

# The impact of ChatGPT on foreign language teaching and learning: Opportunities in education and research

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**Abstract:** The revolutionary online application ChatGPT has brought immense concerns to the education field. Foreign language teachers being some of those most reliant on writing assessments were among the most anxious, exacerbated by the extensive media coverage about the much-fantasized functionality of the chatbot. Hence, the article starts by elucidating the mechanisms, functions and common misconceptions about ChatGPT. Issues and risks associated with its usage are discussed, followed by an in-depth discussion of how the chatbot can be harnessed by learners and teachers. It is argued that ChatGPT offers major opportunities for teachers and education institutes to improve second/foreign language teaching and assessments, which similarly provided researchers with an array of research opportunities, especially towards a more personalized learning experience.

**Keywords:** Large Language Model, second language education, flip classroom, personalized learning, formative assessment

## Introduction

In the fast-paced world of technology, it is rare for a new development to make waves as quickly as ChatGPT has. In less than four months, this Artificial Intelligent (AI)-powered language model has taken the world by storm, with everyone from researchers to casual internet users buzzing about its capabilities. While the tech-savvy celebrate its incredible functionality, the education field has stood in both amazement and apprehension. There is extensive media coverage of cases of cheating and misconduct (Muskat, 2023; Peritz, 2022). Following the worries over the use and misuse of ChatGPT, education institutes one after another have announced bans on the use of the months-old chatbot (Reuters, 2023). Teachers and school administrators see ChatGPT as opening Pandora's box, posing threats to students' development of critical thinking and writing abilities.

However, as we examine the history of technological advancement, there has never been a lack of concerns from educators over the use of new technologies, from assertions such as Google search engines slowing down cognitive processes, making people stupid (Carr, 2008), to worries about students' reliance on the "untrustworthy" source of information on Wikipedia (Meishar-Tal, 2015), to how smartphones crippled students' inability to write complete sentences (Strain-Moritz, 2016). While it is typical that early research pertaining to new technologies is overwhelmingly negative (Kahn, 2011), time and again history tells rather positive stories about each technological innovation (Kaufman & McNay, 2017). Psychologists have attributed the misalignment of anticipation and reality to human beings' natural tendency to envision the unknown as "the enemy" (Karlín, 2013, p. 217), or that individuals and organizations are simply reluctant to accept major changes, widely known as the "innovator's dilemma" (Christensen, 2011, p. ix). This is not to say that educators' concerns are not legitimate—they often are (Alhumaid, 2019). However, being pre-maturely anxious about the new wave may result in the oblivion of the new opportunities and mentality engendered by it.

In second or foreign language (SL/FL) teaching and learning, specifically, anecdotal evidence suggests teachers are most concerned about unoriginal writing that cannot be duly detected by any existing applications (Molly, 2022). This aligns with the observation at my own teaching institute, where English writing is a core course component, and that faculty unanimously object to students' use of ChatGPT. However, to understand the full picture of the threats and opportunities, a correct understanding of the new technology is fundamental. Admittedly, ChatGPT is a game-changer that will, and should, change the much-stagnated teaching and assessment approaches in higher education. The changes may

call for research efforts to understand and address the needs of various stakeholders of language education.

### **ChatGPT: What it is and is not**

ChatGPT is a state-of-the-art chatbot based on OpenAI's Generative Pre-trained Transformer-3 (GPT-3) family of large language models and has been fine-tuned using both supervised and reinforcement learning techniques (Radford et al., 2018). Supervised fine-tuning refers to the training using specific labelled datasets (Lee et al., 2018), while reinforcement learning is a technique for the machine to interact with the environment to maximize rewards while exploring different possibilities autonomously (Verma & Diamantidis, 2021). ChatGPT can engage in dialogues with users in a natural and responsive way (King & ChatGPT, 2023). The neural network of the language model, which draws from large datasets to form varied strengths of connections, ensures ChatGPT can produce text responses that are similar to human language (MacNeil et al., 2022), answer follow-up questions, admit its mistakes, challenge incorrect premises, and reject inappropriate requests. Further, ChatGPT can generate text in various forms, such as essays, jokes and poetry. With continuous input from users, ChatGPT is able to improve its performance in similar tasks (e.g., answering similar questions).

To put simply, unlike popular and often romanticized beliefs, ChatGPT does not respond to users' questions by means of reasoning, nor does it respond with emotions, but it compares existing data to draw the most likely (e.g., the most frequent and relevant) responses. Hence, the feedback from the end-user is vital to its subsequent accuracy. Owing to its underpinning mechanism, ChatGPT is not able to "understand" the text it generates or the context of the information, which often results in "plausible-sounding but incorrect or nonsensical answers" (Thorp, 2023, p. 313). Already researchers and news media alike have reported concerns over the accuracy of the information

provided by ChatGPT (van Dis et al., 2023; Graham, 2022), with cases suggesting ChatGPT made up content in face of knowledge gaps and even fabricated bogus sources (King & ChatGPT, 2023; Rudolph et al., 2023). Scholars have pointed out that despite their seemingly powerful synthesis ability, “chatbots merely learn statistical associations between words... rather than understand their meanings” (van Dis et al., 2023, p. 615). Hence, in more precise terms, ChatGPT is a cutting-edge text-generating search engine that does not crawl the web for up-to-date information (Rudolph et al., 2023), but is good at mimicking human interactions (Azaria, 2022) and excels in filtering out unnecessary information to offer what the user requests. It goes beyond doubt that it is a very powerful search tool, but that is mostly about it, which should remind us of the same awe that we experienced when we first used Google search or Google scholar. The widespread insecurity comes largely from an inadequate understanding of the technology, resulting in fear of the unknown (Carleton, 2016; McNaught, 1995).

At this stage, texts written by a large-language-model chatbot are not hard to spot (Graham, 2022; van Dis et al., 2023), as the way of writing comes with a certain pattern and available online applications can effectively identify them (van Dis et al., 2023). The leading plagiarism-detection application, Turn-it-in, is also working on including AI-writing detection in its system, which it stated can be in full capacity in 2023 (Chia, 2023). For teacher inspection, the content of AI-writing is typically shallow, and at times comes with false facts and made-up references (Rudolph et al., 2023). Thus, it should not be easy for an AI-generated essay to pass the scrutiny of a teacher who reads it with care. That being said, the potential of the successor—GPT4—is harder to estimate, with preliminary evidence suggesting it can imitate human thinking in an almost perfect way (Adesso, 2023). It is this speculated level of capability that has brought

much ethical concerns over the use of the next-in-line GPT4 (Rudolph et al., 2023). According to Business Insider (2023), the Chief Executive Officer of OpenAI Sam Altman assured that the next generation of GPT would not be released until they figured out ways for it to be used safely and responsibly. Until then, second/foreign language educators still have a little time to work out the ethical and responsible application of chatbots and discuss their benefits, problems and risks with students, which is a much better strategy than to completely avoid the topic.

### **The Big Disruptor**

ChatGPT is not only a big disruptor to the industry (Grant & Metz, 2022), as many recognizes, but it is also an immense disruptor of the education field. However, disruptors are necessary to cause substantial changes in the obdurate education system. Ferster (2014) once hypothesized if a ninetieth-century student were to study in a current classroom, he/she would feel surprisingly comfortable. Unfortunately, much of it still remains true in SL/FL classrooms to this day.

Therefore, it can be argued that the education field needs a game-changer more than any other professional arena. As an example, prior to COVID, most educators never imagined having the need to convene classes online, even less likely to prefer it (Bunk et al., 2015). Although teachers did feel uncomfortable conducting online classes at the beginning of the pandemic (Le et al., 2022), it was not long before people started discussing the advantages and benefits of online teaching and blended learning (Kim et al., 2022). It was also beyond researchers' imagination that the long-anticipated education reform led by Massive Open Online Courses (MOOCs) (Rudolph, 2014) happened over a fortnight due to an outbreak of a virus (Impey & Formanek, 2021), with long-lasting influence (Amit et al., 2022; Bettiol, 2022).

Of course, this is not to say that a new teaching approach is necessarily more effective than an older one. Each mainstream method is no doubt effective in its own historical setting. However, with advancement in technology and society comes changes in learner mentality, which necessitates new learner needs. Specific to SL/FL education, flip classroom has been widely and passionately discussed since its inception two and a half decades ago (Lage et al., 2000). However, practitioners are often slow or hesitant to adopt the method (Srvat & Pathranarakul, 2022), despite mounting evidence for its benefits (Turan & Akdag-Cimen, 2020), such as meeting current learners' needs and preferences.

Like it or not, chatbot technology will only become more popular among students than it already is. Therefore, SL/FL teachers should take the disruption as an opportunity to make substantial improvements in teaching and learning effectiveness, as will be expounded on in the following section.

### **Benefits and Opportunities**

ChatGPT offers an array of benefits and opportunities in education. Rudolph et al. (2023) suggested that learners can benefit from experiential learning as ChatGPT can generate different problem-solving scenarios. Students can also receive personal tutoring from ChatGPT. For teachers, AI-marking may free them from their heavy marking-load, allowing them to spend more time on lesson planning. Specific for learners, ChatGPT offers some major benefits.

#### *Authentic language use*

In many EFL settings, there are not many chances to use the target language aside from the classroom. In places that are very much exam-driven, such as Macao (Hong, 2021a), learners are only given artificial language practices that do not correspond to the daily usage of the FL. As ChatGPT excels in mimicking human interactions, learners can easily

initiate authentic conversations with the chatbot. A positive aspect of this is the learners usually have a real query in their mind, such as looking for ideas for a project. Hence, all the elements that are necessary in an authentic conversation—summarising thoughts, asking follow-up questions, making clarifications, offering information, etc.—will be present. Learners get to practise multiple aspects of language use, unlike in most classroom practices. On this very day as I am finalising this article, a new language learning application called “Speak” (<https://www.usespeak.com/>), which harnesses the technology of OpenAI, is released. The app is able to provide learners with (oral) conversational experience that is indistinguishable from speaking to a native speaker. Similar applications may raise learners' awareness of FL pronunciation and phonology, an area often overlooked in FL learning (Hong, 2015, 2016).

#### *Personal language tutor*

Similar to the points above, ChatGPT can generate topics for discussion and creative writing prompts for students to write creatively (TESOL International association, 2023). More importantly, ChatGPT excels in integrating the vast array of learning materials and resources for users. Many of the platforms or applications already being used by learners, such as Grammarly, Wikipedia, Google translate, Quillbot, etc., are adopted in combination by ChatGPT. Hence, it is able to pinpoint language and organizational issues in students' writing, offer writing ideas and suggest corrections (Ohio University, 2023). It can also explain the use of vocabulary in great details and offer examples. Best of all, the feedback is instant, unlike teacher feedback, which understandably takes time (Hong, 2021b), and by the time students receive their feedback, they might have completely forgotten everything from the previous writing. All in all, ChatGPT is a free and more efficient alternative to human tutors.

With ChatGPT being inevitable, teachers and education institutes should take it as an opportunity to innovate the century-old methods of teaching and assessment. First, SL/FL teachers should reduce take-home writing assignments, which they should already be doing because tools that are long available in the market, such as Google translate and Quillbot, have undermined the validity and integrity of many of these assignments. Should take-home assignments be necessary, teachers can choose tasks that cannot be easily assisted by AI-chatbots, such as writing daily journal entries, summarizing the content of a lecture, or other “conversion” type of writing tasks. For example, I used to ask students to convert a short clip of “Mr Bean” (A British sitcom that contains very little conversation) to a written story. These are tasks in which ChatGPT is unlikely to “ghost-write” for the students.

However, for high-stake writing assessments, in-class pen-and-paper writing is perhaps the best option. Alternatively, a writing task can just be a part of the larger assignment that involves other components, such as collective writing, presentations, and recording of audios and videos. Not only should the application of technology not be discouraged, but the integration of technology in assignments is necessary as it is how students would most likely apply the language in real life.

Further to teaching methods, it is high time for flip classrooms to be widely implemented in language classes. In a typical flipped classroom, students watch instructional videos outside the classroom and do assignments or engage in activities inside the classroom (Turan & Akdag-Cimen, 2020). A flipped classroom allows for increased interaction between teachers and students, promoting student-centred learning and improving the quality of classroom time. This approach provides students with a more active role in their own learning process, leading to increased motivation and engagement. Further, by allowing

students to learn foundational concepts outside of class, flipped classrooms allow for more hands-on, collaborative activities during class time that deepen understanding of subject matter (Chilingaryan & Zvereva, 2017). Finally, the flipped classroom can improve teaching effectiveness and student performance and achievement by providing more opportunities for practice and application of language skills, especially in speaking and writing.

With all the above changes, the education system may see a big opportunity to shift from the over-reliance on summative assessments to including more formative assessments (Dixson & Worrell, 2016). It is increasingly becoming apparent that formative assessments can better improve students’ learning than high-stake summative testing, the latter of which teachers are so used to providing.

### **Research agenda**

While ChatGPT opens up many opportunities to substantial changes in teaching and learning, many of the effects are yet to be investigated. Here are some of the major areas that await researchers’ exploration:

#### *ChatGPT as a tool for learning*

Researchers can explore the experience and perceptions of language learners utilising the application for language learning purposes. While I depicted above a rather positive picture of students chatting happily with chatbots, language learners at different levels of language proficiency may perceive and benefit very differently from using ChatGPT. As well, learners may have varied degrees of acceptance towards the new technology and new method of learning. Second, the effect of chatting with ChatGPT on learners’ acquisition of the four skills (speaking, listening, reading and writing), improvements in grammar accuracy, increase in vocabulary size, including formulaic sequence (Hong, 2015), changes in learner motivation (e.g., affective

filter, Krashen, 1985), language-using confidence and language aptitudes (Skehan, 2013), etc. are worthy of investigation.

ChatGPT may prove to be a big step forward for personalized learning (PL) and personal learning environments (PLEs), which have often been criticized for failing to tailor content according to the needs of particular individuals (Xu et al., 2023). One of the main reasons is that PL and PLEs need to be based on large data and students' feedback. However, many existing platforms simply do not have such functionalities, making them not much different from any typical online learning platforms. Chatbots, on the other hand, are strong at both, with gigantic data sources and constant learner feedback. Hence, researchers can look into how chatbots will impact PL and PLEs.

#### *ChatGPT to support teaching*

ChatGPT is able to mark student writing, offer suggestions, create lesson plans, generate tasks, questions, scenarios, etc (Rudolph et al., 2023). Hence, researchers can investigate teachers' perception of ChatGPT as a teaching tool, the potential of using it to alleviate teacher workload and how teachers are harnessing the platform. More importantly, the underlying issues with ethics and teacher professionalism associated with such usage should warrant in-depth discussion and research. For example, as ChatGPT draws information from existing sources without considering copyrights, is it ethical for teachers to use the lesson plans and materials produced by ChatGPT? What are the implications to other stakeholders such as the education institute and materials developers?

#### *Other emerging language teaching topics*

Other potential research topics include: i) the

development of ChatGPT and its integration in classroom teaching, ii) the impacts of ChatGPT on current teaching methods, such as task-based learning and teaching and flip classroom, iii) changes in methods of assessment to ensure assessment validity, iv) its effect on the learning gaps between students at different levels of proficiency and/or from different social backgrounds, etc. As the technology matures, it can be anticipated that novel investigations will arise pertaining to the capacity of the technology and its impact.

#### **Conclusion**

This article expounds on the functions of and misconceptions towards the much-discussed ChatGPT. In spite of its extremely powerful capabilities, ChatGPT is far from the cognition and language production of human beings as we know them. Teachers are encouraged to discuss the functions and working mechanism of the chatbot, as well as the limitations and problems associated with its usage. These are the bases for establishing ground rules for using the application. Banning the application is certainly possible on campus, at least for the moment. However, there is no easy way to prevent students from using the chatbot outside the campus. Instead, teachers and education institutes are encouraged to change their mentality to adapt teaching and assessments in consideration of the inevitable technology. It is my strong belief that, after the initial wave of apprehension, teachers will begin to see the bright side of the changes, so that they can fully embrace the benefits and opportunities brought by new technology. Similarly, for researchers, ChatGPT has opened up an array of topics for investigation. The potential of chatbot technology for education and research is unbounded.

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