁNEO

Aprendizaje 4.0: Inteligencia artificial, redes sociales y rol docente en la era digital

Coords.

Olga Buzón García
Carmen Romero García

Dykinson, S.L.

APRENDIZAJE 4.0:
INTELIGENCIA ARTIFICIAL, REDES SOCIALES Y ROL DOCENTE
EN LA ERA DIGITAL



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2024



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APRENDIZAJE 4.0: INTELIGENCIA ARTIFICIAL, REDES SOCIALES Y ROL DOCENTE EN LA ERA DIGITAL

Diseño de cubierta y maquetación: Francisco Anaya Benítez

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Madrid - 2024

N.º 203 de la colección Conocimiento Contemporáneo

1ª edición, 2024

ISBN: 978-84-1070-058-1

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TRANSFORMATIVE PEDAGOGY: UNLEASHING THE POTENTIAL OF GOOGLE BARD IN ACADEMIC WRITING INSTRUCTION

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1. INTRODUCTION

In the ever-evolving landscape of educational technology, this chapter delves into the transformative pedagogical possibilities of leveraging generative Artificial Intelligence (AI), specifically Google Bard, which currently operates under the name Gemini, in the realm of academic writing production in the English as a foreign language (EFL) context. When it comes to written production, both in foreign languages and mother tongues, students have recurrently sought external assistance, be it from dictionaries, the vast World Wide Web, spell-checkers, grammar checkers or dedicated tutors.

Before delving into the pedagogical proposal outlined below, I invite readers to reminisce about their experiences as language learners and journey down memory lane in order to compare past perceptions of innovation – or rather, nonconformity and deviation from the norm – with present ones. Personally, as I reflect on my student days in what seems like a black-and-white era, one example comes to mind. Back then, resorting to paperback dictionaries to check doubts or be ambitious with language while completing homework often carried a connotation akin to cheating. As a learner, I experienced a sense of unease that many of you might have also shared. There was this underlying fear of using unfamiliar words, thinking, “if I incorporate this word, the teacher will notice, and I might be penalised in some way”. This feeling was not instinctive but, instead, nurtured by a cultural context. The use of hardcopy

dictionaries was, in fact, discouraged by certain educators who expected learners to craft texts solely based on the foreign words and structures they had memorised or could recall at that instant. However, a shift occurred with more open-minded teachers questioning this approach, advocating for the use of dictionaries and encouraging learners to consult them, as it was conducive to – and part and parcel of – the learning process itself (Ard, 1982). Hardcopy dictionaries then evolved into our trusted companions. This is only an example, but the pattern repeated over time. After that, came CD-ROM dictionaries and digital encyclopedias, which proved to be a significant time-saver compared to flicking back and forth the pages to find specific information. And then, alas, the Internet. And – you guessed correctly – back to square one: the fear of the unknown. Teachers disapproved of searching for words on online dictionaries or gathering information from the Internet, while the use of print counterparts was acceptable. Apparently, when confronted with a new enemy, the previous ones did not seem as bad – or maybe they were not as bad, to begin with. Bear with me, there is a point behind all this. The story surely rings a bell, as it repeats itself with any innovation that comes our way, and now is the turn of AI. However, a difference between the use of AI and the Internet in its early days lies in the democratisation of access. Access to a PC (and I mean only PC as no other devices could connect to the cyberspace – as it was called) was not available to the average working-class family in the advent of the Internet. Access to any sort of information back then was not at our fingertips. With the passage of time, there was a feeling of being able to control the situation among teachers. It could not get out of hand because only a few could make use of these resources, although never efficiently, as digital skills were not a concept or a reality yet. Nevertheless, in Western society today, most students with developed digital literacy skills have access to at least one device and often to several ones with an internet connection and, thus, access to AI tools within their reach, which was not the case in the past when only affluent households could afford the latest technology. Hence, the potential apprehension surrounding AI in education might stem not only from the difficulty for teachers to distinguish between human and machine-produced work (Dale & Viethen,

2021; Godwin-Jones, 2022) but also from the prospect of its widespread use without teacher oversight or control. When thought about it, in the same way that new ways of accessing information caused apprehension in educators in the past, so does AI today. In the future, teachers and learners might come to regard AI in a manner similar to our present perception of hardcopy or online dictionaries.

1.1. PREVIOUS STUDIES AND BACKGROUND

It is indisputable that AI is revolutionising and posing challenges to conventional perspectives in several spheres, and education is no exception (Holmes et al., 2022). Artificial intelligence in education, as PCs before it or any innovation that comes out to the market, is not without its detractors — on both sides: educators and learners. However, there is no doubt that it has transformed the educational landscape by providing personalised learning experiences (Berding et al., 2022; Malik et al., 2023; Yu & Guo, 2023; Zhu et al., 2023), enhanced assessment processes (Hooda et al., 2022; Hopfenbeck et al., 2023), heightened written production (Yan, 2023), synchronous corrective feedback (Koltovskaia, 2020; Ranalli, 2018; Ranalli & Yamashita, 2022) and intelligent tutoring systems (Alkhatlan & Kalita, 2019). This personalised approach can significantly enhance student engagement, motivation, and – sometimes – achievement (Hooda et al., 2022). Additionally, studies have shown that AI-based systems can automate grading and assessment tasks (Hooda et al., 2022; Petchprasert, 2021; Wilson & Czik, 2016), allowing more time for educators to focus on more personalised interactions with students.

Writing is a multifaceted undertaking that poses challenges, both in L1 and L2. It necessitates the development of not only low-level skills encompassing aspects such as grammar, spelling and basic sentence construction but also more complex ones, namely high-level skills), such as critical thinking, creativity, organisation of ideas, argumentation or rhetorical strategies that contribute to the quality of the text (Godwin-Jones, 2022). The fact that AI has irrupted the educational and writing production scenario raises ethical concerns regarding authenticity, creativity, recognition and credit (Dempere et al., 2023; Godwin-Jones,

2022; Pourhoseingholi et al., 2023), which causes a dilemma in language educators who assess such work (Godwin-Jones, 2022). The fact that students might use AI in their assignments might be interpreted as a necessary shift in education. Firstly, the type of assignments that students need to complete should probably be reconsidered – or at least, some modifications should be made. Secondly, the role of the teacher should be readjusted. The conventional authoritative figure, possessing knowledge and assessing students' work, should evolve into a role of collaborator and guide, where a learning dialogue is established with the learner (Li, 2021; Tapalova & Zhiyenbayeva, 2022; Wang, 2021).

Technology is ubiquitous, and so is AI specifically – or will be; therefore, its existence cannot be denied. Hence, its incorporation into classroom dynamics should be contemplated, although it will demand meticulous ethical considerations that will be detailed in this proposal. To successfully implement AI into education, teachers should first acquaint themselves with and test the technology (Kim & Kim, 2022). Teachers' familiarity and comfort with the tool can significantly contribute to its integration into the classroom (Wood et al., 2005).

It must be said that using generative AI in a language learning environment can be counterproductive, as the learner might become overly dependent on the tool and be detrimental to the learning process. However, it was deemed appropriate to implement it at this level to explore the benefits it might bring to EFL writing since they already have a strong language foundation and are considered independent learners. If structured in proportion to the learners' linguistic knowledge and writing skills, generative AI could aid boost, not just linguistic skills, but also 21st-century ones (Belland & Kim, 2021; Kim & Kim, 2022).

As we navigate the dynamic intersection of AI-powered writing technology and pedagogy, the focus of this chapter is on unravelling the potential of Google Bard, exploring how it can reshape and enhance the teaching and learning experiences within the context of academic writing. This chapter seeks to propose an innovative approach that embraces the capabilities of Google Bard to empower educators and engage learners in a more effective and transformative academic writing environment.

2. OBJECTIVES

In this section, the objectives of the pedagogical proposal focused on the integration of Google Bard as a writing assistant in the EFL writing classroom are outlined. By delineating clear objectives, this proposal aspires to provide educators with a structured approach. The objectives are the following.

- To assess the effectiveness of Google Bard in improving the academic writing skills of future translators and interpreters.
- To enhance collaborative writing and feedback processes among students.
- To investigate the impact of technology integration on student engagement and motivation in the academic writing context.

3. METHODOLOGY

In this section, we will delve into a comprehensive framework designed to ensure the effectiveness and ethical implementation of our pedagogical proposal. The methodology is structured into five key subsections, each playing a pivotal role in shaping the approach. We will begin by elucidating the rigorous process of tool selection, followed by an exploration of the learner profile. Subsequently, the intricacies of task design will be outlined, detailing how learning activities are crafted to optimise the potential of the selected tool. The assessment subsection will include the criteria employed to gauge learning outcomes, and finally, ethical considerations will be thoroughly addressed to guarantee a responsible and conscientious integration of technology into the learning environment.

3.1. TOOL SELECTION

The selection of Google Bard for the pedagogical proposal involved a systematic process, considering various factors to ensure it aligned with the activity outcomes and students' needs. Firstly, an exploration of potential AI writing tools was conducted, and the search was narrowed down to two widely recognised generative AIs, namely ChatGPT3.5 (OpenAI) and Bard (Google). The decision to opt for ChatGPT and

Bard was motivated by their popularity and user-friendly interfaces, as the familiarity of their chat-like layout was deemed advantageous as it was anticipated to be well-received. Secondly, a comparative analysis of both tools, considering their features, functionalities, ethical implications and pedagogical appropriateness was conducted. Finally, trials and demonstrations were conducted to test their efficiency and alignment with the academic goals.

Ultimately, Bard was the tool that was deemed the most appropriate for several reasons. First of all, Bard was considered more appropriate than its OpenAI counterpart due to the convenience of learners not requiring separate sign-ins, as access was granted through their institutional accounts. Otherwise, students would have had to create a ChatGPT account for this task, raising ethical concerns. Second of all, when prompted to rephrase sentences, Bard provided feedback, a feature which is not present in ChatGPT, unless explicitly requested. Moreover, it incorporated justifications for the modifications made.

3.2. LEARNER PROFILE

This pedagogical proposal has been designed to be implemented in the English module taught in the second year of the Translation and Interpreting degree at a Spanish university. The participants are a mixed group of 105 students, although not all participated in the task, of heterogeneous linguistic backgrounds, including monolingual Spanish students, bilingual in Spanish and Catalan, and another minority whose first language is neither. However, they all share a genuine interest in language learning. Forty-nine of those students are learning German, while the other fifty-six are learning French as a third languages as part of the curriculum.

Regarding their proficiency level in English, it ranges from B2 to C2. The pedagogical proposal has been developed based on the assumption that all students have acquired a B2 level, considering that most students have successfully completed the corresponding module in the first year, which is equivalent to the said level. Therefore, it was assumed that learners were already acquainted with the format of the writing tasks proposed and should be capable of meeting the minimum

standards regarding language proficiency, coherence and cohesion of a text, layout, register and content.

3.3. TASK DESIGN AND PROCEDURE

In the initial step of our didactic proposal, the teacher took the initiative to thoroughly test the chosen tool, aiming to gauge its potential effectiveness within the classroom setting (Kim & Kim, 2022). This involves hands-on experimentation to explore its functionalities and suitability for educational purposes. For this proposal, students had to complete two writings: an essay and a report in groups of four. Upon being informed of the two types of writing tasks they would have to produce, participants were tasked with forming the groups through a group-selection activity facilitated in the institutional virtual classroom, operated with Moodle. Small groups can prove advantageous provided they enable fair participation from all group members, facilitate ample interaction time, and foster the provision and acceptance of feedback (González-Lloret, 2020). However, challenges might arise at this point as some students who have not attended previous lessons might struggle to find groups, leading to variations in group sizes, with some groups having fewer than four members. After that, the teacher provided clear and concise instructions about the upcoming tasks, ensuring all students comprehend the objectives and expectations. Subsequently, the teacher demonstrated how to utilise the selected tools, such as GBard and GDocs, to support collaborative work and text creation. After that, the tasks were detailed, explaining what was expected in each of them. In this step, the format, functional language, register and organisation of both writings were specified. For the essay, learners were given the following instructions:

You and your team have listened to a podcast about bridging cultural gaps between people of different nationalities and cultures. Write a collaborative essay discussing different ways to promote intercultural understanding. You should explain which way you think is more effective, giving reasons to support your opinion. (Taken and adapted from *Burlington International English C1 Student's Book*, 2nd Ed (2022))

In composing the essay, students had the option to either complete it independently or with the assistance of the aforementioned artificial

intelligence software. A digital survey was created to indicate their group's preference. In the event that AI-assisted writing was chosen, each member had to contribute about 150 words, whereas if the traditional method was selected, they had to write about 200 words each. This disparity in word production was meant to compensate for the time spent writing the accurate prompts to feed Bard. When engaged with the tool, students would modify prompts accordingly gradually refining and carefully selecting the most precise words to achieve the desired quality text outcome (Belland & Kim, 2021). By the same token, there were two different report tasks. If students had decided to produce their essays with the aid of Bard, then they would complete Option A, whereas if the opposite was true, they would complete Option B (see below). Despite the enthusiasm for novelty that might arise, it was deemed of paramount importance to offer an alternative to AI-supported writing production for ethical concerns, in order to ensure an equitable and democratic environment.

Option a): AI tool

You have written an essay for your English lesson using an AI tool. While completing the task, you have taken some notes on the use of generative AI in academic writing. Now your teacher has asked you to write a collaborative report about your experience. In your report, you should evaluate the software, explaining how it was or was not useful and whether it met your expectations, including examples of your text and prompts fed to the programme and adding the pros and cons of implementing AI software for writing in foreign language classes. Finally, add some suggestions/recommendations for its use.

Each member must write about 200 words. Write your report in an appropriate style.

Option b): Traditional method

Your university has forbidden the use of AI tools and has forced a return to pen-and-paper continuous assessment activities but not all members of the student and lecturer bodies agree with this decision. The vice-chancellor of studies has asked you to conduct a survey and write a report. Your report should discuss how students and faculty members feel about the use of AI in education. You have also been asked to make recommendations about how it could be used.

Each member must write about 250 words. Write your report in an appropriate style.

To manage project timelines effectively and alleviate student stress, the class then agreed upon a due date, allowing students to propose deadlines that accommodate everyone's schedules. Once tasks were assigned within the groups, students created the shared GDocs and distributed responsibilities amongst team members. With tasks allocated, students commenced work, supported by ongoing peer feedback within their groups. The writing process should be carried out on GDocs, considering that it creates a history for all the participants' contributions, in other words, it logs all modifications, which can be key in avoiding group tensions or unfair grading. The said GDoc files would be created by one of the group members and shared with the rest of the team members as well as with the lecturer with editing roles, following the document-labelling instructions provided in the virtual classroom for the sake of organisation. By granting editor permissions to the lecturer at the initial stages of the writing process, the lecturer would be able to monitor the progress, having the opportunity to offer learners timely feedback as appropriate before the due date. Additionally, during the writing process of both tasks, students were meant to provide peer feedback on all the group members' contributions by using the suggestion or comment tools on GDocs. This was done with the intention that, theoretically, the resulting piece of writing would be a coherent whole, with everyone's footprint throughout rather than just piecing together individual fragments.

Regarding the use of GBard as a support writing tool for the essay, students were given free rein with the only restriction of not feeding the tool any personal information such as names, ID numbers or similar. They could use it to brainstorm ideas (Bin-Nashwan et al. 2023), find synonyms, rephrase sentences, correct grammatical errors or improve their productions, for instance, always within the ethical and moral confines of academic standards. To put it differently, Google Bard could be used as a tutor (Alkhatlan & Kalita, 2019) who provides individualised instant feedback (Hooda et al., 2022). Regardless of the use, it would then be detailed in the report.

3.4. ASSESSMENT

The evaluation of the writing assignment, for both tasks, aligns with the criteria set forth by Cambridge English Assessment in their C1 level

exams (i.e. Advanced). The said guidelines included descriptors for content, communicative achievement, organisation and language. These items evaluated different features. Firstly, the criteria assess whether the texts produced by learners addressed the given task; secondly, the effectiveness of the communicative action, including the ability to maintain a consistently appropriate register and tone; thirdly, textual clarity, coherence and organisation of ideas, in which the appropriate use of linking devices is considered key; lastly, the variety and complexity of vocabulary and sentence structures employed.

FIGURE 1. Writing assessment criteria.

C1	Content	Communicative Achievement	Organisation	Language
5	All content is relevant to the task. Target reader is fully informed.	Uses the conventions of the communicative task with sufficient flexibility to communicate complex ideas in an effective way, holding the target reader's attention with ease, fulfilling all communicative purposes.	Text is a well-organised, coherent whole, using a variety of cohesive devices and organisational patterns with flexibility.	Uses a range of vocabulary, including less common lexis, effectively and precisely. Uses a wide range of simple and complex grammatical forms with full control, flexibility and sophistication. Errors, if present, are related to less common words and structures, or occur as slips.
4	<i>Performance shares features of Bands 3 and 5.</i>			
3	Minor irrelevances and/or omissions may be present. Target reader is on the whole informed.	Uses the conventions of the communicative task effectively to hold the target reader's attention and communicate straightforward and complex ideas, as appropriate.	Text is well organised and coherent, using a variety of cohesive devices and organisational patterns to generally good effect.	Uses a range of vocabulary, including less common lexis, appropriately. Uses a range of simple and complex grammatical forms with control and flexibility. Occasional errors may be present but do not impede communication.
2	<i>Performance shares features of Bands 1 and 3.</i>			
1	Irrelevances and misinterpretation of task may be present. Target reader is minimally informed.	Uses the conventions of the communicative task to hold the target reader's attention and communicate straightforward ideas.	Text is generally well organised and coherent, using a variety of linking words and cohesive devices.	Uses a range of everyday vocabulary appropriately, with occasional inappropriate use of less common lexis. Uses a range of simple and some complex grammatical forms with a good degree of control. Errors do not impede communication.
0	Content is totally irrelevant. Target reader is not informed.	<i>Performance below Band 1.</i>		

Source: Cambridge English Assessment (2020). Assessing writing for Cambridge English Qualifications: A guide for teachers - C1 Advanced. UCLES

Furthermore, the feedback provision included suggestions for improvement, comments on the positive and negative aspects of language use and text organisation, for which emojis were included to find an approachable tone.

3.5. ETHICAL ISSUES

The research design has undergone rigorous ethical review, ensuring compliance with ethical guidelines. The ethical landscape of this research is multifaceted and requires careful examination of the implications of learners' participation. First and foremost, learners could not be required to use or register in a non-institutional tool. Therefore, given the institutional use of Google Workspace tools, it was deemed appropriate to use Bard instead of other generative AI tools in which sign-up would be required. Furthermore, task completion with the support of an AI tool could not be imperative. Therefore, students were given two possible ways of completing the task: with Bard or without it. Moreover, learners were asked to be cautious with sensitive data, as prompts fed to generative AI might be used to train the language models. Furthermore, when Gen-AI is used in education, some ethical issues might also involve the authenticity of the text. This is particularly pertinent as the tool's contribution to the text essentially renders it *de facto* a co-creator (Dempere et al., 2023; Godwin-Jones, 2022; Pourhoseingholi et al., 2023).

4. ANTICIPATED RESULTS AND DISCUSSION

When introducing innovation, there are invariably advocates and critics. Regarding the educational realm, some individuals may be well-disposed to try less conventional approaches to teaching and learning, such as new AI or new technologies, in general (Barros et al., 2023). However, there may be others who might be resistant to deviate from traditional approaches and prefer established methods. The integration of generative AI as a writing assistant in education is no less, and it might likely generate divided opinions among education stakeholders. While its supporters might be eager to embrace the advantages it offers in enhancing their writing skills and efficiency, its detractors might approach it with a pinch of salt.

This pedagogical initiative is poised to yield positive results. In relation to the first objective, in the first place, a notable improvement in the organisation of ideas is anticipated. In the second place, we also envision a positive impact on the language variety regarding structural and lexical complexity. In the third place, it is believed that learners might be able to streamline their workflow, allocating time more effectively. Generative AI, with its capacity to instantly generate content and provide assistance, might be perceived as a valuable time-saving tool. Conversely, despite the expected benefits, there may be limitations. Among the participants who decide to employ Bard for their writings, some might find it unhelpful, leading to questioning its effectiveness in genuine learning and intellectual development (Kim & Kim, 2022). There is a strong likelihood that learners over-rely on generative AI, which is a potential hindrance — and peril — to the cultivation of critical thinking skills and the creation of knowledge (Malik et al., 2023). This degree of dependency might compromise academic integrity (Bin-Nashwan et al., 2023), which can prompt a cautious attitude in education stakeholders. Another expected outcome from the implementation of this pedagogical proposal might be concerns about the authorship of the work produced for both educators and learners (Dempere et al., 2023; Godwin-Jones, 2022; Pourhoseingholi et al., 2023). Potential involuntary plagiarism by generative AI software or authenticity may lead students and lecturers to prefer traditional approaches to writing, where the emphasis is placed on individual effort and creative expression.

As for the second objective, it might be inferred, based on previous research, that collaborative writing activities stimulate critical thinking, given that students are expected to engage in discussion (González-Lloret, 2020; Hammond, 2017) and negotiate ideas to produce a coherent and cohesive written piece. By the same token, teamwork and communication skills are also developed. Learners might learn from different writing styles and perspectives as well. In regard to the third objective, literature shows that student engagement and motivation can be boosted with the integration of technology, thus, it can be presupposed that with generative AI it may also be the case. Yet, high-quality performance is not assured.

5. CONCLUSIONS

Educators and learners may find themselves navigating uncharted territory as AI becomes increasingly ingrained in educational methodologies, like any other previous technological advancements. Pedagogically speaking, the rapid integration of AI into education brings forth transformative changes, presenting both students and teachers with a paradigm shift in the learning landscape. It must be acknowledged that while the potential benefits can be immense, it is crucial to understand that not all students and educators may be prepared to welcome these changes. The challenge lies not only in adapting to the evolving technological landscape but also in ensuring that adequate support and resources are provided to equip both students and teachers to develop new digital skills to adapt to the new revolution. Furthermore, balancing the enthusiasm for technological advancements with a thoughtful consideration of ethical implications is essential in fostering a constructive dialogue about the role of AI in academic settings. When implementing generative AI technologies in the classroom, it is of paramount importance that students are guided through the process step by step. In that process, it is advisable to delineate the rules. Establishing at the outset of the activity how to use it or what is acceptable is paramount to avoid ethical conflicts.

6. REFERENCES

- Alkhatlan, A., & Kalita, J. (2019). Intelligent Tutoring Systems: A Comprehensive Historical Survey with Recent Developments. *International Journal of Computer Applications*, 181(43). <https://doi.org/10.5120/ijca2019918451>
- Ard, J. (1982). The Use of Bilingual Dictionaries by ESL Students while Writing. *ITL - International Journal of Applied Linguistics*, 58, 1–27. <https://doi.org/10.1075/itl.58.01ard>
- Barros, A., Prasad, A., & Śliwa, M. (2023). Generative artificial intelligence and academia: Implication for research, teaching and service. *Management Learning*, 54(5), 597–604. <https://doi.org/10.1177/13505076231201445>
- Belland, B. R., & Kim, N. J. (2021). Predicting high school students' argumentation skill using information literacy and trace data. *Journal of Educational Research*, 114(3), 211–221. <https://doi.org/10.1080/00220671.2021.1897967>

- Berding, F., Riebenbauer, E., Stütz, S., Jahncke, H., Slopinski, A., & Rebmann, K. (2022). Performance and Configuration of Artificial Intelligence in Educational Settings. Introducing a New Reliability Concept Based on Content Analysis. *Frontiers in Education*, 7. <https://doi.org/10.3389/educ.2022.818365>
- Bin-Nashwan, S. A., Sadallah, M., & Bouteraa, M. (2023). Use of ChatGPT in academia: Academic integrity hangs in the balance. *Technology in Society*, 75. <https://doi.org/10.1016/j.techsoc.2023.102370>
- Dale, R., & Viethen, J. (2021). The automated writing assistance landscape in 2021. *Natural Language Engineering*, 27, 511–518. <https://doi.org/10.1017/S1351324921000164>
- Dempere, J., Modugu, K., Hesham, A., & Ramasamy, L. K. (2023). The impact of ChatGPT on higher education. In *Frontiers in Education* (Vol. 8). Frontiers Media SA. <https://doi.org/10.3389/educ.2023.1206936>
- Godwin-Jones, R. (2022). Partnering with AI: Intelligent writing assistance and instructed language learning. *Language Learning & Technology*, 26(2). <http://doi.org/10125/73474>
- González-Lloret, M. (2020). Collaborative tasks for online language teaching. *Foreign Language Annals*, 53(2), 260–269. <https://doi.org/10.1111/flan.12466>
- Hammond, M. (2017). Online collaboration and cooperation: The recurring importance of evidence, rationale and viability. *Education and Information Technologies*, 22(3), 1005–1024. <https://doi.org/10.1007/s10639-016-9469-x>
- Hooda, M., Rana, C., Dahiya, O., Rizwan, A., & Hossain, M. S. (2022). Artificial Intelligence for Assessment and Feedback to Enhance Student Success in Higher Education. *Mathematical Problems in Engineering*, 2022. <https://doi.org/10.1155/2022/5215722>
- Hopfenbeck, T. N., Zhang, Z., Sun, S. Z., Robertson, P., & McGrane, J. A. (2023). Challenges and opportunities for classroom-based formative assessment and AI: a perspective article. *Frontiers in Education*, 8. <https://doi.org/10.3389/educ.2023.1270700>
- Kim, N. J., & Kim, M. K. (2022). Teacher's Perceptions of Using an Artificial Intelligence-Based Educational Tool for Scientific Writing. *Frontiers in Education*, 7. <https://doi.org/10.3389/educ.2022.755914>
- Koltovskaia, S. (2020). Student engagement with automated written corrective feedback (AWCF) provided by Grammarly: A multiple case study. *Assessing Writing*, 44. <https://doi.org/10.1016/j.asw.2020.100450>

- Li, J. (2021). Research on Intimacy between Teachers and Students in English Classrooms in the Context of Artificial Intelligence. *Proceedings - 2021 International Conference on Forthcoming Networks and Sustainability in AIoT Era, FoNeS-AIoT 2021*, 43–46. <https://doi.org/10.1109/FoNeS-AIoT54873.2021.00019>
- Malik, A. R., Pratiwi, Y., Andajani, K., Numertayasa, I. W., Suharti, S., Darwis, A., & Marzuki. (2023). Exploring Artificial Intelligence in Academic Essay: Higher Education Student's Perspective. *International Journal of Educational Research Open*, 5. <https://doi.org/10.1016/j.ijedro.2023.100296>
- Petchprasert, A. (2021). Utilizing an automated tool analysis to evaluate EFL students' writing performances. *Asian-Pacific Journal of Second and Foreign Language Education*, 6(1), 1–17. <https://doi.org/10.1186/s40862-020-00107-w>
- Pourhoseingholi, M. A., Hatamnejad, M. R., & Solhpour, A. (2023). Does chatGPT (or any other artificial intelligence language tool) deserve to be included in authorship list? *Gastroenterology and Hepatology from Bed to Bench*, 16(1), 435–437. <https://doi.org/10.22037/ghfbb.v16i1.2747>
- Ranalli, J. (2018). Automated written corrective feedback: how well can students make use of it? *Computer Assisted Language Learning*, 31(7), 653–674. <https://doi.org/10.1080/09588221.2018.1428994>
- Ranalli, J., & Yamashita, T. (2022). Automated written corrective feedback: Error-correction performance and timing of delivery. *Language Learning & Technology*, 2022(1), 1–25. <http://hdl.handle.net/10125/73465>
- Tapalova, O., & Zhiyenbayeva, N. (2022). Artificial Intelligence in Education: AIEd for Personalised Learning Pathways. *The Electronic Journal of E-Learning*, 20(5), 639–653.
- Wang, C. (2021). The value orientation of teachers' role in artificial intelligence teaching environment based on information technology. *ACM International Conference Proceeding Series*, 951–954. <https://doi.org/10.1145/3482632.3483059>
- Wilson, J., & Czik, A. (2016). Automated essay evaluation software in English Language Arts classrooms: Effects on teacher feedback, student motivation, and writing quality. *Computers and Education*, 100, 94–109. <https://doi.org/10.1016/j.compedu.2016.05.004>
- Wood, E., Mueller, J., Willoughby, T., Specht, J., & Deyoung, T. (2005). Teachers' Perceptions: barriers and supports to using technology in the classroom. *Education, Communication & Information*, 5(2), 183–206. <https://doi.org/10.1080/14636310500186214>

- Yan, D. (2023). Impact of ChatGPT on learners in a L2 writing practicum: An exploratory investigation. *Education and Information Technologies*. <https://doi.org/10.1007/s10639-023-11742-4>
- Yu, H., & Guo, Y. (2023). Generative artificial intelligence empowers educational reform: current status, issues, and prospects. In *Frontiers in Education* (Vol. 8). Frontiers Media S.A. <https://doi.org/10.3389/feduc.2023.1183162>
- Zhu, T., Zhang, Y., & Irwin, D. (2023). Second and Foreign Language Vocabulary Learning through Digital Reading: A Meta-Analysis. *Education and Information Technologies*. <https://doi.org/10.1007/s10639-023-11969-1>