

Motivation from Technology Innovation in Teaching Foreign Languages: A Case Study in Vietnam

Đoàn Thị Nương*

Received on 7 February 2023. Accepted on 27 April 2023.

Abstract: Integrating technology into foreign language teaching has become increasingly common in the digital age. With the development of artificial intelligence, language learning has become more personalized, interactive, and engaging. The author interviewed lecturers and students based in a number of universities in Hanoi, to ascertain their motivation in teaching and learning foreign languages in regards to the appearance of ChatGPT. This is a large language model used in teaching and learning foreign languages in Vietnam from the perspective of innovative pedagogy. By analyzing the interview results, this paper argues that ChatGPT can motivate learners and teachers, and increase their performance. In terms of vocabulary retention, fluency, accuracy, pronunciation, and motivation in general, it helps learners get better results. Teachers therefore experience less stressful pedagogical issues. The paper also addresses the potential challenges and limitations of using ChatGPT in the Vietnamese pedagogical context, such as the amount of reliance on it, lack of positivity, plagiarism, etc.

Keywords: Motivation, technology innovation, teaching and learning foreign languages, ChatGPT, Vietnam.

Subject classification: Linguistics.

1. Introduction

Foreign language learning has become a crucial part of education in Vietnam, where English is considered a key language for global communication, economic development, and cultural exchange. However, traditional approaches to foreign language teaching often focus on grammar rules, vocabulary memorization, and teacher-centered instruction, which may not align with the needs and preferences of today's learners. Recently, there has been

* Vietnam National University, Hanoi.

Email: nuong.doan88@gmail.com

growing interest in integrating technology into language teaching to enhance learners' engagement, motivation, and performance. Artificial intelligence (AI) has emerged as a promising tool for language learning, offering personalized, adaptive, and interactive learning experiences. Among various AI-based language models, chat generative pre-trained transformer (ChatGPT) has gained attention for its ability to generate human-like text and respond to learners' inputs in real-time. This paper aims to explore the motivation behind using ChatGPT in teaching foreign languages in Vietnam from the perspective of innovative pedagogy.

The integration of this model into traditional classroom learning could have a significant impact on the foreign language education system in Vietnam. The traditional classroom setting, focused on lectures, textbooks, and rote memorization, has been criticized for its outdatedness and ineffectiveness in developing practical language skills. By supplementing this approach with ChatGPT, learners could benefit from a more interactive and engaging learning experience that fosters the development of practical language skills (de Winter, 2023).

In a classroom setting, ChatGPT could be integrated into group or individual activities (Geerling et al., 2023; Gilson et al., 2023). For example, learners could be asked to have a conversation with ChatGPT on a specific topic related to their language learning goals. This could provide speaking practice opportunities without the fear of being judged by their peers or teacher. Additionally, learners can receive feedback on their pronunciation, grammar, and vocabulary usage, helping to improve their skills.

Outside of the classroom, it is possible to use ChatGPT as a supplementary tool for learners to practice their language skills independently. Access through a mobile app or website allows learners to interact with the AI tool anytime, anywhere. This flexibility could be particularly beneficial for learners with busy schedules or limited access to language learning resources.

ChatGPT could also be used to simulate real-world language interactions. For example, learners could be presented with daily life scenarios, such as ordering food at a restaurant or asking for directions. ChatGPT could provide feedback on the learner's responses, guiding them towards more effective language usage and help instill more confidence in them when interacting with native speakers in real-life situations.

Another potential benefit of ChatGPT in foreign language teaching is giving learners instant feedback. In a traditional classroom setting, teachers may not have the time or resources to give individualized feedback to each learner. With ChatGPT, however, learners could receive immediate comments on their language usage, allowing them to make corrections and improve their skills more quickly. This is particularly beneficial for those who struggle with specific aspects of a language, such as pronunciation or grammar.

However, it is important to note that integrating ChatGPT into a traditional classroom learning environment may not be without its challenges (Han et al., 2023). One could be the need for teachers to adapt their teaching methods to incorporate ChatGPT effectively. They would need to be trained how to use the AI tool and integrate it into their lessons in a way that supports learners' language development (Hargreaves, 2023). This could require additional resources and time on the part of educators.

Moreover, some learners may feel uncomfortable interacting with an AI tool, particularly those who are more accustomed to traditional classroom learning methods (Hisan & Amri, 2023). Additionally, learners with limited access to technology or those less technologically proficient may find it difficult using this chatbot effectively (Megahed et al., 2023). Thus, it is essential to ensure that learners have adequate training and support to help them use this tool effectively.

Since its emergence in 2022, ChatGPT has gained special attention and motivated many students and lecturers to apply the software to their learning and teaching methods. The present research intends to assess the motivation of students in a number of universities in Hanoi when applying ChatGPT in learning a foreign language.

2. Literature review

2.1. Innovative pedagogy

Innovative pedagogy refers to a learner-centered and participatory approach to teaching that emphasizes learners' autonomy, collaboration, and creativity (Topsakal & Topsakal, 2022). This process is based on the principles of constructivism, which posits that learning is an active and social process that involves learners' prior knowledge, experiences, and interactions with the environment. Innovative pedagogy also emphasizes the use of technology to enhance learners' access to information, communication, and collaboration. In the context of foreign language teaching, innovative pedagogy emphasizes the integration of authentic materials, real-life situations, and learner-centered activities that promote language use in a meaningful context (Zhai, 2022). It also encourages learners to develop their language proficiency through active participation, problem-solving, and reflection (Mogali, 2023).

2.2. AI-assisted language learning

AI-assisted language learning refers to the use of AI-based technologies, such as chatbots, speech recognition, and natural language processing, to enhance language learning outcomes (Lo, 2023). It offers several advantages over traditional language

teaching methods, including personalization, adaptivity, interactivity, and feedback (Mhlanga, 2023). AI-assisted language learning can provide learners with customized learning paths based on their needs, interests, and learning styles. It can also offer immediate and accurate feedback on learners' performance, to identify their strengths and weaknesses, and adjust their learning strategies accordingly. AI-assisted language learning can also create engaging and immersive learning environments that simulate real-life language use and promote learners' motivation and confidence.

2.3. Integrating technology in teaching foreign languages in Vietnam

Integrating technology in teaching foreign languages in Vietnam can offer several benefits for learners, teachers, and the education system. *First*, technology can provide learners with personalized and interactive learning experiences that cater to their individual needs and preferences (Viet Dac Lai et al., 2022). It can generate contextualized and naturalistic language input that simulates real-life communication and fosters learners' communicative competence. Technology can also offer immediate and accurate feedback on learners' language use and help them identify areas for improvement. *Second*, technology can enhance learners' motivation and engagement by providing them with a novel and exciting learning tool that reflects their digital literacy and social identity. It can also promote learners' autonomy and creativity by allowing them to explore and express their ideas and opinions in a supportive and non-judgmental environment. *Third*, technology can support teachers in their work by providing a valuable resource for lesson planning, assessment, and feedback. It can also reduce their workload and stress by automating routine tasks, allowing them to focus on higher-order skills, such as critical thinking and problem-solving. *Finally*, integrating technology into foreign language teaching in Vietnam can contribute to the development of an innovative and sustainable education system that embraces technological advancements and prepares learners for the challenges and opportunities of the globalized world (Minh Van Nguyen et al., 2021).

However, there are also potential challenges and limitations of using technology in the Vietnamese context that needs addressing. *First*, technology may not be able to capture the cultural and linguistic nuances of the Vietnamese language, which may result in inaccurate or inappropriate responses. Technology may also reinforce or perpetuate cultural stereotypes or biases that may affect learners' attitudes and beliefs. *Second*, it may be inaccessible or unaffordable for many learners, especially those from disadvantaged backgrounds or rural areas. Technology may also require a certain level of digital literacy and language proficiency to use it effectively and this may exclude some learners. *Third*, it may raise ethical and privacy concerns related to data collection, storage, and use. There is also a risk of becoming addicted to, or dependent on, technology, which could impact on learners' mental and physical health.

Applying technology in foreign language teaching has gained significant attention in recent years. Numerous studies have been conducted exploring its potential benefits in language learning and teaching. This literature review aims to provide an overview of the existing research on the application of technology in teaching foreign languages.

One of the primary benefits of using technology for foreign language learners is its ability to provide immediate feedback. It can analyze language input and provide instant evaluation on pronunciation, grammar, and vocabulary, as well as help learners correct their mistakes and improve their language skills more quickly.

Moreover, as several studies also show, technology has been found to be effective in promoting vocabulary acquisition and retention. In addition to its impact on pronunciation as well as vocabulary retention, technology has been found to be effective in promoting fluency and accuracy. Also, in conversation practice it helps improve fluency and accuracy of intermediate-level English as a foreign language learners, as well as accuracy and complexity in writing.

It is noted that technology is effective in promoting learner autonomy and engagement in foreign language learning. As part of self-directed language learning, it can significantly improve learners' autonomy and engagement. While there is a growing body of research on the application of technology in foreign language teaching, some studies have also identified potential limitations. For example, it may not be able to provide a complete understanding of a language and culture, which can be essential for effective communication. Additionally, the accuracy of technology-generated text and feedback may vary depending on the quality of the training data used to develop the model.

The application of technology in foreign language teaching has the potential to significantly influence language learning in terms of pronunciation, vocabulary retention, fluency, accuracy, autonomy, and engagement. However, further research is needed into its long-term effectiveness of technology in language learning and teaching and to identify potential challenges and limitations.

2.4. ChatGPT

ChatGPT is a large language model that uses machine learning to generate human-like text and respond to users' inputs in real-time. It is widely used in natural language processing tasks, such as machine translation and text classification. ChatGPT is pre-trained on a large amount of text data, such as books, articles, and websites, using unsupervised learning techniques. During this pre-training, ChatGPT learns the patterns and structures of a language and develops the ability to generate coherent and contextually appropriate responses to various input prompts. It can also be fine-tuned on specific domains or tasks, such as answering questions or holding conversations, using supervised learning techniques.

Besides its successes, ChatGPT has also brought challenges and threats to education. Sallam (2023) believes that with its ability to provide specific answers to user questions, students can use it to complete their written assignments and examinations, leading to concerns about AI-assisted cheating. In response, some schools have banned access to ChatGPT fearing that their students may use it to do their work given its ability to rapidly generate acceptable texts, raising concerns of plagiarism to incorrect responses and inaccurate citations.

Therefore, the implications of ChatGPT-assisted learning require immediate attention to ensure the benefits are optimized and the drawbacks minimized. Comprehensive research is therefore necessary to gain a deeper understanding of the potential benefits and threats to education, and to examine the motivation of applying ChatGPT in learning foreign languages.

The research aims to answer the question: What are the motivations ChatGPT brings in foreign language learning in educational institutions in Hanoi?

3. Methodology

The author applied deep interview techniques to collect data on how learners responded to the issue of motivation in technology innovation, namely integrating ChatGPT in foreign language teaching and learning.

Those who took part in the research were students and lecturers from five universities in Hanoi, during January 2023. This was the period when ChatGPT was newly introduced, so it attracted lots of attention. The interviews were completed in one month and the respondents' replies were recorded and categorized into how they perceived the benefits and disadvantages of using ChatGPT in foreign language learning, rather than the author providing statistical results. Given all the interviewees had access to ChatGPT, it meant their responses could be based on their own personal experiences. The lecturers were also involved in giving information because their responses could bring a better look on how the feeling of ChatGPT get on their students. Lecturers gave their opinions on how students feel in the lessons applying ChatGPT.

4. Results

4.1. Motivation of ChatGPT on students' pronunciation

The consensus was that ChatGPT has the potential to significantly influence pronunciation. Accurate pronunciation is crucial for effective communication, and ChatGPT can provide

immediate feedback on learners' pronunciation skills, allowing them to quickly make corrections and improvements. It can identify areas where they may be struggling with pronunciation and provide targeted feedback and exercises to help them improve. Moreover, ChatGPT can help develop accurate and natural-sounding pronunciation by generating audio recordings of correct pronunciation and provide a visual representation of the pronunciation of words. It also provides a safe, non-judgmental environment for practice, building confidence and motivation for learners to continue developing their pronunciation skills.

All the interviewees believed that ChatGPT can help overcome common pronunciation challenges faced by Vietnamese learning the English language, for example, difficulties with vowel and consonant sounds, and stress and intonation. With the help of ChatGPT, learners can develop accurate and natural-sounding pronunciation, leading to more effective communication in real-life situations. This can open up new opportunities for education, work, and social interaction, which can have a significant impact on their personal and professional development.

4.2. Motivation of learners' vocabulary retention

In terms of vocabulary retention, responses from the lecturers and students were very encouraging. While students still struggle with vocabulary acquisition and retention, ChatGPT can help them to overcome these challenges through interactive and engaging exercises focused on vocabulary acquisition.

One such method is through using word associations or word games. These are designed to help learners enhance their vocabulary in fun and engaging ways. For example, ChatGPT may generate a list of words and ask learners to come up with associations or connections between the words. This can help them remember and connect the words more easily and improve their overall understanding of a language.

ChatGPT can also provide learners with personalized exercises focused on areas where they may be struggling with vocabulary retention. For example, if a learner consistently has a problem with a particular set of words or phrases, ChatGPT can provide targeted exercises and feedback to help them overcome the challenge. This is particularly beneficial for those with no access to the personalized attention of a language teacher.

Positive feedback from using ChatGPT in remembering vocabulary is that it can provide contextualized examples of how words are used in real-life situations. It can generate text examples illustrating the meaning and usage of words, showing how they are used in context. Learners can then understand the nuances of vocabulary usage and develop more natural-sounding speech. Lecturers seem to agree that ChatGPT can help learners retain vocabulary by providing them with opportunities for repetition and reinforcement through a wide a range of

focused exercises. For example, some exercises may ask them to fill in the blanks in a sentence with a particular set of words, or to match words based on their definitions.

4.3. Motivation of ChatGPT on fluency

Fluency is a critical aspect of foreign language learning. It is the ability to speak or write a language naturally with ease and accuracy. Becoming fluent is especially important, and most learners feel that ChatGPT can help them with interactive and engaging exercises focused on developing their speaking and writing skills.

They say that ChatGPT can assist them with conversation simulations allowing them to practice their language skills in a safe and non-judgmental environment helping them grow in confidence and become more fluent. Through text-based conversations mirroring real-life situations, learners - in particular those without the benefit of interacting with native speakers or language teachers - can practice speaking and listening.

ChatGPT can provide them with writing exercises that focus on developing their fluency. For example, in writing exercises learners may be prompted to write in a specific style or on a particular topic. These exercises can help them to develop their writing skills and improve their fluency through opportunities to practice writing in different contexts.

Furthermore, ChatGPT can give learners personalized feedback on their speaking and writing skills, helping them to identify areas for improvement and providing targeted exercises to help develop their fluency. This can be particularly beneficial for those who may not have access to native speakers or language teachers who can provide this level of personalized feedback.

In addition to providing interactive and engaging exercises, ChatGPT can also help develop fluency by giving learners opportunities for repetition and reinforcement through a range of exercises. For example, some may focus on repeating phrases or sentences until learners can say them fluently and accurately.

4.4. Motivation of ChatGPT on accuracy

Accuracy is essential for effective communication and avoiding misunderstandings. Responses show that ChatGPT has the potential to significantly influence learners' accuracy when studying a foreign language by providing immediate feedback on their language usage.

Interviewees, in the research study, were impressed by the way ChatGPT helps develop accuracy through identifying grammatical errors or incorrect vocabulary usage and providing targeted feedback to help learners improve. It can analyze language input and identify areas where learners may be struggling with accuracy, and give examples of correct language usage; it generates text examples to illustrate correct grammar or

vocabulary usage; and allows learners to compare their own language usage to that of a native speaker, helping them make improvements and adjustments accordingly.

The lecturers and students interviewed for the study felt confident that ChatGPT can provide learners with personalized exercises that focus on developing their accuracy in a targeted and efficient way. It may provide exercises asking learners to identify and correct grammatical errors, or others focused on developing vocabulary usage.

ChatGPT can provide a safe and non-judgmental environment for learners to practice their language skills, allowing them to experiment with different language usage and receive feedback without fear of making mistakes or criticism. This can help them to feel more comfortable and confident using the language, which can lead to better accuracy in real-life situations.

5. Discussion

Motivation may play a big part in teaching and learning a foreign language with the help of ChatGPT. *First*, it can be fine-tuned or customized to better suit the Vietnamese context, and learners' needs and preferences. This can be done through collaboration between language experts, AI developers, and teachers and learners themselves. *Second*, ChatGPT can be accompanied by other language teaching approaches and materials, such as textbooks, videos, and real-life interactions, leading to a balanced and diversified learning experience catering to different learning styles and needs (Stutz, 2023). *Third*, ChatGPT can be integrated in a responsible and ethical way that respects learners' privacy and autonomy. This can be done through transparent and informed consent procedures, data encryption, and secure storage and deletion of data. Teachers and learners can also be educated on ChatGPT's risks and benefits and how to use it safely and responsibly (Nisar, 2023; Susnjak, 2022).

5.1. Benefits of applying ChatGPT to foreign language learning

One of the primary benefits of ChatGPT is that it can motivate learners through personalized learning experiences. Thorough interacting with learners, ChatGPT can analyze their responses and tailor feedback to individual needs. This can help learners focus on areas requiring the most improvement, rather than following a one size fits all approach. For example, ChatGPT can identify specific areas where a learner may struggle with pronunciation or grammar and provide targeted feedback to help them improve. ChatGPT can offer a judgement-free zone where learners can practice their language skills without fear of making mistakes or being criticized.

Another benefit of ChatGPT is that it can provide an engaging and interactive learning experience. Rather than simply reading a textbook or listening to a lecture, learners can interact with ChatGPT in a more conversational way. Learning then becomes more enjoyable and motivating, which can improve knowledge retention. Additionally, ChatGPT can provide immediate feedback on language usage, helping learners to correct mistakes and improve their skills quicker.

Students and lecturers felt that ChatGPT motivates students to bridge the gap between classroom learning and real-world language usage. While traditional language teaching methods may focus primarily on grammar and vocabulary, this particular chatbot can provide learners with opportunities to practice using the language in real-life situations. They can interact with ChatGPT in scenarios that simulate real-life conversations, such as ordering food at a restaurant or asking for directions. ChatGPT may motivate learners by providing them with access to language learning resources that may not otherwise be available to them. With the rise of online education, there is a growing market for self-paced language learning resources. ChatGPT can be used for creating interactive online language learning modules, allowing learners to practice speaking and writing in a foreign language at their own pace. These modules can be tailored to the specific needs of learners, providing personalized feedback and support.

Another motivational benefit of ChatGPT is that it can help to address a shortage of foreign language teachers in Vietnam. With a large population and a growing economy, the demand for teachers is rising but the country may lack enough suitably qualified foreign language teachers to meet demand. ChatGPT can be used to supplement traditional language teaching, allowing learners to interact with an AI tool and receive feedback without access to a human teacher. Exploiting the rise of mobile devices and the internet, ChatGPT can give access to language learning resources anytime, anywhere, through a mobile app or website, allowing learners easy interaction with the AI tool. This flexibility can be particularly beneficial for learners with busy schedules or limited access to language learning resources.

5.2. Negative effects of applying ChatGPT in teaching foreign languages

While ChatGPT has the potential to revolutionize foreign language learning, there are also potential negative effects to consider. Despite its advanced capabilities, ChatGPT has limitations in terms of accuracy and hence may have implications for a learner's language proficiency (Tlili, 2023; Szabo, 2023).

One of the most significant negative effects is the risk of language inaccuracies. While ChatGPT has been trained on a massive amount of data, it is nonetheless an artificial intelligence tool and mistakes can arise when generating text. This could mean learners receive incorrect feedback, which could harm their language learning progress. For

example, errors in pronunciation or grammar may not be accurately identified, leading learners to continue making the same mistakes.

ChatGPT may not be able to give learners feedback that is appropriate for their skill level, so it may negatively impact on their motivation for learning. As ChatGPT has been trained on a massive dataset, it may not be able to differentiate between learners who are at various levels of language proficiency. Hence, they may receive feedback that is too advanced or too basic, which could hinder their language development.

Another potential negative effect is the lack of personalization in ChatGPT's feedback. While it is capable of analyzing learners' responses and tailoring feedback to individual needs, it may not be able to provide the same personalized level of feedback as a human language teacher can. Language teachers can build a rapport with their students and provide feedback tailored to an individual's learning style; this may not be possible with an AI tool.

Furthermore, the use of ChatGPT may lead to a lack of cultural understanding. Language learning is not just about linguistic proficiency, but also about developing an understanding of the culture and context in which a particular language. While ChatGPT may be able to provide a basic understanding of the language, it may not be able to provide learners with a deep insight into the cultural nuances and context in which the language is used. This could mean learners develop a superficial understanding of the language and culture, which may not be sufficient for effective communication in real-life situations.

While it can provide an interactive and engaging learning experience, ChatGPT may not be able to offer the same level of motivation and engagement which human teachers can give. Learners may not be as invested in language learning if they are only interacting with an AI tool, which could hinder progress and development in their language skills. The lack of social interaction matters because language learning is not just about developing linguistic proficiency, but it is also about furthering social skills that allow learners to communicate effectively with native speakers of the language.

Moreover, the use of ChatGPT may perpetuate inequalities in language learning. While it has the potential to provide learners with access to language learning resources that may not otherwise be available to them, it may also exacerbate existing inequalities in this sphere. Learners without access to technology, or who are less technologically proficient, may not be able to benefit from ChatGPT. Additionally, ChatGPT's lack of cultural empathy may put those from marginalized communities at a disadvantage due its unintentional perpetration of stereotypes and bias.

6. Conclusion

Integrating ChatGPT in teaching foreign languages in Vietnam from the perspective of innovative pedagogy can offer a promising approach to enhancing learners' language

proficiency, motivation, and creativity. By providing personalized and interactive learning experiences that simulate real-life communication and foster autonomy and critical thinking, ChatGPT can contribute to the development of an innovative and sustainable education system that prepares learners for challenges and opportunities of the wider world. This AI tool also has potential motivation and challenges in the Vietnamese context, which need to be addressed through a collaborative and responsible approach involving language experts, AI developers, teachers, learners, and policymakers. The motivation of using ChatGPT in teaching and learning foreign languages in Vietnam may empower learners to achieve their full potential.

References

- de Winter, J.C.F. (March 2023). *Can ChatGPT pass high school exams on English language comprehension?* https://www.researchgate.net/publication/366659237_Can_ChatGPT_pass_high_school_exams_on_English_Language_Comprehension
- Geerling, W., Mateer, G.D., Wooten, J. & Damodaran, N. (2023). Is ChatGPT smarter than a student in principles of economics?. *SSRN*, (2).
- Gilson, A., Safranek, C.W., Huang, T., Socrates, V., Chi, L., Taylor, R.A. & Chartash, D. (2023). How does ChatGPT perform on the United States medical licensing examination? The implications of large language models for medical education and knowledge assessment. *JMIR Med. Educ*, (9).
- Han, Z., Battaglia, F., Udaiyar, A., Fooks, A. & Terlecky, S.R. (2023). An explorative assessment of ChatGPT as an aid in medical education: Use it with caution. *MedRxiv*. <https://doi.org/10.1101/2023.02.13.23285879>
- Hargreaves, S. (2023). Words are flowing out like endless rain into a paper cup’: ChatGPT & law school assessments. *SSRN*. <http://dx.doi.org/10.2139/ssrn.4359407>
- Hisan, U. & Amri, M. (2023). ChatGPT and medical education: A double-edged Sword. *JPES*, (2).
- Lo, C. K. (2023). What are the impacts of ChatGPT on education? A rapid review of literature. *Education Sciences*, 13(4). DOI:10.3390/educsci13040410
- Megahed, F.M., Chen, Y.J., Ferris, J.A.; Knoth, S. & Jones-Farmer, L.A. (2023). How generative AI models such as ChatGPT can be (Mis)Used in SPC practice, education, and research? An exploratory study. *arXiv*. arXiv:2302.10916
- Mhlanga, D. (2023). Open AI in education, the responsible and ethical use of ChatGPT towards lifelong learning. *SSRN*. DOI:10.2139/ssrn.4354422
- Minh Van Nguyen, Tuan Ngo Nguyen, Bonan Min & Thien Huu Nguyen. (2021). Crosslingual transfer learning for relation and event extraction via word category and class alignments. In *Proceedings of the 2021 Conference on Empirical Methods in Natural Language Processing*. Association for Computational Linguistics.
- Mogali, S.R. (2023). Initial impressions of ChatGPT for anatomy education. *Anat. Sci. Educ*. DOI: 10.1002/ase.2261
- Nisar, S. & Aslam, M. (2023). Is ChatGPT a good tool for T&CM students in studying pharmacology? *SSRN*. DOI:10.2139/ssrn.4324310

Sallam, M. (1 March 2023). The utility of ChatGPT as an example of large language models in healthcare education, research and practice: Systematic review on the future perspectives and potential limitations. <https://www.medrxiv.org/content/10.1101/2023.02.19.23286155v1>

Susnjak, T. (2022). ChatGPT: The end of online exam integrity? *ArXiv*. arXiv:2212.09292v1

Stutz, P., Elixhauser, M., Grubinger-Preiner, J., Linner, V., Reibersdorfer-Adelsberger, E., Traun, C., Wallentin, G., Whös, K. & Zuberbühler, T. (2023). Ch(e)atGPT? An anecdotal approach on the impact of ChatGPT on teaching and learning GIScience. *EdArXiv*. <https://doi.org/10.3390/educsci13040410>

Szabo, A. (2023). ChatGPT a breakthrough in science and education: Can it fail a test? *OSF Prepr*. DOI: 10.17605/OSF.IO/7CDMF

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).

Topsakal, O. & Topsakal, E. (2022). Framework for a foreign language teaching software for children utilizing AR, Voicebots and ChatGPT (large language models). *Journal of Cognitive System*, (7). DOI:10.52876/jcs.1227392

Viet Dac Lai, Amir Pouran Ben Veyseh, Minh Van Nguyen, Franck DERNONCOURT & Thien Huu Nguyen. (2022). MECI: A multilingual dataset for event causality identification. In *Proceedings of the 29th International Conference on Computational Linguistics*. International Committee on Computational Linguistics. Gyeongju. Republic of Korea. 2346-2356.

Willems, J. (2023). ChatGPT at universities - the least of our concerns. *SSRN*. <http://dx.doi.org/10.2139/ssrn.4334162>

Zhai, X. (2022). ChatGPT user experience: Implications for education. *SSRN*. <http://dx.doi.org/10.2139/ssrn.4312418>

Zhai, X. (2023). ChatGPT for next generation science learning. *SSRN*. <http://dx.doi.org/10.2139/ssrn.4331313>