ChatGPT-Assisted Language Learning and Teaching: A Scoping Review of Research on ChatGPT Use in L2 Pedagogy and Education

Masoud Azadnia *

Abstract

ChatGPT-assisted language instruction is gathering irresistible momentum in today's fast-moving, AI-governed world of educational enterprises. The current scoping review article sought to analyze and synthesize the existing literature on the complementary use of ChatGPT in second/foreign language (L2/FL) education and pedagogy. Aligned with Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR), the study adopted a systematic approach to evidential data search and analysis. A total of 28 peer-reviewed articles retrieved from well-established databases, such as Scopus and Web of Science (WoS), were reviewed to map the scope and consequences of the growing body of literature on using ChatGPT as an L2/FL learning/teaching tool. Centering around five predetermined variables, including setting, design, focus area, objective, and concluding remarks, the content or thematic analysis results helped to shape a clear picture of the literature under review. The literature-derived evidential data also referred to the fruits of ChatGPT-assisted instruction under three distinct headings: learning outcomes, pedagogical outcomes, and cognitive-affective impetus for language learning and teaching. The review results also revealed the repercussions of the instruction mainly concerned with ethical and technical concerns. Given the immature but fast-paced nature of the literature on the instructional model, this early attempt, though provided a brief sketch of the research scope and chief outcomes of the model, needs to be complemented with future systematic reviews to fully unlock the potential of language pedagogy well suited to the demands of today's technology-governed education.

Keywords: Artificial Intelligence, ChatGPT, ChatGPT-assisted Language Learning, Scoping Review, Technology-aided Language Instruction

	Teaching English as a Second Language Quarterly (TESLQ) (Formerly Journal of Teaching Language Skills) 43(2), Spring 2024, pp. 49-85	**50** Masoud Azadnia

CHATGPT-ASSISTED LANGUAGE LEARNING AND TEACHING

The introduction of artificial intelligence (AI) and machine learning (ML) in the 1950s marked the dawn of a new era in the life of people living in the contemporary global village, institutionalizing the idea that human beings are inevitable to harness the predictive power of intelligent machines to keep pace and thrive in various aspects of modern life (Lund et al., 2023). Defined simply by McCarthy (2007) as an overarching discipline of creating intelligent machines, AI is concerned with designing computer systems capable of accomplishing human-like cognitive functions and intellectual activities, such as text/speech processing, simulating human acts/speech, and scientific/logical reasoning (Athanassopoulos et al., 2023). Thanks to the incredibly rapid growth in AI technology over the beginning decades of the recent century, various AI-powered technologies have been created and released to flourish digital citizens' lives (Buriak et al., 2023). AI-powered chatbots, categorized as computer applications capable of generating natural device-human conversations in text or voice form, are considered a core category of these brand-new technologies. As opposed to their rule-based traditional counterparts, which respond only to well-formulated inquiries previously programmed by the developer team based on predetermined data from external knowledge resources, AI-powered chatbots are enabled by advanced AI techniques, such as deep learning (DL), ML, and natural language processing (NLP), to forge an intelligent communication with their applicants. AI-powered chatbots process information extracted from massive datasets of textual data and respond based on the inquiries' mood and context (Jiang et al., 2022; Kohnke et al., 2023).

Coincident with the advent and proliferation of pre-trained generative AI systems targeted at creating various modes of innovative content (i.e., textual, audio, and video), many industries, such as communication, health care, and education, experienced a turning point in their way to growth (Kasneci et al., 2023; Lim et al., 2023). Notably, sophisticated systems and algorithms underlying the generative AI-powered chatbots acted as game-changers in the growing industry of education, promoting active, instant, and realistic human-device interactions; self-directed learning; personalized scaffolding; information accessibility; learning motivation; learner autonomy; real-time feedback; and flexible thinking (Chen et al. 2021; Kim et al., 2023). Chat Generative Pre-Trained Transformer (ChatGPT), one of the most recent breakthroughs in AI-powered technology, was launched by Open AI in November 2022 and took the lead in stimulating natural, human-like conversation and promoting personalized language learning (Bin Hadi et al., 2023). As an astonishing feature, this cutting-edge scientific discovery exploits user-supplied conversational cues and prompts to continuously enhance the

Teaching English as a Second Language Quarterly (TESLQ) (Formerly Journal of Teaching Language Skills)	**51**
43(2), Spring 2024, pp. 49-85	Masoud Azadnia

CHATGPT-ASSISTED LANGUAGE LEARNING AND TEACHING

output's contextual relevance and correctness (Nguyen, 2023). Prompts provided by ChatGPT's applicants can be redesigned iteratively to receive customized responses suited to various proficiency levels and rhetorical styles (Kostka & Toncelli, 2023).

ChatGPT rapidly acquired a reputation as a supplementary language learning path and, in turn, garnered second/foreign language (L2/FL) researchers and practitioners' attention engrossed in practical ways of technology-aided language pedagogy (Aljanabi et al., 2023; George & George, 2023; Kim et al., 2023; Kohnke et al., 2023; Rudolph et al., 2023), thanks to its numerous affordances, such as supporting a multiplicity of languages; spotting and analyzing writing's semantic, spelling, and structural errors; simulating high-stakes language examinations; providing user-directed gradually-modified output; facilitating authentic language use; offering rehearsal/practice opportunities; generating writing prompts; creating learning tasks/activities; providing immediate corrective feedback (CF); and creating a supportive and personalized learning environment. Along with myriad general and field-specific virtues exemplified above, mounting evidence of drawbacks and ethical concerns, such as the possibility of generating biased, untruthful, and misleading content (Aljanabi et al., 2023), differential performance in high-and low-resource languages (Jiao et al., 2023), and wholesale use of bot-generated academic content (Rudolph et al., 2023), has called for more investigation for proper ways of applying this recently-developed pre-trained large language model (LLM) in the L2/FL teaching/learning landscape.

The booming release of ChatGPT for public use yielded increasing interest in exploring how to exploit the potential of this fine-tuned AI-powered chatbot in reinforcing various educational enterprises. Not surprisingly, an abundance of research has been carried out over the approximately one-year history of ChatGPT use, focusing on its affordances and challenges/drawbacks (e.g., Jeon & Lee, 2023; Kasneci et al., 2023; Kohnke et al., 2023; Li et al., 2023; Tlili et al., 2023) in different educational contexts. As far as L2/FL learning is concerned, a growing body of research has been conducted to address learners (Liu, 2023; Liu & Ma, 2023; Xiao & Zhi, 2023), teachers (e.g., Ulla et al., 2023), and researcher' (e.g., Bin Hadi et al., 2023) perception of applying the tool in their formal/informal learning/teaching/research experiences. The attitudinal empirical evidence showed that most ChatGPT beneficiaries had favorable sentiments towards it and confirmed its usefulness for acting as either an informal language learning facilitator (Liu & Ma, 2023) or a formal language learning catalyst (Shaikh et al., 2023). There were also frequent attempts made to approach the potential advantages (e.g., George & George, 2023; Shaikh et al., 2023) and efficacy of ChatGPT in enhancing different skills (e.g.,

| Teaching English as a Second Language Quarterly (TESLQ) (Formerly Journal of Teaching Language Skills) 43(2), Spring 2024, pp. 49-85 | **52** Masoud Azadnia |

CHATGPT-ASSISTED LANGUAGE LEARNING AND TEACHING

Bin-Hady et al., 2023; Haggag, 2023) or affective constructs (Ali et al., 2023; Jillian et al., 2023) pertinent to language learning. Due to the textual modality of its input and output, the tool has been heavily used to foster language learners' writing skills (Haggag, 2023). Not surprisingly, the implications and affordances of ChatGPT for writing skills cultivation have become the focal center of researchers' attention and interest (e.g., Guo & Wang, 2023; Yan, 2023). Research also has addressed the potential virtues, risks, and limitations of using ChatGPT for FL/L2 learning and teaching (e.g., Hong, 2023). Some researchers also delved into the practical efficiency of instructional initiatives grounded on ChatGPT-assisted language learning, such as Kurikulum Merdeka Belajar (KMB) (Agustini, 2023; Dwivedi et al., 2023) and Revising an Essay with ChatGPT on an Interactive Platform with EFL learners (RECIPE) (Han et al., 2023). The results showed the positive contribution of these programs in several pedagogical and affective advances. Some other researchers approached the possibility of integrating Chat GPT into higher education courses (Baskara & Mukarto, 2023) and mainstream language teaching methods, such as Task-Based Language Learning (TBLT) (Kim et al., 2023).

Though primary research on ChatGPT-assisted L2 education and pedagogy is proliferating rapidly, secondary research on the issue still seems to fall short of the threshold for approving the conversational LLM's usefulness in various language learning contexts. Remarkable in quantity notwithstanding, the empirical evidence on using ChatGPT in different FL/L2 learning domains and contexts could hardly show avenues open to future researchers without synthesizing and scope mapping the growing body of research conducted over the recent year following the technology release. Although there is evidence for conducting secondary research on chatbot-supported L2 learning (e.g., Bibauw et al., 2022; Huang et al., 2022), showing several technical affordances and pedagogical benefits of this technology-aided language learning paradigm, only a few review attempts (Lo, 2023; Rudolph et al., 2023) have been made to elucidate the impact of using ChatGPT in educational initiatives. As testified by a detailed review of the existing literature, scant attention has been placed on mapping the scope of the growing literature on the contribution of ChatGPT to L2/FL education and pedagogy to determine more specific queries required to be addressed by a more precise systematic review. Such a substantial gap warrants a scoping review of the emerging evidence on the use of ChatGPT in different L2 teaching and learning initiatives. Scoping reviews, as defined by Munn et al. (2018), "are an ideal tool to determine the scope or coverage of a body of literature on a given topic and give a clear indication of the volume

Teaching English as a Second Language Quarterly (TESLQ) (Formerly Journal of Teaching Language Skills)	**53**
43(2), Spring 2024, pp. 49-85	Masoud Azadnia

CHATGPT-ASSISTED LANGUAGE LEARNING AND TEACHING

of literature and studies available as well as an overview (broad or detailed) of its focus" (p. 2).

The current scoping review article chiefly aimed at mapping the available evidential data on practicable ways of harnessing the power of ChatGPT in empowering L2/FL language learning and teaching skills to lay the foundations for future primary and secondary research on the field. The review sought to provide a clear picture of the methodological/contextual characteristics and concluding remarks of research on ChatGPT-assisted L2 education and pedagogy. The outcomes from this scoping review may open new research avenues to those interested in technology-aided L2 pedagogy, spotlighting the chief notions, pedagogical practices, and unexplored areas associated with ChatGPT-assisted L2 learning and teaching. The findings might also offer several tentative research areas for researchers and practitioners interested in exploiting the full potential of ChatGPT to cater to L2 learners and teachers, pinpointing the gap between the potential and practical consequences of such a technology-aided language instruction. The following research questions guided the present review research.

1. What are the scope and outcomes of research on using ChatGPT as a learning tool in L2/FL education and pedagogy?

Method

The methodology of the current research review, aligned with PRISMA-ScR requirements proposed by Tricco et al. (2018), entailed several successive steps, including developing a priori protocol, determining the information sources, selecting the review sample based on the eligibility criteria, searching (screening) the sample, charting and analyzing the data, and synthesizing the results.

Priori Protocol Development

The current scoping review aimed to search, summarize, and synthesize the recently developed literature on the use of ChatGPT in L2/FL learning and teaching to unlock how the full potential of this cutting-edge chatbot in improving mainstream language education and pedagogy has been addressed by research. As an initial step towards this primary aim, a priori protocol was formulated to transparently predefine objectives, procedures, and reporting strategies for searching the literature, retrieving the sample, and synthesizing the data. The protocol helped to follow a methodical approach to review and counter the reporting bias.

	Teaching English as a Second Language Quarterly (TESLQ) (Formerly Journal of Teaching Language Skills)	**54**
TESL Quarterly	43(2), Spring 2024, pp. 49-85	**Masoud Azadnia**

CHATGPT-ASSISTED LANGUAGE LEARNING AND TEACHING

Review Sample Selection and Screening

Despite the brief history of ChatGPT, scholarly attempts to address its affordances and effectiveness in L2/FL language education have raised rapidly; therefore, a growing body of literature constituted the sampling population in the current study. The databases searched to retrieve relevant academic research included Scopus, Web of Science (WoS), and Science Direct. The rationale for selecting the databases was their widely accepted credibility and comprehensiveness in the search field, as declared by many review articles on technology-assisted language education and pedagogy (e.g., Han et al., 2023; Huang et al., 2022; Imran & Almusharraf, 2023; Lo, 2023). According to PRISMA-ScR, the search process of scoping reviews should concentrate on a predetermined population, concept, and context (PCC). Hence, the search process entailed selecting peer-reviewed original and review research articles (participant) on ChatGPT-assisted education and pedagogy (concept) in the L2/FL learning/teaching field (context). Peer-reviewed articles were preferred to other strands of literature since they represent the highest quality strand of research reports (Korpershoek et al., 2016). The strings used to retrieve the research sample were subjected to the search systems provided by the databases. The three databases searched the requested articles using Boolean operators (i.e., OR and AND). Table 1 displays the search strings and filters used to retrieve the requested articles.

Table 1.

Keywords Used to Select the Article Corpus

Database	Search Strings	Filters
Scopus	chatgpt OR chatgpt- OR chat generative pre-trained transformer AND language learning OR language education OR language teaching OR language pedagogy AND L2/FL language learning OR L2/FL language education OR L2/FL language teaching OR L2/FL language pedagogy	Search within Title, Abstract, Keywords Language: English Subject Area: Social Science Document Type: Article Source Type: Journal Publication Stage: Final
WoS	"chatgpt AND language AND learning" OR "chatgpt AND language AND education" OR "chatgpt AND language AND teaching" OR "chatgpt- AND language AND learning" OR "chatgpt- AND language AND teaching" OR "chatgpt- AND language AND education" OR	Search within Title and Abstract Language: English Document Type: Article Research Area: Education Educational Research

		55
TESL Quarterly	Teaching English as a Second Language Quarterly (TESLQ) (Formerly Journal of Teaching Language Skills) 43(2), Spring 2024, pp. 49-85	**Masoud Azadnia**

CHATGPT-ASSISTED LANGUAGE LEARNING AND TEACHING

Database	Search Strings	Filters
	"chatgpt- AND language AND pedagogy"OR "chatgpt- AND language AND education" OR "chatgpt- AND L2/FL language AND pedagogy"	
Science Direct	Chatgpt AND L2/FL language learning/teaching AND Chatgpt-based L2/FL language education AND Chatgpt in L2/FL language pedagogy	Search within Title, Abstract, and Keywords Document Type: Research Article Language: English Subject Area: Social Sciences

Note: The search process was replicated using the full forms (L2: second language)

As shown in Table 1, no time limitation was imposed in the search process since the growing body of literature on ChatGPT use in various educational contexts owed its origin to the official launch of ChatGPT in late 2022. The search process, conducted in October 2023, resulted in 131 articles from all selected databases. The articles retrieved from the databases were then screened. The screening process resulted in the removal of 33 duplicate copies, one incomplete article, and one risk assessment article published before the official release of ChatGPT (November 2022). The 96 remaining articles were scrutinized for intelligibility throughout a two-stage phase. In the first stage, the titles and abstracts of the articles were scanned. The entire body of the articles that passed the preliminary phase was fully examined in the second stage. A total of 69 articles that breached the eligibility criteria were eliminated from the sample throughout either the title and abstract scanning (n=43) or full-text scanning stage (n=26). The eligibility criteria included (a) being specifically structured around the complementary use of ChatGPT in language education or pedagogy, (b) putting ChatGPT in the focal center of interest, and (c) concentrating on L2/FL learning or teaching.

Throughout the full-text scanning stage, the relevance of all in-text references for being included in the review was examined. To this end, every in-text citation that seemed relevant to the topic under investigation was traced back, retrieved from the databases, and examined whether it qualified for inclusion in the review. Accordingly, three extra works meeting the three eligibility criteria were retrieved from the Scopus database and added to the sample. Subsequently, the quality of all retrieved articles was examined, and two articles that violated the research report standards proposed by Fink (2010) were removed from the sample. Finally, 28 papers that met the rigorous inclusion standards constituted the sample of this review study. Figure 1 illustrates the literature search and selection process grounded on PRISMA-ScR. Using multiple leading databases and

inviting another teaching English as a foreign language (TEFL) scholar to cooperate in article selection minimized potential biases and errors in the search and eligibility processes. A third person (a university professor specializing in applied linguistics) settled the disagreement between the researcher and his assistant on excluding one of the two studies violating the research standards.
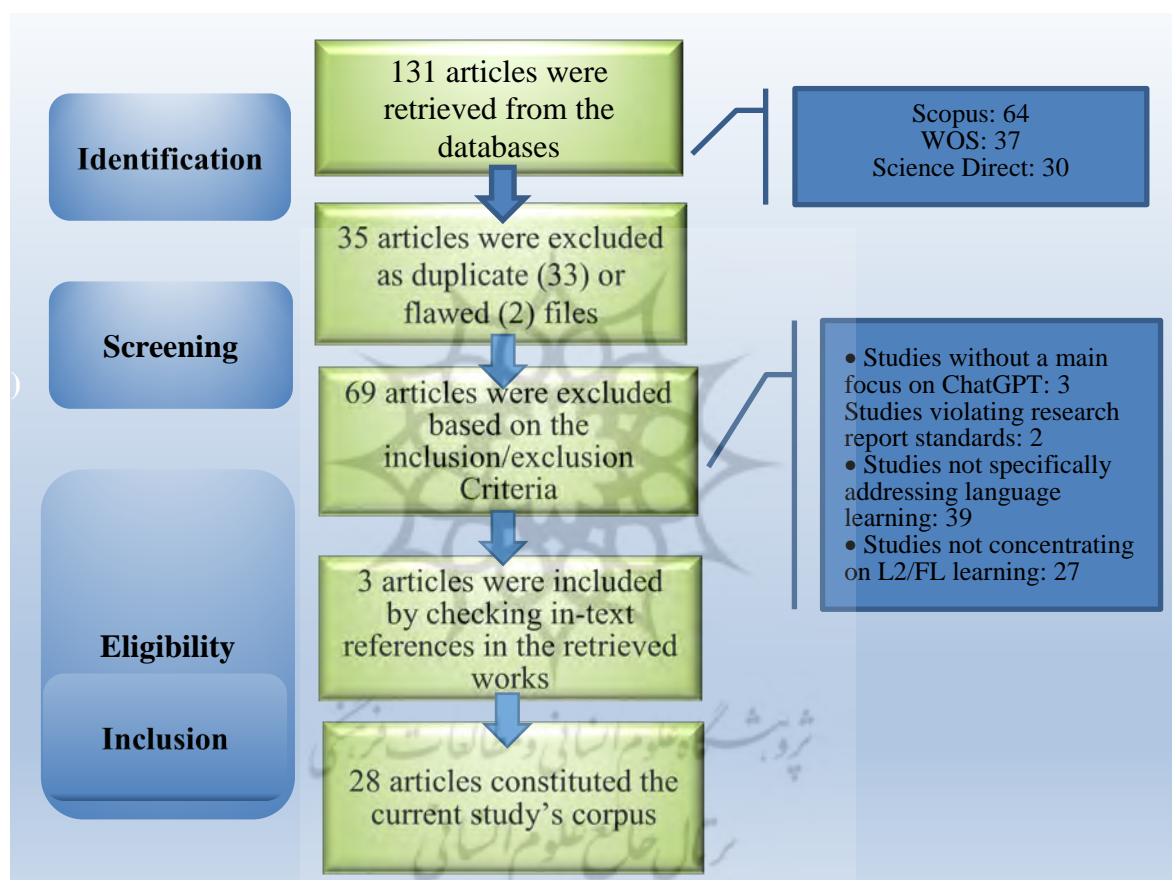

Figure 1. *Flowchart of the Scoping Review based on PRISMA-ScR Guidelines*

Data Extraction, Charting, and Synthesizing

The concluding phase of the review entailed sifting through the chosen studies, descriptive analysis of the articles' content, charting the data describing the research scope under investigation, and synthesizing the results. To this end, the full content of every individual article was scrutinized for any information that explicitly or implicitly signifies the scope of literature on using ChatGPT as a learning tool in language L2/FL education and pedagogy. The summarized descriptions of the 28 studies elaborating on

authors, journals, settings, language domains, objectives, designs, and chief findings were then reported in a tabulated form (See Appendix A). The review data were then integrated based on common themes to outline the research scope reviewed in this paper. Along with descriptive analysis of methodological features depicting the scope of literature on ChatGPT-assisted L2/FL education and pedagogy, thematic analysis of the concluding sections' (Conclusions in review articles and Results, Discussion, and Conclusions in primary research articles) content helped to shape a clear picture of concluding remarks proposed by the literature under review. The thematic analysis entailed (a) reviewing iteratively (twice at least) the target content, (b) annotating the tokens signifying any information that dealt with any probable/actual results of integrating the tool into either formal or informal language instruction, and (c) coding the annotations. The coding followed the three-step scheme proposed by Creswell (2015), including open coding, axial coding, and selective coding. The codes were then used to recognize the most common themes. Descriptive, tabulated, and graphical data helped to provide an integrative and synthesized report of the emerging themes signifying the literature-derived concluding remarks. Before data analysis, six randomly chosen studies (approximately 20% of the entire sample) were analyzed by two independent TEFL professors (the author and the expert invited to supervise the review project) to counter any potential for bias and subjectivity. The inter-coder agreement percentage (73%) ensured coding reliability.

Results

Based on a careful analysis of the titles, abstracts, and full texts, the scope descriptions were grouped under five core headings: research settings, research objectives, research foci, research designs, and concluding remarks.

Research Settings

The table attached to this article (see Appendix A) outlines the scope of the research reviewed in the current paper. As evident in the table, seven articles (25%) were literature review articles that summarized the existing understanding of the topic, and the remaining 21 articles (75%) were thorough reports of primary research conducted in various language learning settings. The 24 primary research reviewed included ten studies based on self-reported data (i.e., beliefs, attitudes, and expectations of ChatGPT's beneficiaries) and 11 studies grounded on post-intervention or comparative data. Of all the original articles (primary research) reviewed, the highest proportion ($f = 17$, $p = 80.95\%$) was

| Teaching English as a Second Language Quarterly (TESLQ)
(Formerly Journal of Teaching Language Skills)
43(2), Spring 2024, pp. 49-85 | **58**
Masoud Azadnia |

CHATGPT-ASSISTED LANGUAGE LEARNING AND TEACHING

carried out in different EFL learning settings, particularly the Chinese one ($f = 4$, $p = 23.53\%$). Accordingly, it could be inferred that the investigation of ChatGPT use in language education and pedagogy is concentrated mainly in various EFL settings worldwide. The other settings where the use of ChatGPT was explored included ESL ($f = 2$, $p = 9.52\%$), German as a foreign language (GFL) ($f = 1$, $p = 4.76\%$), and L2 learning ($f = 4$, $p = 4.76\%$). Figure 2 illustrates the distribution of different settings in the primary research reviewed.
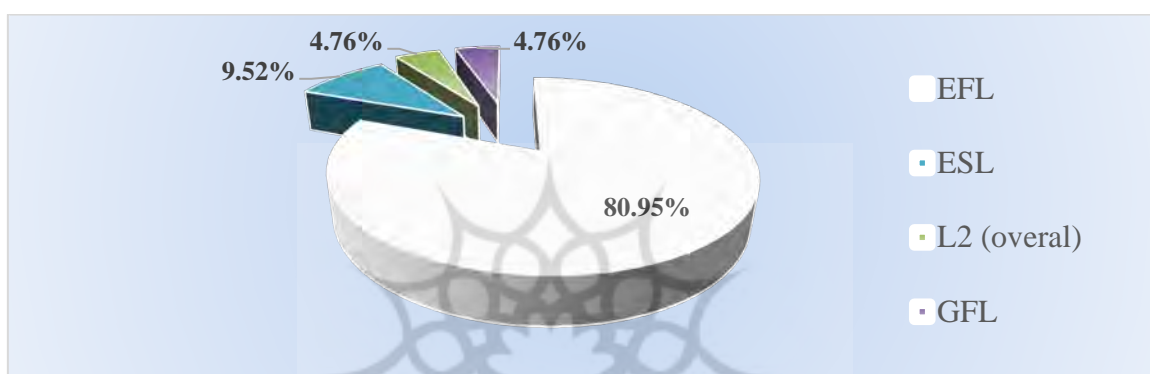

Figure 2. *Research Settings Distribution*

Research Objectives

The review articles reviewed more or less aimed to exploit the previously generated evidential data to spotlight the potential affordances, merits, limitations, challenges, or implications of ChatGPT as discussed in the language learning and teaching realm. The primary studies, on the other hand, pursued a multiplicity of objectives, including exploring (a) the contribution of ChatGPT to the development of cognitive (i.e., autonomy and critical thinking) and affective (i.e., motivation, engagement, and satisfaction) constructs underlying language learning ($f = 4$, $p = 19.05\%$), (b) the efficacy of ChatGPT-assisted instructional programs in promoting language learning skills ($f = 9$, $p = 42.86\%$), (c) models and strategies for integrating ChatGPT into language learning and teaching ($f = 3$, $p = 14.28\%$), and (d) the feasibility and usefulness of ChatGPT for formal and informal language learning/teaching ($f = 5$, $p = 23.81\%$). Figure 3 illustrates the results above.

	Teaching English as a Second Language Quarterly (TESLQ) (Formerly Journal of Teaching Language Skills) 43(2), Spring 2024, pp. 49-85	**59**
		Masoud Azadnia

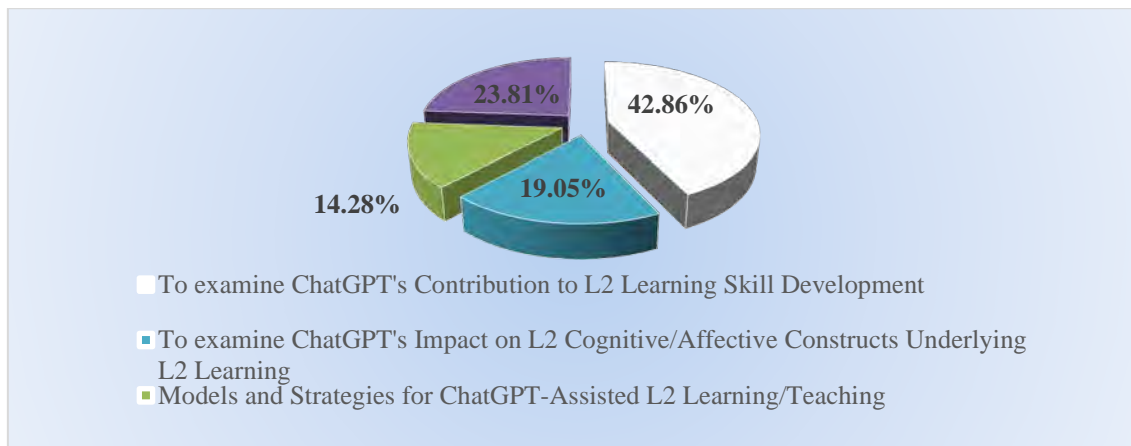CHATGPT-ASSISTED LANGUAGE LEARNING AND TEACHING

Figure 3. *Research Objectives Distribution*

Research Designs and Foci

According to the tabulated descriptions in Appendix A, the vast majority of the literature review studies ($f = 6$, $p = 85.71\%$) were devoted to domains underlying the general field of language pedagogy, including FL/L2 learning/teaching, English language teaching (ELT), and L2 learning assessment. The only review study focused on skill-specific language learning domains was the one by Baskara (2023), which explored the potential benefits and challenges of using ChatGPT in EFL writing instruction. This finding implies the marked inclination of the literature review attempts toward the general L2 learning and teaching domains underlying the language pedagogy field.

The intervention-based original research studies, which constituted more than half of the primary research in the review sample ($f = 12$, $p = 52.38\%$), either evaluating the post-intervention outcomes of ChatGPT-assisted language pedagogy (e.g., Athanassopoulos et al., 2023; Faiz et al., 2023; Haggag, 2023; Han et al., 2023; Harunasari, 2023; Javier & Moorhouse, 2023; Kim et al., 2023; Shaikh et al., 2023; Yan, 2023) or comparing such interventional instruction with mainstream language pedagogy (e.g., Algaraady & Mahyoob, 2023; Guo & Wang, 2023). As outlined in Table 2, the interventions involved in these studies dealt with different techniques and procedures for integrating the functionality of ChatGPT in formal language instruction. Different in length, depth, and sophistication, the interventions ranged from integrating ChatGPT-generated CF into a routine writing curriculum to using carefully designed ChatGPT-assisted practicum and platforms as an integral part of language instruction. Not surprisingly, an overwhelming majority of the intervention-based articles reviewed ($f = 8$, $p = 72.73\%$) were

Teaching English as a Second Language Quarterly (TESLQ)
(Formerly Journal of Teaching Language Skills)
43(2), Spring 2024, pp. 49-85

60

Masoud Azadnia

CHATGPT-ASSISTED LANGUAGE LEARNING AND TEACHING

experimental studies exploring the integration of the textual language processing chatbot into language writing initiatives.

Table 2.

Research Foci of Intervention-based Primary Studies

Foci	ChatGPT-Assisted Intervention	Study	Research Design
Language Writing	Exploiting ChatGPT's performance to spot and analyze writing errors (CF Provider)	Guo and Wang (2023)	Comparative, Descriptive Study
		Algaraady and Mahyoob (2023)	Descriptive Study
	Multi-stage machine-in-the-loop course/practicum/workshops encompassing tool familiarization, text production, tool consultation, text improvement, and tool-assisted text evaluation	Yan (2023)	Multi-method Qualitative Study
		Faiz et al. (2023)	Mixed Methods Study
		Athanassopoulos et al. (2023)	Quasi-experimental Study
	Customized ChatGPT-assisted programs/platforms targeted at improving self-written essays with the help of ChatGPT	Haggag (2023)	One-group, Quasi-experimental Study
		Han et al. (2023)	Experimental (Pre- and Post-survey) Study
	Implementing Multiple Strategies targeted at productive and critical use of ChatGP	Harunasari (2023)	One-shot Case Study
Formal Language Pedagogy	Using ChatGPT's affordances to design and implement instructional materials suited to a specific teaching method	Kim et al. (2023)	Case Study
	Multi-lesson courses encompassing phased familiarization, scaffolded engagement, and ChatGPT/human-assisted evaluation	Shaikh et al. (2023)	Survey-based Exploratory Study
		Javier and Moorhouse (2023)	Action/Practitioner Research

As seen in Table 2, EFL writing was the dominant research domain in the intervention-based primary research reviewed. In more precise terms, most of the intervention-based primary research mainly focused on ChatGPT-assisted writing instruction and the outcomes and features thereof. Notably, the infrequent research studies on domains except language writing ($f = 3$, $p = 27.27\%$) assumed the general domain of language learning and teaching as their focal center of interest and neglected individual language learning skills and sub-skills. The study by Haggag (2023) was the only research that focused on grammar in tandem with writing while investigating the efficacy of ChatGPT-assisted EFL instruction.

	Teaching English as a Second Language Quarterly (TESLQ) (Formerly Journal of Teaching Language Skills) 43(2), Spring 2024, pp. 49-85	**61** Masoud Azadnia

CHATGPT-ASSISTED LANGUAGE LEARNING AND TEACHING

Table 3.

Research Foci of Non-Intervention Primary Studies

Foci	Participant	Study	Research Design
Language Writing	EFL Teachers	Nguyen (2023)	Mixed Methods Study
Informal Language Learning	EFL Learners	Liu and Ma (2023)	Quantitative Cross-Sectional Study
Formal Language Pedagogy	EFL Learners	Agustini (2023)	Mixed Methods Study
		Liu (2023)	Descriptive Survey Research (quantitative)
		Xia and Zhi (2023)	Descriptive Survey Research (qualitative)
	EFL Teachers	Mohamed (2023)	Descriptive survey Research (qualitative)
		Ulla (2023)	Descriptive Survey Research (qualitative)
	EFL teachers and learners	Ali et al. (2023)	Descriptive Survey Research (quantitative)
	L2/FL researchers	Bin-Hady et al. (2023)	Grounded Theory (GT)
	YouTube content creators	Li et al. (2023)	Mixed Methods Netnography

The non-intervention studies demonstrated in Table 3 employed self-perceived data elicited from L2/FL students, teachers, faculty members, or content developers to explore the impact of ChatGPT in L2 language education and pedagogy. As seen in Table 3, most of the non-intervention studies reviewed ($f = 8$, $p = 80\%$) focused on the general field of language pedagogy. As seen in Tables 2 and 3, both intervention-based and non-intervention studies employed different variants of quantitative, qualitative, and mixed methods designs to accomplish their objectives. Nevertheless, descriptive survey design, which relies upon self-perceived data elicited from Likert-scale questionnaires or guided interviews, was the dominant research design employed by non-intervention primary studies reviewed. It is worth mentioning that the research designs are coded based on Dornyei's (2007) categories of L2 research methods.

	Teaching English as a Second Language Quarterly (TESLQ) (Formerly Journal of Teaching Language Skills) 43(2), Spring 2024, pp. 49-85	**62**
		Masoud Azadnia

CHATGPT-ASSISTED LANGUAGE LEARNING AND TEACHING

Concluding Remarks

As mentioned earlier, three core categories of articles constituted the review sample: literature review articles grounded on the existing literature on the use of ChatGPT in L2/FL education and pedagogy; non-intervention primary research grounded on L2/FL students, teachers, faculty members, or content developers' beliefs, perceptions, and expectations to examine the pros and cons of ChatGPT-assisted language learning/teaching; and intervention-based primary research that explored the applicability and efficacy of integrating ChatGPT into L2/FL instructional programs. The Results, Discussion, and Conclusions sections of the three research groups were analyzed to provide a thematic scheme of the concluding remarks addressed by the literature of focus. According to the thematic analysis results, the codes describing the emerging remarks addressed by each strand of research were grouped under two broad headings: favorable consequences and repercussions. Favorable consequences referred to the fruits of using ChatGPT-assisted L2/FL education and pedagogy, but repercussions dealt with the downside of this innovative paradigm. Based on the codes that emerged during the thematic analysis, favorable consequences included pedagogical outcomes, learning outcomes, or any changes in cognitive (e.g., critical thinking) and affective (e.g., learning motivation) constructs underlying teaching/learning skills. On the other hand, repercussions were either ethical issues pertinent to ChatGPT use in educational settings or technical/executive concerns/challenges encountered while using the tool for language teaching/learning purposes. The thematic scheme of the emerging codes for the three groups of research reviewed is presented in Appendix B (see Figure 4).
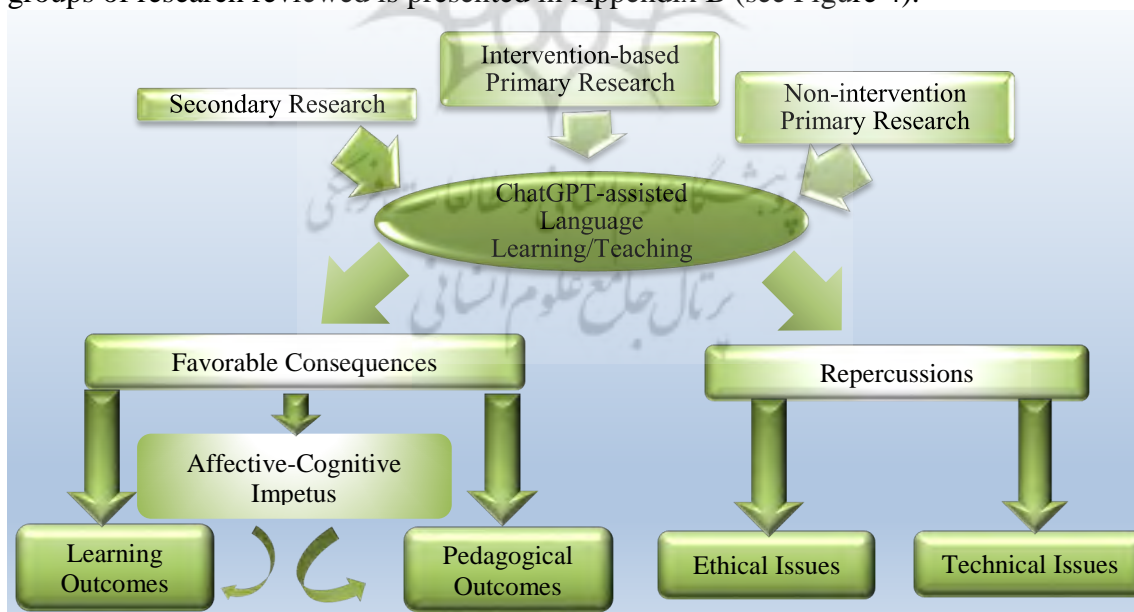

Figure 4. *Thematic Illustration of the Concluding Remarks Addressed by the Articles Reviewed*

	Teaching English as a Second Language Quarterly (TESLQ) (Formerly Journal of Teaching Language Skills) 43(2), Spring 2024, pp. 49-85	**63** Masoud Azadnia

CHATGPT-ASSISTED LANGUAGE LEARNING AND TEACHING

Remarks Addressed by Secondary Research

Literature review articles were the first group of studies scanned meticulously for any conclusions about ChatGPT-assisted L2/FL learning and teaching. As for favorable learning outcomes, most of the review articles regarded language writing skills cultivation as the widely approved potential outcome of ChatGPT-assisted language learning/teaching. Not only the one literature review article focused on EFL writing instruction (Baskara, 2023) but also a remarkable proportion of those targeted at the general domain of L2/FL learning and teaching (e.g., Hong, 2023; Kartal, 2023; Kostka & Toncelli, 2023) underscored the satisfactory outcomes of integrating ChatGPT into language writing instruction. As concluded by Baskara (2023), the materialization of this technological intervention in either formal or informal language learning contexts may have a direct bearing on various skills underlying the writing competence of L2/FL learners, including topic/content planning, paragraph development, and coherence or language structure evaluation. The other widely-accepted outcomes of ChatGPT-assisted language learning/teaching, as concluded by secondary research under review, were its positive contribution to reading and comprehension skills cultivation (Baskara & Mukarto, 2023; Kartal, 2023), contextualized vocabulary learning (Kartal, 2023; Kostka & Toncelli, 2023), and pronunciation improvement (Kartal, 2023). A dyad of the studies (Hong, 2023; Kohnke et al., 2023) also concluded that incorporating ChatGPT into L2/FL education and pedagogy may enhance purposeful language learning practice.

Along with the learning outcomes enumerated above, the literature reviewed referred to some alternatives and innovations in teaching and assessment methods as the probable fruits of ChatGPT-assisted pedagogy. For instance, relying upon evidential data underscoring the capability of ChatGPT to provide tutorial language instruction beyond the classroom setting, a couple of studies reviewed (Hong, 2023; Kostka & Toncelli, 2023) inferred that the integration of ChatGPT in language pedagogy may lay the foundations for implementing flipped language instruction, which is grounded on enhanced student-teacher interaction while practicing the previously learned pieces of the target content. As declared by two of the seven literature review articles (i.e., Baskara & Mukarto, 2023; Kostka & Toncelli, 2023), ChatGPT-generated lesson plans, agendas, and materials well suited to the demands of a specific instructional situation, as pedagogical merits of ChatGPT-assisted language instruction, could contribute to the success and effectiveness of teaching practices. Additionally, the study by Moqbel and Al-kadi (2023) concluded that the integration of ChatGPT into language pedagogy may swing the pendulum of language assessment from a quantitative evaluation of learner-generated

Teaching English as a Second Language Quarterly (TESLQ) (Formerly Journal of Teaching Language Skills) 43(2), Spring 2024, pp. 49-85	**64** Masoud Azadnia

CHATGPT-ASSISTED LANGUAGE LEARNING AND TEACHING

language products to a mixed (qualitative and quantitative) scrutiny of both learning routes and products.

The thematic analysis of the literature review articles revealed that the desired outcomes of using ChatGPT as a supportive L2/FL learning/teaching tool were not confined to its likely impact on learning skills, teaching quality and methods, and approaches to assessment. The use of this natural language processing tool could also contribute to the cultivation or enhancement of various affective and cognitive constructs, each acting as an asset to L2/FL learners or teachers seeking success in language learning and teaching. Active and meaningful engagement in language learning (Baskara, 2023; Kohnke et al., 2023; Moqbel & Al-kadi, 2023), critical thinking skills (Kartal, 2023; Kostka & Toncelli, 2023), self-assessment and self-reflection skills (Moqbel & Al-kadi, 2023), and motivation for developing writing skills (Baskara, 2023) were the cognitive and affective constructs underscored in the secondary research under investigation.

The results also revealed several concluding remarks spotlighting the downside of ChatGPT-assisted L2/FL education and pedagogy caused by design drawbacks or technical features inherent in most LLMs like ChatGPT. The unfavorable outcomes dealt with ethical concerns over personal information leakage (Baskara, 2023; Kostka & Toncelli, 2023), prefabricated language use threatening academic/scholarly integrity (Kartal, 2023; Kohnke et al., 2023; Kostka & Toncelli, 2023), and massive job loss among language teachers (Baskara & Mukarto, 2023). The other strand of repercussions highlighted in the literature review articles was the challenges and difficulties posed by the design or technical features of ChatGPT, which open room for doubt on ChatGPT-generated output. These widely approved undesirable outcomes included contextually unreliable (Baskara, 2023; Baskara & Mukarto, 2023; Kartal, 2023; Kohnke et al., 2023; Kostka & Toncelli, 2023) and culturally biased (Kartal, 2023; Kohnke et al., 2023) data yielding flawed language use internalization and readily available information inhibiting independent language production (Kostka & Toncelli, 2023; Moqbel & Al-kadi, 2023). Additionally, as declared by Kartal (2023), a machine-made responding system devoid of human-like support, emotion, consciousness, and understanding could jeopardize the depth and quality of language learning experiences. As another undesirable outcome, Baskara and Mukarto (2023) referred to ChatGPT's deficiency in comprehending highly abstract concepts, which may impose limitations on sophisticated users seeking complex language learning/teaching concepts. Finally, Kohnke et al. (2023) regarded the interconnectedness between their familiarity with the tool's affordances and their

	Teaching English as a Second Language Quarterly (TESLQ) (Formerly Journal of Teaching Language Skills) 43(2), Spring 2024, pp. 49-85	**65** Masoud Azadnia

CHATGPT-ASSISTED LANGUAGE LEARNING AND TEACHING

advances in language learning/teaching purposes as another design issue disadvantaging ChatGPT users.

Addressed by Non-intervention Primary Research

The second group of the studies reviewed included non-intervention primary research seeking to explore the thoughts, perspectives, and views of different classes of ChatGPT's beneficiaries on integrating the tool into L2/FL education and pedagogy and the advantages and disadvantages thereof. Similar to the concluding remarks made by the literature review studies, those addressed by non-intervention studies corresponded to the two macro and five micro categories in Figure 4. Concerning favorable consequences, ChatGPT's potential for developing different language learning skills was the common ground between a remarkable proportion of the studies (Bin-Hady et al., 2023; Li et al., 2023; Liu, 2023; Liu & Ma., 2023; Ulla et al., 2023). As concluded by Li et al. (2023), the tool is also suitable for language skills improvement among learners struggling with mainstream teaching methods or those with special learning needs. Nevertheless, the studies diverged markedly in making inferences about the usability of ChatGPT for developing an array of language learning skills (Agustini, 2023), grammatical knowledge (Ulla et al., 2023), or reading and writing skills (Liu & Ma., 2023; Ulla et al., 2023). As another area of partial diversity, while most studies revealing the positive contribution of ChatGPT-assisted language learning to language skills development focused on formal language pedagogy, Liu and Ma (2023) pinpointed that the integration of ChatGPT into informal language instruction yields language system development. Based on the conclusions made by a couple of non-intervention studies (Mohamed, 2023; Ulla et al., 2023), another positive learning outcome of such computer-assisted instruction could be helping language learners play a central role in their learning journey.

As far as pedagogical favorable consequences are concerned, the studies reviewed concluded that the supplementary use of ChatGPT in language pedagogy could profit L2/FL teachers to access the time, energy, instructional plans/schedule, and needs-driven materials they require to implement a thriving teaching practice (Nguyen, 2023; Li et al., 2023; Ulla et al., 2023), achieve their potential and consolidate their leading position (Bin-Hady et al., 2023), and forge effective interactional relations with their learners (Ulla et al., 2023). Xiao & Zhi (2023) also pinpointed that ChatGPT-assisted language pedagogy caters to those seeking private language tutoring.

The last strand of favorable outcomes proposed by non-intervention studies explained that the supportive use of this tool in language education and pedagogy helps language learners develop a wide array of cognitive and affective constructs, playing an

Teaching English as a Second Language Quarterly (TESLQ) (Formerly Journal of Teaching Language Skills) 43(2), Spring 2024, pp. 49-85	66 Masoud Azadnia

CHATGPT-ASSISTED LANGUAGE LEARNING AND TEACHING

intermediary role in cultivating various learning and teaching skills. Based on the results, these mediator constructs included learning autonomy (Agustini, 2023; Bin-Hady et al., 2023; Liu, 2023), critical thinking (Xiao & Zhi., 2023), problem-solving (Liu, 2023), creativity and innovation (Nguyen, 2023), self-reflection and assessment (Agustini, 2023), cultural awareness (Liu & Ma., 2023), digital literacy (Nguyen, 2023), and attentiveness skills (Li et al., 2023). As concluded by some of the studies, the supplementary use of ChatGPT in L2/FL instruction could also indirectly trigger language learning and teaching by motivating learners to develop language learning skills (Ali et al., 2023; Li et al., 2023; Mohamed, 2023; Nguyen, 2023), embark on beyond-class language practice (Liu, 2023), and cultivate autonomous language learning skills (Ali et al., 2023). According to the review results, the other affective assets influenced by the use of chatGPT in language learning and teaching included learning confidence (Mohamed, 2023; Nguyen, 2023), pleasure (Li et al., 2023; Liu, 2023), support (Mohamed, 2023), and comfort (Li et al., 2023).

Regarding the repercussions of ChatGPT-assisted language instruction, the potential threat to academic integrity posed by several notorious cases of using readily available machine-made texts by language learners and researchers was the common ground in the majority of the non-intervention studies reviewed (Li et al., 2023; Liu, 2023; Mohamed, 2023; Nguyen, 2023; Ulla et al., 2023; Xiao & Zhi, 2023). As concluded by those who took advantage of ChatGPT in their language learning and teaching endeavors, the possibility of being provided with culturally biased or contextually inaccurate information (Agustini, 2023; Li et al., 2023; Liu, 2023; Mohamed, 2023; Ulla et al., 2023), over-dependence on ChatGPT-generated output (Li et al., 2023; Nguyen, 2023; Ulla et al., 2023), and personal data leakage (Li et al., 2023; Liu, 2023; Mohamed, 2023) could risk the efficacy of ChaGPT-assisted language learning. The direct bearing of language proficiency, digital literacy, ChatGPT familiarity, and teaching expertise on users' attitudes toward the applicability and suitability of the tool was referred to as another unpleasant consequence of ChatGPT-assisted language instruction (Agustini, 2023; Ali et al., 2023).

Remarks Addressed by Intervention-based Primary Research

The last bundle of articles scrutinized dealt with primary research that explored the efficacy of ChatGPT-assisted instruction, incorporating the bot's affordances into formal language instruction in various L2/FL learning contexts. As revealed by the results, a high proportion of the intervention-based studies reviewed (Guo & Wang, 2023; Haggag, 2023; Han et al., 2023; Harunasari, 2023; Shaikh et al., 2023; Yan, 2023) arrived at a

Teaching English as a Second Language Quarterly (TESLQ)
(Formerly Journal of Teaching Language Skills)
43(2), Spring 2024, pp. 49-85

67

Masoud Azadnia

CHATGPT-ASSISTED LANGUAGE LEARNING AND TEACHING

consensus that ChatGPT-assisted instruction fosters language writing skills. Even though the operationalization of the term *quality* varied from a one-dimensional definition whereby writing quality points to lexical uniqueness (Athanasspoulos et al., 2023) to a multidimensional concept encompassing grammatical accuracy, lexical richness and overall composition structure (Faiz et al., 2023), there was a common consensus in concluding that ChatGPT-assisted language instruction results in a significant improvement in writing quality. Empirical evidence also showed that such instruction helps learners enhance their writing length (Athanasspoulos et al., 2023). Varying in techniques and strategies used to integrate ChatGPT into mainstream writing instruction (see Table 2), the studies focused on writing skills diverged in explaining reasons behind the positive contribution of the integrally used ChatGPT assistance to writing skills cultivation and enhancement. Though writing skills development was concluded to be the core far-reaching consequence of ChatGPT-assisted instruction, there was also empirical evidence showing the contributory role of the instruction in fostering other language learning subskills, such as vocabulary and grammar (Shaikh et al., 2023) and facilitating productive (Javier & Moorhouse, 2023) and authentic (Kim et al., 2023) language learning in a conversational and immersion-based learning environment.

The review results revealed that using ChatGPT in formal language instruction could profit the teaching profession. Comparing ChatGPT-generated and instructors-generated comments, Guo and Wang (2023) declared that more detailed, balanced, directive and comprehensive CF provided by ChatGPT cater to language learners interested in making progress in writing. The other comparative study by Algaraady and Mahyoob (2023) concluded that the lengthier and more comprehensive comments targeted at surface-level errors make learners improve in writing; however, for more drastic changes in their writing quality, the ChatGPT-generated comments need to be accompanied by instructors' nuanced comments on deep-structure and pragmatic errors. The facilitating role of ChatGPT in teaching has also been approved by Shaikh et al. (2023), who believed that the immediately and automatically generated responses provided by ChatGPT could compensate for human teachers' inaccessibility beyond the classroom setting. The review of concluding remarks addressed by the intervention-based research also revealed the suitability and capability of ChatGPT for materializing a couple of popular language teaching methods, such as the TBLT (Kim et al., 2023) and flipped classrooms (Yan, 2023).

The results also yielded several conclusions concerning the third category of favorable outcomes, namely cognitive skills or affective constructs essential in language

| | Teaching English as a Second Language Quarterly (TESLQ) (Formerly Journal of Teaching Language Skills) 43(2), Spring 2024, pp. 49-85 | **68** Masoud Azadnia |

CHATGPT-ASSISTED LANGUAGE LEARNING AND TEACHING

learning and teaching. For instance, Javier and Moorhouse (2023) concluded that an instructional package designed to officially teach learners how to harness the full potential of ChatGPT for language learning purposes could equip them with adequate knowledge of being involved in machine-human conversations/interactions to produce and practice language while taking account of the tools' technical limitations and content flaws. This practical outcome seems in line with the contributory role of ChatGPT in fostering critical thinking skills, as evidenced in the study by Harunassari (2023). Additionally, a couple of the studies reviewed concluded that the operating instructions and scaffolded experimental activities integrated into the conventional writing instruction enable learners to find a balance between the ChatGPT-offered assistance and their self-directed writing skills (Faiz et al., 2023; Javier & Moorhouse, 2023). As another concluding remark, it was found that the affective constructs significantly influenced by the supplementary use of ChatGPT in formal language education included language learning motivation, pleasure, and comfort (Shaikh et al., 2023), and learner self-esteem (Guo & Wang, 2023).

The review of the intervention-based primary research on ChatGPT-assisted language instruction evidenced several ethical and technical concerns about using the tool in formal language learning settings. One ethical issue corroborated by Yan et al. (2023) was the concern about using prefabricated language units, which could potentially jeopardize the vital issue of academic integrity. The study by Harunasari (2023) testified to the detrimental impacts of learners' overreliance on machine-made information and texts. There were also empirical data showing the incapability of ChatGPT-generated CF to approximate the sophisticated, nuanced, easy-to-locate, and coherent nature of human-like comments and suggestions (Algaraady & Mahyoob, 2023; Kim et al., 2023). As concluded by Algaraady and Mahyoob (2023), directive and lengthy notwithstanding, ChatGPT-generated CF could hardly detect and analyze pragmatic and deep-structure errors. The study by Harunasari (2023) drew an inference that distractions arising while using ChatGPT, as well as difficulties in accessing chat history data showing learners' learning progress, could pose several challenges to teachers interested in learning monitoring. The unsuitability of the chatbot for speaking and listening skills cultivation (Shaikh et al., 2023; Kim et al., 2023), the possibility of producing culturally biased output (Kim et al., 2023), and the interdependence between instructional outcomes and learners' familiarity with affordances and limitations of the tool (Faiz et al., 2023; Han et al., 2023; Harunasari, 2023) were the other unfortunate consequences proposed by the intervention-based studies reviewed.

Teaching English as a Second Language Quarterly (TESLQ)
(Formerly Journal of Teaching Language Skills)
43(2), Spring 2024, pp. 49-85

69

Masoud Azadnia

CHATGPT-ASSISTED LANGUAGE LEARNING AND TEACHING

Discussion

The current scoping review mapped and evaluated the growing literature on using ChatGPT in language education and pedagogy. To this end, a priori review protocol grounded on PRISMA-ScR guidelines was developed and implemented to review 28 peer-reviewed articles constituting the review sample. The research body retrieved from the literature was mainly concerned with primary research based on intervention-based or non-interventional exploration of the applicability and effectiveness of incorporating ChatGPT's affordances into mainstream L2/FL instruction. Nevertheless, the proportion of review articles grounded on the existing theoretical underpinnings and evidential data on the field under review seemed noteworthy. One reasonable explanation for the dominance of primary research in the literature under review may be attributed to the limited span of ChatGPT release and application for educational purposes. The finding also could be corroborated by Amini Farsani et al.'s (2021) conclusion that secondary research constitutes a negligible proportion of the applied linguistics literature.

Detailed scrutiny of the research settings revealed that the bulk of secondary and primary research reviewed was conducted in different EFL settings worldwide, specifically the Chinese one. The results also showed the dominance of language writing skills (a skill-specific domain) in the intervention-based primary research. In contrast, the vast body of secondary and non-intervention research on the topic of focus was concentrated on domains underlying the general field of formal language pedagogy. The text-based nature of language processing systems in chatbots lends support to the marked inclination of researchers to leverage ChatGPT's affordances in fostering language writing, a text-based productive skill in need of written prompts and samples. On the other hand, secondary research and original research studies not bounded with skill-specific treatments and interventions may find room to approach the topic generally, focusing on different instructional, assessment, and learning domains underlying the formal language pedagogy field. Although ChatGPT-assisted L2/FL education and pedagogy have been explored from different quantitative, qualitative, and mixed methods stances, the number of studies descriptive studies relied on qualitative data elicited from ChatGPT's beneficiaries exceeded other research types. Contrary to the finding of Amini Farsani et al.'s (2021) study, showing the ascendency of quantitative and mixed-method applied linguistic studies over their qualitative counterparts, the finding seems justifiable owing to the immature nature of the literature reviewed. The high number of qualitative design research studies on the topic under review may be attributed to the need to address an undetected research area through in-depth qualitative approaches.

Teaching English as a Second Language Quarterly (TESLQ) (Formerly Journal of Teaching Language Skills) 43(2), Spring 2024, pp. 49-85	70 Masoud Azadnia

CHATGPT-ASSISTED LANGUAGE LEARNING AND TEACHING

Qualitative analysis of the article sections centering around the findings, practical insights, and concluding remarks yielded a thematic scheme encompassing learning outcomes, pedagogical outcomes, affective/cognitive impetus for language teaching/learning, ethical issues, and technical repercussions. Cultivating a wide array of writing skills was regarded as the predominant learning outcome of ChatGPT-assisted language instruction by a remarkable proportion of primary research reviewed in this scoping attempt. Reading comprehension, grammar, and vocabulary were other language learning facets potentially and practically influenced by the complementary use of ChatGPT in mainstream language learning, as evidenced by some secondary and primary research. Though echoed by a negligible number of literature review articles and some non-intervention-based studies, improving language pronunciation was not an outcome witnessed by intervention-based primary research. This finding seems reasonable given that compared to a subskill tightly related to oral skills (i.e., pronunciation), reading, grammar, and vocabulary learning seem more achievable while developing writing skills, the area of focal focus in the study of ChatGPT-assisted language learning. There was also faint evidence showing a productive and authentic learning atmosphere as a practical consequence of integrating the tool into mainstream language instruction. As a careful reflection on learning outcomes suggests, no experimental evidence was found to consolidate theoretical underpinnings and perceptions validating the bearings of such technology-aided instruction on learner-centeredness in language learning. Accordingly, measuring these learning features may grasp the interest of future researchers engrossed in the topic. Additionally, given that research on ChatGPT-assisted language learning has been sharply focused on formal instruction, future research could address the dearth of evidence on informal language learning paradigms and the consequences thereof.

As shown by the review results, compared with learning developments, the pedagogical outcomes of a ChatGPT-assisted pedagogy were much more distinct and equally supported by the primary and secondary research reviewed. As a concluding remark made by the literature review articles, ChatGPT's specific affordances, such as providing a customizable instructional agenda, materials, and quizzes/tests, could result in facilitating a promising, needs-specific teaching practice, which helps teachers exploit their time, energy, and leadership potential as the learning coordinator. The voices expressed by ChatGPT's beneficiaries also echoed this potential outcome. Similarly, the observation or post-intervention results drawn from the actual practice of ChatGPT-assisted pedagogy showed the facilitating role of ChatGPT in helping teachers consolidate their authority. There is also evidential data showing that the tool could

	Teaching English as a Second Language Quarterly (TESLQ) (Formerly Journal of Teaching Language Skills) 43(2), Spring 2024, pp. 49-85	**71** Masoud Azadnia

CHATGPT-ASSISTED LANGUAGE LEARNING AND TEACHING

facilitate the implementation of learner-centered, practice-oriented teaching approaches, such as flipped language instruction and TBLT, as well as multidimensional language learning assessment techniques. The literature reviewed suggested that ChatGPT could also help language instructors consolidate their monitoring role, amalgamating timely, comprehensive, and personalized machine-made CF into their in-depth and nuanced comments and suggestions. As a tentative area in dire need of exploration, the influences that ChatGPT exerts on an informal language pedagogy could be addressed by research.

Based on the review of non-intervention studies built upon the voices of ChatGPT's beneficiaries, the cognitive constructs affected positively by ChatGPT-assisted instruction included actively engaged mindsets; self-directed/autonomous learning skills, such as self-assessment and self-reflection; 21st-century learning skills, such as critical thinking, digital literacy, creativity, innovation, and problem-solving; attentiveness skills; and cultural awareness. The contribution of ChatGPT to learning autonomy, critical thinking, and active mental engagement has also been underscored by the literature review articles. Among the broad range of cognitive assets enumerated above, the contributory role of ChatGPT in cultivating several skills underlying 21st-century literacy, such as critical thinking, practical knowledge of digital learning aids' affordances, and autonomous learning, have been backed up by the intervention-based primary research. Based on the review results, among the likely emotional outcomes of ChatGPT-assisted instruction, learning pleasure, comfort, motivation, and self-esteem were those much more predictable in actual practice. The fact that changes witnessed in the affective and cognitive constructs above were either observed by researchers or reported by participants of the studies reviewed necessitates measuring the significance of these probable changes through psychometric tests.

As revealed by analyzing the content of the primary and secondary research under review, the downside of using ChatGPT as a learning or teaching aid stems from several design features, such as the absence of reference/citation systems and the provision of ready-made texts, which could open room for plagiarism and over-dependence on prefabricated text use. Along with the ethical threats above, most studies reviewed concluded that the interdependence between users' practical knowledge of ChatGPT and the extent to which they thrive in implementing the tool seems to be a severe technical concern. Additionally, the review results revealed that the supplementary use of ChatGPT in language learning or teaching initiatives could potentially yield unreasonable outcomes, such as privacy violation, flawed information fossilization, and mass unemployment in the global teacher community. A concluding remark shared within the

Teaching English as a Second Language Quarterly (TESLQ)	**72**
(Formerly Journal of Teaching Language Skills)	
43(2), Spring 2024, pp. 49-85	Masoud Azadnia

CHATGPT-ASSISTED LANGUAGE LEARNING AND TEACHING

intervention-based literature reviewed was that ChatGPT-assisted formal instruction may fail to realize its full potential owing to technical shortcomings in providing CF on deep-structure and pragmatic errors, distractions arising while operating the tool, restrictions in accessing history data, and the lack of facilities required for developing speaking and listening skills.

Conclusion

The current scoping review implied that the rapidly growing literature on ChatGPT-assisted L2/FL education and pedagogy is dominated by primary research on the applicability, useability, and efficacy of incorporating specific affordances and capabilities of the chatbot in mainstream instruction in different EFL settings. Favoring descriptive designs and employing qualitative data elicited from language learners and teachers making the supplementary use of the chatbot in their formal learning/teaching journey, the primary research body emerged hitherto refers to ChatGPT-assisted language instruction as a quick and sure way to writing competence cultivation. This empirically validated evidence could be supported by the evidential data drawn from secondary research on the field. The review of the literature-derived findings also suggested that the instruction, along with advances in micro-skills underlying language writing skills, offers language learners golden opportunities to proceed in improving language skills/sub-skills tightly interwoven with writing, such as reading comprehension, vocabulary, and grammar. The research body reviewed also introduced L2/FL pedagogy as another domain that profited from the complementary use of ChatGPT. As suggested by the review results, the fruits of ChatGPT for language pedagogy range from making a teaching practice thrive to facilitating learner-centered teaching methods and multidimensional learning assessment. The literature reviewed also elucidated the mediating role of ChatGPT-assisted language pedagogy on several cognitive and affective impetus for language learning and teaching skills cultivation, such as 21st-century literacy, learning comfort and pleasure, and motivation for language learning. It also reminded those favoring the incorporation of the recent decade's breakthrough in mainstream language pedagogy about several design flaws evoking ethical and technical concerns such as academic integrity violation or machine-made information abuse.

Several limitations likely to influence the findings' credibility need to be acknowledged. The partially short history of ChatGPT use (less than one year) and rigorously chosen inclusion criteria aligned with the review objectives resulted in a limited sample of studies. This limited sample size hardly allowed for filtering out articles

| | Teaching English as a Second Language Quarterly (TESLQ)
(Formerly Journal of Teaching Language Skills)
43(2), Spring 2024, pp. 49-85 | **73**
Masoud Azadnia |

CHATGPT-ASSISTED LANGUAGE LEARNING AND TEACHING

based on quality indices such as citation index; accordingly, a heterogeneous-quality article sample was analyzed in this systematic review. Additionally, though search strings were framed in a detailed way to include all studies centering around any L2/FL, most of the studies that were retrieved were concerned with English language learning and teaching. Moreover, given the fast-paced nature of the literature on ChatGPT use in educational landscapes, a potentially large body of missing research studies would qualify as relevant works at the time of submission and publication of this review. As another limitation, methodological differences within the review sample hindered coming to an integrative scheme mapping the literature on the domain under review. There were also practical constraints on examining the quality of the studies included in the review sample through methodological synthesis. Finally, most studies in the review sample contained no detail about the Chabot's versions. Even though knowing the exact versions of the chatbot utilized in the empirical studies seemed unnecessary given the specific review objectives, details of this kind could facilitate the interdependence between advances made in the bot and the changes in its negative and positive influences on L2/FL education and pedagogy.

References

Agustini, N. P. O. (2023). Examining the role of ChatGPT as a learning tool in promoting students' English language learning autonomy relevant to Kurikulum Merdeka Belajar. *EDUKASIA: Jurnal Pendidikan dan Pembelajaran*, *4*(2), 921–934.

Teaching English as a Second Language Quarterly (TESLQ)
(Formerly Journal of Teaching Language Skills)
43(2), Spring 2024, pp. 49-85

74

Masoud Azadnia

CHATGPT-ASSISTED LANGUAGE LEARNING AND TEACHING

Algaraady, J., & Mahyoob, M. (2023). ChatGPT's Capabilities in Spotting and Analyzing Writing Errors Experienced by EFL Learners. *Arab World English Journal (AWEJ), Special Issue on CALL, 9*, 3–17. https://dx.doi.org/10.24093/awej/call9.1

Ali, J. K. M., Shamsan, M. A. A., Hezam, T. A., and Mohammed, A. A. (2023). Impact of chat GPT on learning motivation: teachers and students' voices. *Journal of English Studies in Arabia Felix,2*(1),41–49. https://doi.org/10.56540/jesaf.v2i1.51

Aljanabi, M., Ghazi, M., & Ali, A. H. (2023). ChatGPT: Open Possibilities. *Iraqi Journal for Computer Science and Mathematics*, *4*(1),62–64. https://doi.org/10.52866/20ijcsm.2023.01.01.0018

Amini Farsani, M., Jamali, H. R., Beikmohammadi, M., Daneshvar Ghorbani, B., & Soleimani, L. (2021). Methodological orientations, academic citations, and scientific collaboration in applied linguistics: What do research synthesis and bibliometrics indicate? *System*, 100, 102547. https://doi.org/10.1016/j.system.2021.102547

Athanassopoulos, S., Manoli, P., Gouvi, M., Lavidas, K., & Komis, V. (2023). The use of ChatGPT as a learning tool to improve foreign language writing in a multilingual and multicultural classroom. *Advances in Mobile Learning Educational Research*, *3*(2), 818–824. https://doi.org/10.25082/AMLER.2023.02.009

Baskara, R. (2023). Integrating ChatGPT into EFL writing instruction: Benefits and challenges. *International Journal of Education and Learning*, *5*(1), 44–55. http://dx.doi.org/10.31763/ijele.v5i1.858

Baskara, R., Mukarto, M. (2023). Exploring the Implications of ChatGPT for Language Learning in Higher Education. *Indonesian Journal of English Language Teaching and Applied Linguistics*, *7*(2), 343–358. http://dx.doi.org/10.210 93/ijeltal.v7i2.1387

Bibauw, S., Noortgate, W. V. D., Francois, T., & Desmet, P. (2022). Dialogue systems for language learning: a meta-analysis. Language Learning & Technology, *26*(1), 1–25.

Bin-Hady, W. R. A., Al-Kadi, A., Hazaea, A., & Ali, J. K. M. (2023). Exploring the dimensions of ChatGPT in English language learning: a global perspective. *Library Hi Tech*. Advance online publication. https://doi.org/10.1108/LHT-05-2023-0200

Buriak, J. M., Akinwande, D., Artzi, N., Brinker, C. J., Burrows, C., Chan, W. C., ... & Ye, J. (2023). Best practices for using AI when writing scientific manuscripts: Caution, care, and consideration: Creative science depends on It. *ACS nano*, *17*, 4091–4093. https://doi.org/10.1021/acsnano.3c01544

Braun V., Clarke V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Chen, X., Zou, D., Cheng, G., & Xie, H. (2021). Artificial intelligence-assisted personalized language learning: Systematic review and co-citation analysis. *International Conference on Advanced Learning Technologies (ICALT)*, 241–245. https://doi.org/10.1109/ICALT52272.2021.00079

Creswell, J. (2015). *30 essential skills for the qualitative researcher*. SAGE.

Faiz, R., Bilal, H. A., Asghar, I., & Safdar, A. (2023). Optimizing ChatGPT as a writing aid for EFL learners: Balancing assistance and skill development in writing proficiency. *Linguistic Forum*, *5*(3), 24–37. https://doi.org/10.53057/linfo/2023.5.3.3

Fink, A. (2010). *Conducting research literature reviews: from the internet to paper (3rd ed.)*. SAGE Publications.

| | Teaching English as a Second Language Quarterly (TESLQ)
(Formerly Journal of Teaching Language Skills)
43(2), Spring 2024, pp. 49-85 | **75**
Masoud Azadnia |

CHATGPT-ASSISTED LANGUAGE LEARNING AND TEACHING

George, A. S., & George, A. H. (2023). A Review of ChatGPT's impact on several business sectors. *Partners Universal International Innovation Journal*, *1*(1), 9–23. https://doi.org/10.5281/zenodo.7644359

Guo, K., & Wang, D. (2023). To resist it or to embrace it? Examining ChatGPT's potential to support teacher feedback in EFL writing. *Education and Information Technologies.* Advance online publication. https://doi.org/10.1007/s10639-023-12146-0

Haggag, H. M. (2023). A program based on chat generative pre-trained text transformer (ChatGPT) for enhancing EFL majors' descriptive paragraph writing skills and their English grammar use. *Journal of the Faculty of Education in Assiut*, *39*(6), 1–29. https://doi.org/10.21608/mfes.2023.315599

Han, J., Yoo, H., Kim, Y., Myung, J., Kim, M., Lim, H., ... & Oh, A. (2023, July). RECIPE: How to integrate ChatGPT into EFL writing education [Paper presentation]. The Tenth ACM Conference on Learning, Copenhagen, Denmark. https://doi.org/10.1145/3573051.3596200

Harunasari, S. Y. (2023). Examining the effectiveness of AI-integrated approach in EFL writing: A case of ChatGPT. *International Journal of Progressive Sciences and Technologies (IJPSAT), 39*(2), 357–368.

Hong, W. C. H. (2023). The impact of ChatGPT on foreign language teaching and learning: opportunities in education and research. *Journal of Educational Technology and Innovation*, 37–45.

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

Imran, M., & Almusharraf, N. (2023). Analyzing the role of ChatGPT as a writing assistant at higher education level: A systematic review of the literature. *Contemporary Educational Technology*, *15*(4), 1-14. https://doi.org/10.30935/cedtech/13605

Javier, D. R. C., & Moorhouse, B. L. (2023). Developing secondary school English language learners' productive and critical use of ChatGPT. *TESOL Journal*. Advance online publication. https://doi.org/10.1002/tesj.755

Jeon, J., & Lee, S. (2023). Large language models in education: A focus on the complementary relationship between human teachers and ChatGPT. *Education and Information Technologies*, *28*, 15873–15892. https://doi.org/10.1007/s10639-023-11834-1

Jiang, J., Karran, A. J., Coursaris, C. K., Leger, P.-M., & Beringer, J. (2022). A situation awareness perspective on human–AI interaction: Tensions and opportunities. *International Journal of Human–Computer Interaction*, *39*(9), 1–18. https://doi.org/10.1080/10447318.2022. 2093863

Jiao, W., Wang, W., Huang, J. T, Wang, X., & Tu, Z. (2023). Is ChatGPT a good translator? A preliminary study. *arXiv preprint*. https://doi.org/10.48550/arXiv.2301.08745

Kartal, G. (2023). Contemporary language teaching and learning with ChatGPT. *Contemporary Research in Language and Linguistics, 1*(1), 59–70. https://orcid.org/0000-0003-4656-2108

Kasneci, E., Seßler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., ... & Kasneci, G. (2023). ChatGPT for good? On opportunities and challenges of large language models for education. *Learning and Individual Differences, 103*,1–9. https://doi.org/10.1016/j.lindif.2023.102274

| | Teaching English as a Second Language Quarterly (TESLQ) (Formerly Journal of Teaching Language Skills) | **76** |
| TESL Quarterly | 43(2), Spring 2024, pp. 49-85 | **Masoud Azadnia** |

CHATGPT-ASSISTED LANGUAGE LEARNING AND TEACHING

Kim, S., Shim, J., & Shim, J. (2023). A study on the utilization of OpenAI ChatGPT as a second language learning tool. *Journal of Multimedia Information System*, *10*(1), 79–88. https://doi.org/10.33851/JMIS.2023.10.1.79

Kohnke, L., Moorhouse, B.L., Zou, D. (2023). ChatGPT for language learning and teaching. *RELC Journal*, *54*(2), 537–550. https://doi.org/10.1177/003368822311628

Kostka, I., & Toncelli, R. (2023). Exploring applications of ChatGPT to English language teaching: Opportunities, challenges, and recommendations. *The Electronic Journal for English as a Second Language, 27*(3), 1–15. https://doi.org/10.55593/ej.27107int

Korpershoek, H., Harms, T., de Boer, H., van Kuijk, M., & Doolaard, S. (2016). A meta-analysis of the effects of classroom management strategies and classroom management programs on students' academic, behavioral, emotional, and motivational outcomes. *Review of Educational Research*, *86*, 643–680. https://doi.org/10.3102/0034654315626799

Li, B., Kou, X., & Bonk. C. J. (2023). Embracing the disrupted language teaching and learning field: Analyzing YouTube content creation related to ChatGPT. *Languages*, *8*(197), 1–18. https://doi.org/10.3390/languages8030197

Lim, W. M., Gunasekara, A., Pallant, J. L., Pallant, J. I., Pechenkina, E. (2023). Generative AI and the future of education: Ragnarök or reformation? A paradoxical perspective from management educators. *The International Journal of Management Education*, *21*(2), 1–13. https://doi.org/10.1016/j.ijme.2023.100790

Liu, B. (2023). Chinese university students' attitudes and perceptions in learning English using ChatGPT. *International Journal of Education and Humanities (IJEH)*, *3*(2), 132–140. https://doi.org/10.58557/(ijeh).v3i2.145

Liu, G., & Ma, C. (2023). Measuring EFL learners' use of ChatGPT in informal digital learning of English based on the technology acceptance model. *Innovation in Language Learning and Teaching*, 1–14. https://doi.org/1-14. 10.1080/17501229.2023.2240316

Lo, C. K. (2023). What is the impact of ChatGPT on education? A rapid review of the literature. *Education Sciences*, 13(4), 1–15. https://doi.org/10.3390/educsci13040410

Lund, B. D., Wang, T., Mannuru, N. R., Nie, B., Shimray, S., & Wang, Z. (2023). ChatGPT and a new academic reality: Artificial Intelligence-written research papers and the ethics of the large language models in scholarly publishing. *Journal of the Association fo Information Science and Technology*, *74*(5), 570–581. https://doi.org/10.1002/asi.24750

McCarthy, J. (2007). *What is Artificial Intelligence?* Stanford University.

Mohamed A. M. Exploring the potential of an AI-based Chatbot (ChatGPT) in enhancing English as a Foreign Language (EFL) teaching: perceptions of EFL faculty members. *Education and Information Technologies*. Advance online publication. https://doi.org/10.1007/s10639-023-11917-z

Moqbel, M. S. & Al-Kadi, A. (2023). Foreign language learning assessment in the age of ChatGPT: A theoretical account. *Journal of English Studies in Arabia Felix*, *2*(1), 71–84. https://doi.org/10.56540/jesaf.v2i1.62

Munn, Z., Peters, M. D. J., Stern, C., Tufanaru, C., McArthur, A., & Aromataris, E. (2018). Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review. *BMC Medical Research Methodology*, *18*(143), 1-7. https://doi.org/10.1186/s12874-018-0611-x

	Teaching English as a Second Language Quarterly (TESLQ) (Formerly Journal of Teaching Language Skills) 43(2), Spring 2024, pp. 49-85	**77**
		Masoud Azadnia

CHATGPT-ASSISTED LANGUAGE LEARNING AND TEACHING

Nguyen, T. T. H. (2023). EFL teachers' perspectives toward the use of ChatGPT in writing classes: A case study at Van Lang University. *International Journal of Language Instruction*, 2(3), 1–47. https://doi.org/10.54855/ijli.23231

Rudolph, J., Tan, S., & Tan, S. (2023). ChatGPT: Bullshit spewer or the end of traditional assessments in higher education?. *Journal of Applied Learning and Teaching*, 6(1), 342–363.

Shaikh, S., Yayilgan, S. Y., Klimova, B., & Pikhart, M. (2023). Assessing the usability of ChatGPT for formal English language learning. *European Journal of Investigating Health, Psychology and Education*, *13*, 1937–1960. https://doi.org/ 10.3390/ejihpe13090140

Tlili, A., Shehata, B., Adarkwah, M.A., Bozkurt, A., Hickey, D.T., Huang, R., & Agyemang, B. (2023). What is the devil is my guardian angel: ChatGPT as a case study of using chatbots in education. *Smart Learning Environments, 10*, 1–24. https://doi.org/10.1186/s40561023-00237-x

Tricco, A.C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., Moher, D., Peters, M. D., Horsley, T., Weeks, L., Hempel, S. et al. (2018). PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Ann Intern Med.*, *169*(7),467–473. https://doi.org/10.7326/M18-0850.

Ulla, M. B., Perales, W. F., & Busbus, S, O. (2023). To generate or stop generating response': Exploring EFL teachers' perspectives on ChatGPT in English language teaching in Thailand. *Learning, Research and Practice*, *9*(2), 168–182. https://doi.org/10.1080/23735082.2023.2257252

Xiao, Y., & Zhi. Y. (2023). An exploratory study of EFL learners' use of ChatGPT for language learning tasks: Experience and perceptions. *Languages*, *8*(212), 1–12. https://doi.org/ 10.3390/languages8030212

Yan, D. (2023). Impact of ChatGPT on learners in an L2 writing practicum: An exploratory investigation. *Education and Information Technologies*, *28*(11),1–25. https://doi.org/ 10.1007/s10639-023-11742-4

Appendix A

Tabulated Outline of the Review Sample

Title	Journal	Setting	Objective(s)	Participants /Corpora	Design	Research Focus
Agustini, 2023	EDUKASIA	Indonesian EFL Context	To explore how the integration of ChatGPT into a language learning program promotes learning autonomy	Six senior high school students enrolled in the KBM program	Mixed Method Study	EFL Learning Autonomy
Algaraady & Mahyoob, 2023	AWEJ	Arab EFL Context	To investigate the comparative efficacy of the ChatGPT in spotting and analyzing writing errors	Instructor- and ChatGPT-generated comments on texts written by 88 university students	Comparative Corpus-based Research	EFL Writing
Ali et al., 2023	Journal of English Studies in Arabia Felix	International EFL Context	To explore ChatGPT's impact on students' writing motivation	42 EFL teachers and 38 EFL students	Descriptive Survey Study (quantitative)	EFL Learning Motivation
Athanassopoulos et al., 2023	Advances in Mobile Learning Educational Research	Greek GFL (German as a foreign language learning) context	To explore the efficacy of ChatGPT in improving foreign language writing	Eight students with a migrant/refugee background in a Greek Junior High School	Quasi-experimental Study	L2 Writing
Baskara, 2023	International Journal of Education and Learning	N/A	To explore the potential benefits and challenges of using ChatGPT in EFL writing instruction	N/A	Literature Review	EFL Writing
Baskara & Mukarto, 2023	Indonesian Journal of English Language Teaching and Applied Linguistics	N/A	To explore the potential implications of ChatGPT for language learning in higher education	N/A	Multi-disciplinary Literature Review	L2/FL Language Learning in Higher Education
Bin-Hady et al., 2023	Library Hi Tech.	International ESL Context	To establish a model for ChatGPT's efficacy in English language learning	20 Researchers involved in language learning research	Grounded Theory (GT)	English Language Learning

Title	Journal	Setting	Objective(s)	Participant(s) /Corpus(es)	Design	Research Focus
Faiz et al., 2023	Linguistic Forum	Pakistanis EFL Context	To address the intricate relationship between the use of ChatGPT and autonomous writing	50 male and female Intermediate-Level EFL learners	Mixed-Methods Study	EFL Writing
Guo & Wang, 2023	Education and Information Technologies	Chinese EFL Context	To examine the possible role of ChatGPT in facilitating the teaching and learning of EFL writing	• Fifty English argumentative essays composed by undergraduate students • Five EFL teachers	Comparative Descriptive Study	EFL Writing
Haggag, 2023	Journal of the Faculty of Education in Assiut	Egyptian EFL Context	To explore the efficacy of ChatGPT in improving EFL descriptive writing skills and grammar use	30 third-year EFL majors	One-group Quasi-experimental	• EFL Writing • EFL Grammar Use
Han et al., 2023	The Journal of Computer Science	South-Korean EFL Context	To investigate students' perception and usage of ChatGPT in EFL writing courses	• 213 graduate and undergraduate college students • Seven EFL instructors	Experimental (pre- and Post-survey) Study	EFL Writing
Harunasari, 2023	IJPSAT	Indonesian EFL Context	To investigate effective and responsible strategies for incorporating ChatGPT into EFL writing	16 undergraduate EFL students from a private foreign language institute	One-shot Case Study	EFL Writing
Hong, 2023	Journal of Educational Technology and Innovation	N/A	To conduct an in-depth discussion of how the chatbot can be harnessed by those involved in L2/FL pedagogy	N/A	Literature Review	FL Learning and Teaching
Javier & Moorhouse, 2023	TESOL Journal	Filipino ESL Context	To investigate how to promote secondary school ESL learners' critical and productive use of ChatGPT	An intact class including 49 intermediate ESL learners	Action Research (Practitioner Research)	ESL Learning and Teaching

Title	Journal	Setting	Objective(s)	Participant(s) /Corpus(es)	Design	Research Focus
Kartal, 2023	Contemporary Research in Language and Linguistics	N/A	To explore the affordances and challenges of ChatGPT in the language learning context	N/A	Literature Review	L2/FL Learning
Kim et al., 2023	Journal of Multimedia Information System	South Korean EFL Context	To explore the feasibility and suitability of ChatGPT as an ESL learning tool	A virtual learner with a pre-determined persona	Case Study	L2 Learning and Teaching
Kohnke et al., 2023	RELC Journal	N/A	To explore the affordances of ChatGPT for language teaching and learning	N/A	Technology Review	L2/FL Learning and Teaching
Kostka & Toncelli, 2023	The Electronic Journal for English as a Second Language	N/A	To elaborate on the role of ChatGPT in English Language Teaching (ELT)	N/A	Literature Review	ELT
Li et al., 2023	Languages	International Language Learning Context	To investigate YouTubers' discussions of ChatGPT for language learning/teaching	140 systematically chosen videos on YouTube	Mixed-Methods Netnography	L2/FL Learning
Liu & Ma, 2023	Innovation in Language Learning and Teaching	Chinese EFL Context	To conceptualize EFL learners' perception and use of ChatGPT in informal digital English learning	405 Chinese male and female EFL learners	Quantitative Cross-Sectional Study	Informal Digital English Learning
Liu, 2023	IJEH	Chinese EFL Context	To assess EFL students' attitudes towards using ChatGPT for English learning improvement	109 undergraduate students (53.21% female and male 46.79%)	Descriptive Survey Research (quantitative)	EFL Learning
Mohamed, 2023	Education and Information Technologies	A Saudi Arabian EFL Context	To investigate ChatGPT's efficacy in supporting EFL learning	Ten EFL faculty members	Descriptive Survey Research (qualitative)	EFL Learning and Teaching

Title	Journal	Setting	Objective(s)	Participant(s) /Corpus(es)	Design	Research Focus
Moqbel & Al-Kadi, 2023	Journal of English Studies in Arabia Felix	N/A	To discuss the theoretical underpinnings of language learning assessments in the age of ChatGPT	N/A	Literature Review	L2 Learning Assessment
Nguyen, 2023	International Journal of Language Instruction	A Vietnamese EFL Context	To explore EFL teachers' thoughts on integrating ChatGPT into writing sessions	20 Vietnamese EFL teachers at Van Lang University	Mixed Methods Research	EFL Writing
Shaikh et al., 2023	European Journal of Investigating Health, Psychology and Education	A Norwegian EFL Context	To assess the usability of ChatGPT for formal English language learning	10 university students of different proficiency levels and nationalities	Survey-based Exploratory Study	Formal English Language Learning
Ulla et al., 2023	Learning, Research and Practice	A Thai EFL Context	To investigate EFL teachers' perception of ChatGPT as a language teaching tool	17 EFL teachers	Descriptive Survey Research (qualitative)	EFL Teaching
Xiao & Zhi, 2023	Languages	Chinese EFL Context	To investigate students' perceptions of Chat-GPT use in language learning	Five EFL students at a top-tier international university in China	Descriptive Survey Research (qualitative)	EFL Learning
Yan, 2023	Education and Information Technologies	Chinese EFL Context	To investigate the efficacy of a ChatGPT-assisted L2 writing practicum	35 undergraduate EFL majors	Multi-Method Qualitative Study	EFL Writing

	Teaching English as a Second Language Quarterly (TESLQ) (Formerly Journal of Teaching Language Skills) 43(2), Spring 2024, pp. 49-85	**82** Masoud Azadnia

CHATGPT-ASSISTED LANGUAGE LEARNING AND TEACHING

Appendix B

Thematic Analysis Results

Table B1

Codes Related to the Secondary Research Reviewed

Consequence		Case	Study
Favorable Outcomes	Learning Outcomes	Fostering language writing skills (planning, outlining, developing, and editing)	Baskara, 2023 Hong, 2023 Kartal, 2023 Kostka & Toncelli, 2023
		Enhancing teaching practice efficacy (creating lesson plans, instructional materials, and quizzes/tests suited to learners' specific needs/preferences)	Baskara & Mukarto, 2023 Kostka & Toncelli, 2023
		Fostering reading and comprehension skills in higher education	Baskara & Mukarto, 2023 Kartal, 2023
		Promoting contextualized vocabulary learning	Kartal, 2023 Kostka & Toncelli, 2023
		Improving language pronunciation	Kartal, 2023
		Enhancing language learning practice	Hong, 2023 Kohnke et al., 2023
	Pedagogical Outcomes	• Facilitating flipped language teaching materialization • Providing tutorial language instruction and supervision	Hong, 2023 Kostka & Toncelli, 2023
		Causing a shift from quantitative product-based to mixed (qualitative and quantitative) product and process-based language learning assessment	Moqbel & Al-kadi, 2023
	Affective/Cognitive Outcomes	Fostering critical thinking skills	Kartal, 2023 Kostka & Toncelli, 2023
		Cultivating self-reflection and self-assessment skills	Moqbel & Al-kadi, 2023
		Promoting active engagement in language learning	Baskara, 2023 Kohnke et al., 2023 Moqbel & Al-kadi, 2023
		Enhancing motivation for writing skills development	Baskara, 2023
Repercussions	Ethical Issues	Concerns about privacy violation	Baskara, 2023 Kostka & Toncelli, 2023
		Concerns about plagiarism and threats to academic integrity	Kartal, 2023 Kohnke et al., 2023 Kostka & Toncelli, 2023
		The possibility of mass unemployment in the global teacher community	Baskara & Mukarto, 2023
	Executive & Concerns Technical	The possibility of contextually inaccurate, biased, invalid, or unreliable output	Baskara, 2023 Baskara & Mukarto, 2023 Kartal, 2023 Kohnke et al., 2023 Kostka & Toncelli, 2023
		Flawed processing of abstract/complex concepts	Baskara & Mukarto, 2023
		Cultural bias and insensitivity	Kartal., 2023 Kohnke et al., 2023
		The absence of integral aspects of human-like understanding and communication	Kartal., 2023
		The suitability and usability of the content depend upon factors such as digital literacy and knowledge of ChatGPT's affordances and limitations	Kohnke et al., 2023
		Over-reliance on ChatGPT's output	Kostka & Toncelli, 2023 Moqbel & Al-kadi, 2023

Table B2

Codes Related to the Non-intervention Primary Research Reviewed

	Case	Study
Learning Outcomes	• Developing a diversity of language learning skills • Facilitating continuous and limitless language learning	Bin-Hady et al., 202
	Developing reading and writing (planning, outlining, developing, and editing) skills in informal settings	Liu & Ma., 2023
	Improving syntax/grammar knowledge	Ulla et al., 2023
	Developing reading and writing skills in formal instructional settings	Liu, 2023 Li et al., 2023 Ulla et al., 2023
	Improving the chance of learner-centered language learning (by promoting learners' engagement)	Mohamed, 2023 Ulla et al., 2023
Pedagogical Outcomes	Facilitating time/energy-saving, needs-driven instruction	Nguyen, 2023 Li et al., 2023
	Consolidating teachers' position	Bin-Hady et al., 202
	• Promoting purposeful teacher-student interaction • Enhancing teaching practice efficacy (creating lesson plans, instructional materials, and quizzes/tests suited to learners' specific needs/preferences)	Ulla et al., 2023
	Providing tutorial language instruction and supervision	Xiao & Zhi., 2023
Affective/Cognitive Outcomes	Cultivating self-reflection and self-assessment skills	Agustini, 2023
	Developing problem-solving skills	Liu, 2023
	Cultivating cultural awareness in informal digital settings	Liu & Ma., 2023
	Promoting self-directed (autonomous) language learning	Agustini, 2023 Bin-Hady et al., 202 Liu, 2023
	Facilitating language learning among learners of specific learning needs	Li et al., 2023
	• Enhancing teachers' digital literacy • Maximizing writing creativity and innovation	Nguyen, 2023
	Fostering critical thinking skills	Xiao & Zhi., 2023
	Developing attentiveness and observation skills	Li et al., 2023
	Enhancing motivation for language skills development	Ali et al., 2023 Li et al., 2023 Mohamed, 2023 Nguyen, 2023
	Enhancing motivation for autonomous learning	Ali et al., 2023
	Promoting learning pleasure and enjoyment	Liu, 2023 Li et al., 2023
	Enhancing motivation and enthusiasm for beyond-class language learning	Liu, 2023
	Enhancing learning confidence	Mohamed, 2023 Nguyen, 2023
	Offering support and encouragement while learning	Mohamed, 2023
	Enhancing comfort in language learning	Li et al., 2023
Ethical Concerns	Concerns about plagiarism and threats to academic integrity	Li et al., 2023 Liu, 2023 Mohamed, 202 Nguyen, 2023 Ulla et al., 2023 Xiao & Zhi, 2023
	Concerns about privacy violations (Personal information leakage)	Li et al., 2023 Liu, 2023 Mohamed, 2023
Technical Concerns	The possibility of contextually inaccurate, biased, invalid, or unreliable output	Agustini, 2023 Li et al., 2023 Liu, 2023 Mohamed, 2023 Ulla et al., 2023
	The suitability and usability of the content is dependent upon factors (e.g., learner proficiency, teaching experience, and knowledge of ChatGPT's affordances and limitations)	Agustini, 2023 Ali et al., 2023
	Cultural bias and insensitivity	Mohamed, 2023 Li et al., 2023

	Teaching English as a Second Language Quarterly (TESLQ) (Formerly Journal of Teaching Language Skills) 43(2), Spring 2024, pp. 49-85	**84**
		Masoud Azadnia

CHATGPT-ASSISTED LANGUAGE LEARNING AND TEACHING

Table B3

Codes Related to the Intervention-based Primary Research Reviewed

Type			Case	Study
Favorable Outcome	Learning Outcomes		Fostering/Enhancing language writing skills (Planning, outlining, developing, and editing)	Haggag, 2023; Han et al., 2023; Harunasari, 2023 Shaikh et al., 2023 Yan, 2023
			Enhancing writing quality (grammatical accuracy, lexical richness, composition structure)	Faiz et al., 2023
			Helping learners from multicultural and multilingual communities improve in writing quality (uniqueness) and quantity (length)	Athanasspoulos et al., 2023
			Fostering productive language learning in a conversational setting	Javier & Moorhouse, 2023
			Creating a natural immersion atmosphere for language learning	Kim et al., 2023
			Fostering multiple language learning skills (conversation, writing, grammar, and vocabulary) in formal language learning settings	Shaikh et al., 2023
	Pedagogical Outcomes		Assisting teachers in providing detailed and comprehensive lists of corrective feedback on surface-level writing errors	Guo & Wang, 2023 Algaraady & Mahyoob, 2023
			Facilitating TBLT content design and instruction facilitation	Kim et al., 2023
			Assisting formal language teaching	Shaikh et al., 2023
			Facilitating flipped language teaching materialization	Yan, 2023
	Affective/Cognitive Constructs		Raising learner awareness of productive and critical use of ChatGPT for language learning purposes	Javier & Moorhouse, 2023
			Enabling learners to strike a balance between ChatGPT's assistance and cultivating autonomous writing competencies	Faiz et al., 2023 Javier & Moorhouse, 2023
			Fostering critical thinking skills	Harunasari, 2023 Javier & Moorhouse, 2023
			Enhancing learners' self-esteem (receiving praise and encouragement in ChatGPT-generated feedback and suggestions)	Guo & Wang, 2023
			• Enhancing pleasure and comfort in learning • Enhancing motivation for language learning	Shaikh et al., 2023
Repercussions	Ethical Issues		Concerns about plagiarism and threats to academic integrity	Yan et al., 2023
	Design &		The contingency between the efficacy of ChatGPT-assisted language learning and learners' proficiency and awareness of LLMs' affordances/limitations	Faiz et al., 2023 Han et al., 2023 Harunasari, 2023

Type	Case	Study
	Challenges with comprehending, locating, and verifying ChatGPT-generated lengthy comments	Guo & Wang, 2023
	• Difficulties in accessing chat history data • Distractions emerging while using ChatGPT	Harunasari, 2023
	Cultural bias and insensitivity	Kim et al., 2023
	Unsuitability for practicing speaking and listening	Shaikh et al., 2023 Kim et al., 2023
	Incapability in producing human-like nuanced and detailed feedback	Algaraady & Mahyoob, 2023 Kim et al., 2023
	Over-reliance on ChatGPT's output	Harunasari, 2023