
Using ChatGPT in Foreign Language Research: An Overview

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Abstract

Recent developments in Artificial Intelligence (AI) that are based on the large language model (LLM) may profoundly affect the foreign language research process. Under this perspective, a chatbot, ChatGPT, has become popular in mainstream education and foreign language teaching, learning, and research. On the other hand, whether and how ChatGPT can be used in foreign language research remains a considerable question that is unanswered in the broadest sense. This paper will provide an overview of using ChatGPT in foreign language research. For this purpose, the paper first introduces ChatGPT and then draws its chronological and pedagogical framework. Then, after introducing its features, the paper lists, and discusses the potential role in foreign language research. Finally, it presents basic information regarding its limitations and ethical issues.

Keywords: Artificial intelligence, ChatGPT, research on foreign language

Yabancı Dil Araştırmalarında ChatGPT Kullanımı: Genel Bir Bakış

Özet

Büyük dil modeline dayalı Yapay Zekâ konusundaki son gelişmelerin, yabancı dil araştırma sürecini derinden etkilemesi kaçınılmazdır. Bu perspektif altında, bir sohbet botu olan ChatGPT, sadece genel çerçevede değil, aynı zamanda yabancı dil öğretiminde, öğreniminde ve araştırmasında da popüler hale gelmiştir. Diğer yandan, ChatGPT'nin yabancı dil araştırmalarında nasıl ve neden kullanılabileceği, geniş bir bakış açısı ile yanıtlanmamış bir soru olarak karşımıza çıkmaktadır. Bu çalışma, ChatGPT'nin yabancı dil araştırmalarında kullanımına dair genel bir bakış sunmayı amaçlamaktadır. Bu amaca bağlı olarak, çalışma önce ChatGPT'yi tanıtmakta ve ardından kronolojik ve pedagojik arka planından bahsetmektedir. Ardından, ChatGPT'nin özelliklerini tanıtılmış ve yabancı dil araştırmalarındaki rolünden bahsedilmiştir. Son olarak, sınırlılıklar ve etik sorunlarla ilgili temel bilgiler sıralanmıştır.

Anahtar Sözcükler: Yapay Zekâ; ChatGPT; yabancı dil araştırmaları

1. Introduction

Research on foreign language learning and teaching is vital for several reasons. For instance, there is a strong necessity to understand the learning and acquisition process by analyzing learners' needs, evaluating teaching programs, and understanding the testing and evaluation processes (McDonough & McDonough, 1997). In this way, it is possible to follow recent innovations and developments regarding foreign language teaching and learning (Denkci Akkaş et al., 2022). Moreover, research in the foreign language context contributes to reflectivity and inquiry which will "promote and empower teaching through deeper exploration and critical reflection" (Dikilitaş & Bostancıoğlu, 2019, p. 9). In other words, research is beneficial to teachers and learners for developing flexibility and adaptability that requires awareness of their practices (Dikilitaş & Bostancıoğlu, 2019). In conclusion, research is vital for obtaining practical, transformative, and reflective knowledge (Nassaji, 2012), constructing links between theory and practice (Kumaravadivelu, 2003), and most importantly, development of teaching and learning skills (Griffie, 2012; Nassaji, 2012). For Nunan, research includes "a systematic process of inquiry consisting of three elements or components: a question, problem, or hypothesis, data, analysis, and interpretation of data". (1992, p. 3). In this systematic process, the researcher needs to use basic research skills, formulate research questions, review the related literature, design an appropriate methodology, choose data collection tools and data analysis techniques, prepare a report, and consider ethical issues (Dikilitaş & Bostancıoğlu, 2019). On the other hand, the mentioned processes may not be performed without considering the recent developments in information and communication technologies.

Today, the digital revolution directly affects foreign language research in several ways. First, it is now easier to access published papers via the Internet for compiling and synthesizing previous studies to communicate and collaborate with other researchers in electronic environments. Second, researchers use software for data collection and analysis for complex computations without human error at an increased speed instead of printing thousands of pages (Smith, 2013). Third, technology allows submitting and disseminating papers and checking citations in online environments. It is possible to extend the list regarding how technology contributes to research on foreign language teaching and learning. Beyond conventional technology, researchers now experience a new tool and environment, namely AI.

1.1. Artificial intelligence

AI combines linguistics and computer science in a multidisciplinary way, performing multitasks such as learning, adapting, and understanding knowledge. Moreover, it can reactivate the current knowledge and use creative language that can be produced by human intelligence (Korteling et al., 2021; Sarker, 2022). Its history is traced back to a paper written by Turing (1950) on artificial intelligence. In this seminal paper, he asked the question, “Can machines think?” and defined the terms *machine* and *think*. Then, Arf (1959) presented machine design examples that are capable of thinking and drew attention to the similarities between the human brain and machines that have the ability to perform analytic and logical operations. In 1955, a project titled the Dartmouth Summer Research Project on AI was introduced (McCarthy et al., 2006). This proposal suggested that “every aspect of learning or any other future of intelligence can in principle be so precisely described that a machine can be made to simulate” (McCarthy et al., 2006, p. 13). This vision resulted in the development of machine learning algorithms that allow predictions and decision-making that depend on large datasets (Jordan & Mitchell, 2015).

1.2. ChatGPT

The chatbot called ChatGPT, based on large language model (LLM), was developed by OpenAI and released in 2022. It depends on massive text datasets in various human languages and is trained to generate texts similar to the text produced by humans with the ability to generate human-like responses from corpora consisting of websites on the Internet. ChatGPT, as a chatbot that can understand and generate responses in a text-based interface, is based on the Generative Pre-trained Transformer architecture that uses a neural network to process natural language and generates responses in accordance with the context of the input. In other words, ChatGPT is a machine-learning system that autonomously obtains and produces sophisticated information. Under this perspective can be seen as the first model that communicates in human languages on various topics (OpenAI, 2023).

On the other hand, technology, an inseparable part of education, literacy, and cognition today, may bring unpredictable results. Metaphorically speaking, it is possible to draw attention to the similarity between the invention of the printing machine and the appearance of ChatGPT. The invention of the printing press fostered the creation of knowledge rather than copying (Saenger, 1997). Nevertheless, there was resistance to the printing machine, similar to the resistance by educators and researchers to the transformative effect of technology on communication and basic language skills (Cuban, 1986) and specifically research skills, while the appearance of digital transformed the production of knowledge (Harnad, 2003). For instance, it was noted that misinformed use of technology would harm human value in education (Postman, 1993), while it was stated that technology may solve all educational problems (Negroponte, 2006). While a profound debate has continued, educators changed their minds when they recognized the invaluable effects of technology on learning and teaching and internalized its utilization (Warschauer, 1998). Yet, we still do not know what unpredictable results to education, foreign language learning, and research will be faced due to ChatGPT. Not surprisingly, this process may result in a new *silent reading* process. Below, the potential of ChatGPT for research on foreign languages, and ethical issues are presented.

2. ChatGPT and research on foreign language

After the rapid and dramatic changes in generative AI in recent years, ChatGPT has now been considered as an efficient, strong, and competitive tool and environment in the educational and research context due to several characteristics (Grimaldi & Ehrler, 2023). First, *intelligence*, the ability to understand and articulate the understanding, is a characteristic since ChatGPT can understand the input as a text and respond to it like a human being. It can process the information in a context within rationalization and reasoning (Gilson et al., 2023). For instance, the researcher can use ChatGPT to rationalize a research issue based on reasoning, as shown in Figure 1.

Can you provide research topics on speaking motivation and artificial intelligence? However, I need a strong background, rationalization and reasoning.

Certainly! Here are some research topics that combine speaking motivation and artificial intelligence, along with background information, rationalization, and reasoning for each:

1. **AI-Powered Personalized Language Learning Assistants for Speaking Motivation**

Background: Language learning is often challenging, and motivation to speak and practice is a crucial factor in achieving fluency. Artificial intelligence has the potential to create personalized language learning assistants that adapt to individual learners.

Rationalization: By integrating AI algorithms that analyze learner preferences, performance, and progress, personalized language learning assistants can provide tailored exercises, feedback, and rewards, thereby enhancing speaking motivation.

Reasoning: This research could investigate the development of AI-driven language learning platforms that employ motivational strategies, such as gamification, social interaction, and real-world applications to encourage speaking practice.

Figure 1. Sample research topic

Second, *versatility*, the ability to adapt different functions, allows ChatGPT to generate texts in a wide variety of issues from general to specific in various human and computer languages. For instance, it can write and edit documents, formulate questions, and provide discussion points on different topics (Dowling & Lucey, 2023), as indicated in Figure 2.

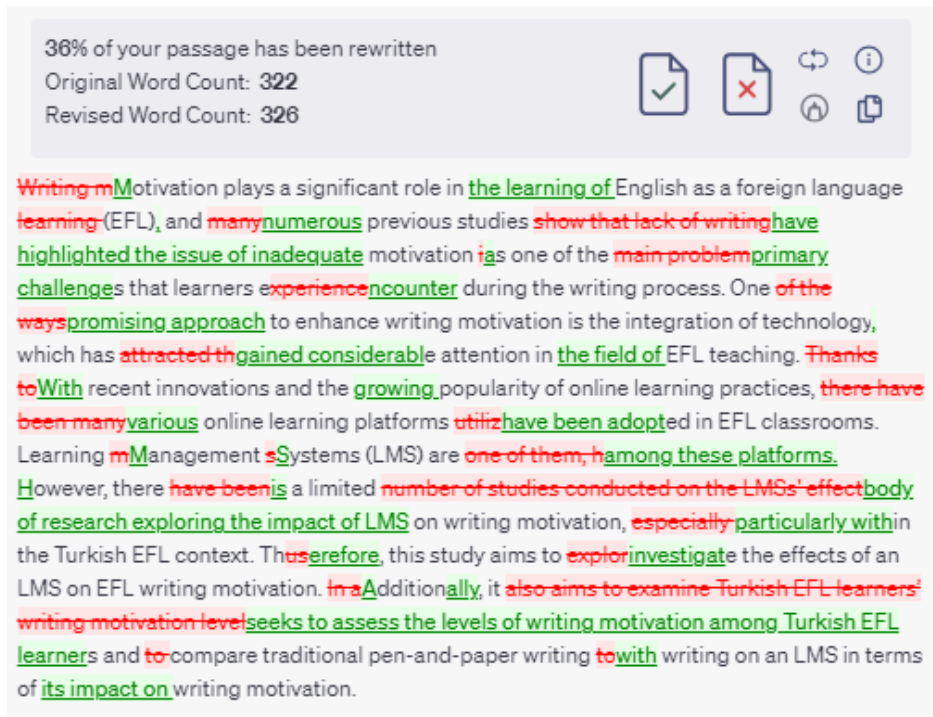


Figure 2. A sample of proofreading

Third, *collaboration*, the act of working with others to share and produce knowledge, is the characteristic that includes conversational capacity within reinforcement from feedback. In this way, ChatGPT plays the role of collaborator by listening and responding depending on human feedback. The opportunities are endless in terms of writing, rewriting, proofreading, and editing (Lin, 2023), as indicated in the following figure.

Clarity and Flow: The revised text is clearer and flows well. It effectively conveys the research context, objectives, methods, and findings.

Consistency: The text maintains consistency in terminology, referring to EFL (English as a foreign language) and LMS (Learning Management Systems) throughout. This consistency aids in clarity and understanding.

Detailed Explanation: The text provides a detailed explanation of the research objectives, methods, and findings, making it informative and comprehensive.

Grammar and Syntax: The text is well-structured with correct grammar and syntax, which enhances readability.

Data Presentation: The description of data collection, groups, and data analysis is clear and concise, providing a good overview of the research methodology.

Findings Interpretation: The interpretation of the findings is balanced and informative, including the recognition of trends in the experimental group's motivation levels.

Figure 3. Sample text after feedback

While ChatGPT, a sample of the new generation of search engines (Grant & Metz, 2022), can produce informative responses to complex questions since it has increased the size and quality of data in sophisticated methods in calibrating with human feedback, it is not without limitations. First, since it is a language model, it may not understand the content as humans can. Thus, responses are confined to the predictions learned by training. In other words, if there is no strong context, what it produces may remain contradictory.

Research Question: "Does a correlation exist between the frequency of ice cream consumption and foreign language anxiety levels among language learners, and if so, what might be the underlying factors contributing to this relationship?"

Figure 4. An out-of-context research question

Second, ChatGPT may fabricate facts depending on false but confident statements and common sense productions. Thus, the reliability and accuracy of the responses produced may be critical (van Dis et al., 2023) since it tend to create assumptions based on user-intended information (Shen et al., 2023). Furthermore, it may introduce inaccurate information, plagiarism, and bias and produce false and misleading texts, as shown in the figure below.

1. All people are motivated by the same factors.
2. External rewards are the primary motivators.
3. Motivation is static.
4. Motivation is the only factor influencing language learning.
5. Fear or anxiety can't be motivating.

Figure 5. Samples for misconceptions about foreign language learning motivation

Moreover, it can fabricate responses that contain wrong data, factual errors, and misrepresentations. Thus, while ChatGPT produces convincing but wrong texts, it should be noted that the information obtained via ChatGPT may distort scientific findings and cause misinformation (van Dis et al., 2023), as indicated in Figure 6.

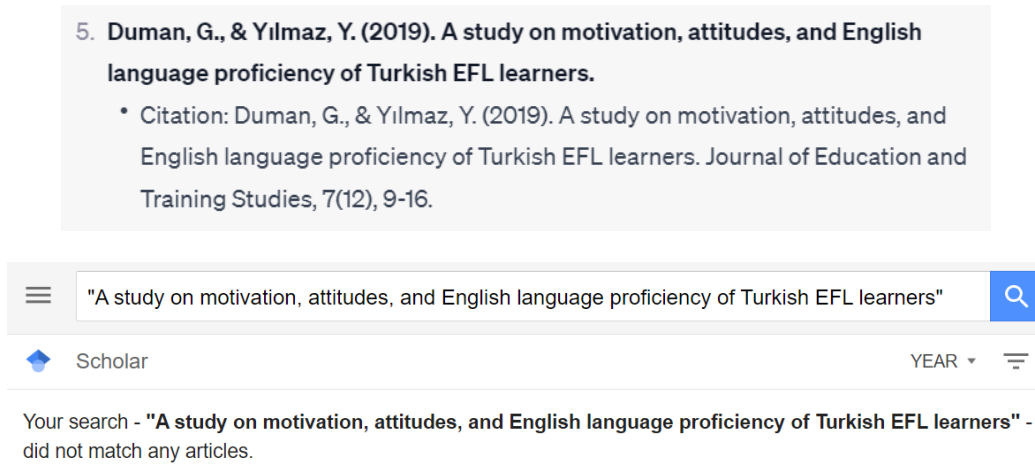


Figure 6. Sample of fabricated information

In other words, while ChatGPT can fluently answer complex factual questions in structured language genres, it can give wrong answers (Katwala, 2022), and generate responses displaying gender and racial biases stemming from the content of websites, books, articles, and other databases that constitutes its corpus.

2.1. Ethical issues

Some of the ethical issues regarding the use of ChatGPT may arise in terms of copyright, authorship, manipulation, plagiarism, and fabrication (Lin, 2023). For instance, copying a text from ChatGPT to a scientific paper does not seem appropriate since it not only forces the limits of copyright issues but also is regarded as plagiarism (Grimaldi & Ehrler, 2023), as several samples that are listed in Google Scholar are provided below.

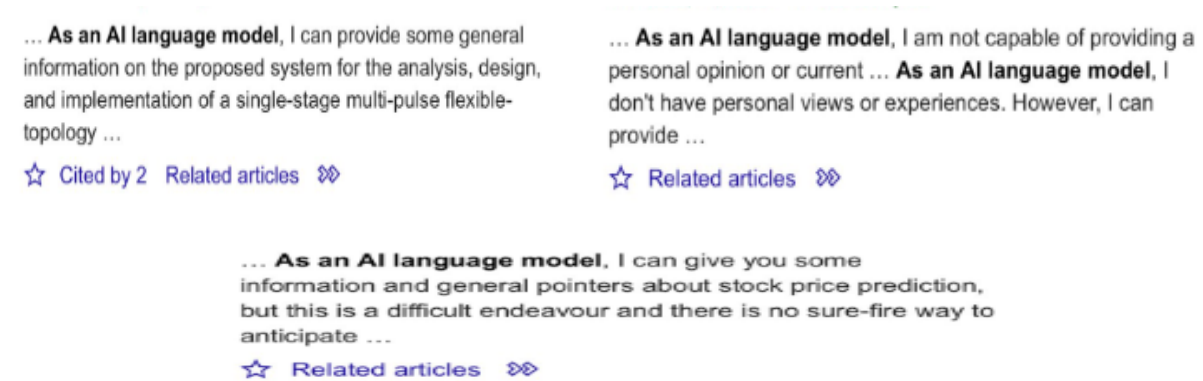


Figure 7. Article texts obtained from ChatGPT

AI-supported papers may also include fake research results and fraudulent data (Shen et al., 2023). Under this perspective, *Springer* does not allow large language models as authors listed in scientific papers (Nature, 2023). Similarly, *Science* does not accept papers that include AI tools as authors and AI-produced content (Thorp, 2023).

3. Concluding remarks

Research on foreign language teaching and learning is vital since it is necessary to understand the learning and acquisition process from the perspective of recent innovations and developments. In this way, obtaining practical, transformative, and reflective knowledge will be possible, creating links between theory and practice and ultimately developing foreign language learning and teaching. It is also evident that the foreign language research process cannot be performed without digital tools and environments that present considerable opportunities. At this stage, foreign language researchers should be aware that ChatGPT provides great

opportunities in the research process since it is intelligent, versatile, and open to collaboration. On the other hand, it is not without limitations. For instance, it may not understand the content and context, fabricate statements, contain wrong data, factual errors, and misrepresentations. In addition, responses produced by ChatGPT may not be accurate and reliable. More dramatically, ChatGPT provides a source for manipulation, plagiarism, and fabrication among individuals who are not aware of research ethics. The final point is that the use of ChatGPT is inevitable and cannot be banned. Thus, foreign language researchers need to engage in this technology in the research processes, while they need to be aware of certain aspects of its utilization regarding human verification, accountability, and ethical issues.

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Note on Ethical Issues

The author confirms that the study does not need ethics committee approval according to the research integrity rules in his country (Date of Confirmation: 20/09/2023).

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