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Spanish language learning in the AI era: AI as a scaffolding tool

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Abstract: This study investigated how ten Chinese university students interacted with ChatGPT to facilitate their acquisition of Spanish as a second language. In a semi-informal educational setting, 370 ChatGPT prompts authored by the students and the AI-generated responses they yielded were collected over the course of one week. Secondary data sources included questionnaires and learning diaries. Findings revealed that students primarily sought assistance from ChatGPT with vocabulary acquisition, reading comprehension, and written expression, with fewer prompts focused on grammar or oral communication. The prompts showed significant variation in length, language preference, and pattern, though only a small portion involved more than a single prompt-response interaction. This trend suggests a largely task-oriented use of ChatGPT, with limited reflective engagement. This study points to the teacher ↔ AI ↔ learner relationship as a new dimension of interaction and offers practical recommendations for educators in AI-assisted language learning. Key suggestions include fostering students' self-directed learning abilities and encouraging more reflective and systematic learning approaches.

Keywords: AI-assisted language learning; Spanish as a second language (L2); AI-learner interaction; ChatGPT

1 Introduction

The use of AI has grown exponentially in recent years, especially since the free release to the general public by OpenAI of a new AI chatbot called ChatGPT on November 22, 2022. This generative AI application uses machine learning techniques to produce coherent and relevant responses to natural language requests or

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instructions, basing itself mostly on information that is publicly available on the internet (Aydın and Karaarslan 2023).

Rich language input, interaction, and feedback have long been considered key factors for successful language learning (Loewen and Sato 2017). Unlike other online learning platforms, ChatGPT when employed for language learning can meet these three key factors at the same time, by, for example, promoting vocabulary input accumulation, conducting conversational interactions, and providing feedback and evaluation. Although ChatGPT was not originally designed for this purpose, recent studies have started looking into how it can be used effectively in second language (L2) education, to provide, for instance, conversation practice, automated feedback, or writing assessment (Barrot 2024; Dai et al. 2023; Kohnke et al. 2023). To date, studies have confirmed that ChatGPT can play a potentially useful role in various aspects of L2 learning, by enhancing writing skills as a writing mediator, improving L2 vocabulary size, reducing students' reading anxiety, and improve the positivity of conversational engagement (Fathi and Rahimi 2024; Ibrahim Mugableh 2024; Liu and Reinders 2025; Tram et al. 2024).

Most current research, however, focuses primarily on quantifying the outcomes of L2 acquisition, usually emphasizing metrics such as vocabulary accumulation, writing coherence, or overall language proficiency improvement (Li et al. 2024b; Liang et al. 2021). There is still a significant research gap in exploring the qualitative aspects of learners' interactions with AI in the language learning process, in particular the specific content they are exposed to and whether these interactions result in effective language learning. In addition, most of the current research has focused on the acquisition of L2 English, with less research on other languages (Yang and Rui 2024). Our research will help to fill this gap with data from the context of L2 Spanish acquisition by young adult L1 Chinese learners. By analyzing how these students interact with ChatGPT to facilitate their learning of Spanish, this study hopes to obtain insights into the strengths and limitations of AI as an L2 learning tool. To this end, the following research questions (RQs) are posed:

RQ1: What are the specific L2 learning needs that students seek to address when they interact with ChatGPT?

RQ2: How do students interact with ChatGPT to meet these needs during the learning process?

2 AI and L2 learning

Technology-assisted language learning is no longer a novel concept, as the internet now offers abundant resources and tools for language acquisition. Recent AI advancements present new opportunities and challenges by providing personalized, interactive, and immersive learning environments through web-based platforms, virtual reality, and chatbots (Lin and Chang 2020; Wijekumar et al. 2013). In the field of AILEd (Artificial Intelligence in Language Education), researchers have mainly focused on the effectiveness of AI tools for various aspects of language learning, followed by the acceptance of these tools by teachers and students, as well as some of the ethical considerations that these practices entail (Li et al. 2024a; Liang et al. 2021).

Regarding L2 writing acquisition, Gayed et al. (2022) developed an AI-based web application (AI KAKU) aimed at helping adult learners of English as a foreign language (EFL) overcome cognitive barriers in writing. Preliminary results suggested that the application enabled students to write more fluidly and facilitated the composition process, indicating AI's potential for enhancing writing skills. Other research has explored the use of ChatGPT to assist L2 writing, especially in academic contexts. For instance, Fathi and Rahimi (2024) found that ChatGPT's mediation contributed substantially to the development of learners' academic writing skills, in part because they generated positive attitudes in them. Similarly, Yan (2023) showed that ChatGPT significantly improved the writing skills of EFL learners.

With regard to L2 reading, researchers in South Korea used an AI text generator (Copy AI) in three primary schools to create articles tailored to students' interests and abilities to improve their English. Teachers noted that students found AI-generated texts more engaging than traditional textbooks, suggesting that such resources could enhance reading interest among young learners (Lee et al. 2023). For their part, Hasballah and Nor (2024) examined the utility of AI apps at different points in the reading process; and found that ChatGPT was particularly useful during the pre-reading stage, QuillBot and Paraphraser.io offered advantages during the reading process itself, ChatGPT and Storywiz.io could be effectively utilized to generate post-reading activities. Looking at two different issues, Zheng (2024) found that using ChatGPT in reading could both reduce reading anxiety and improve foreign language reading performance.

In connection with oral communication, several studies have examined the use of AI chatbots to improve students' L2 conversation skills (Belda-Medina and Calvo-Ferrer 2022; Huang et al. 2022; Yang et al. 2022). Tai and Chen (2024) investigated the impact of a generative AI chatbot (CoolE Bot) on EFL learners' speaking skills, in an elementary school. The results showed that it effectively helped students to communicate in the L2 while enhancing their self-confidence and reducing their

anxiety about speaking English. Finally, Yang et al. (2022) also showed the positive potential of chatbots in facilitating spoken communication.

In addition to language acquisition, Liu and Ma (2023) used the Technology Acceptance Model to measure the attitudes, intentions, and behaviors of 405 English learners using ChatGPT. They found that positive attitudes toward ChatGPT's usefulness strongly predicted its actual use in English learning outside the classroom. Along somewhat similar lines, Li et al. (2024a) explored the integration of ChatGPT in self-directed learning (SDL), particularly in language learning, by analyzing YouTube content creators' experiences, and found that ChatGPT enhanced SDL because it personalized learning experiences.

However, despite these advancements, gaps remain in our understanding of the behavioral aspects of students' interactions with AI in L2 learning (Liang et al. 2021). Further research is needed about how students engage with AI tools and how these interactions can be effectively harnessed to foster autonomous language learning, an area that has been relatively underexplored in current studies.

3 Social constructivism theory

This study is grounded in Vygotsky's (1978) social constructivism theory, a theoretical framework which posits that cognitive development is largely a socially mediated process, where interaction with a more knowledgeable other can significantly enhance the learner's ability to acquire and internalize new cognitive skills. Through these interactions, learners gradually develop the capacity to perform tasks independently, a process known as the "zone of proximal development". Vygotsky (2012) emphasizes that the role of the more knowledgeable other is crucial in providing the necessary support or "scaffolding" that allows learners to bridge the gap between what they can achieve with guidance and what they can do independently.

In language education, peer collaboration and social interaction significantly enhance learners' language skills (Fathi et al. 2020). While social constructivism traditionally emphasizes human-human interaction, this framework can be extended to human-AI interactions, such as those between L2 learners and AI tools like ChatGPT. Designed to emulate human social interactions and based on Large Language Models that reflect previous social interactions, AI offers potential as a tool for L2 learning by providing real-time feedback and fostering collaborative engagement. Fathi and Rahimi's (2024) study demonstrates that ChatGPT, as a writing mediator, improves English learners' academic writing skills and supports their development within the Zone of Proximal Development (ZPD). Moreover, Vygotsky (2012) underscores the importance of social context in cognitive development, where interaction plays a key role. AI creates a supportive environment for learners to

experiment with language, make mistakes, and receive corrective feedback, aligning with Vygotsky's view that learning thrives through interaction and collaboration, even when mediated by AI.

Dynamic Assessment (DA), rooted in Vygotsky's theories, emphasizes learners' potential for future growth and development through the interaction of instruction and assessment (Lidz and Elliott 2000). In AI-assisted language learning, this approach aligns seamlessly with the generative AI like ChatGPT which acts as "more knowledgeable others" by providing real-time feedback, scaffolding, and personalized support. These interactions reflect the principles of DA by dynamically adjusting to learners' needs, fostering engagement, self-regulation, and progression within their Zone of Proximal Development (ZPD). This dynamic process extends Vygotsky's social constructivism by facilitating collaborative knowledge construction between the learner and the system, enabling the learner to surpass their current capabilities.

Furthermore, Vygotsky's constructivist perspective sheds light on the concept of self-regulation in the context of AI-assisted learning (Song and Song 2023). Li et al. (2024a) investigates how ChatGPT is integrated into self-directed language learning (SDLL) by examining the experiences of YouTube content creators. This study emphasizes ChatGPT's potential as a tool for enhancing SDLL. Such progression toward SDL, as facilitated by ChatGPT, is vital for fostering long-term language skill development and promoting independent learning.

4 Methods

In this study, a qualitative research approach was employed for both data collection and analysis to address the research questions. Two reasons support this choice: 1) a qualitative approach would allow for a more in-depth exploration of the participants' learning experiences and interactions with ChatGPT, which are complex and subjective in nature (Braun and Clarke 2013); and 2) there is no previous research about the specific ways in which learners interact with AI engines in the absence of teachers.

4.1 Context and participants

We adopted a purposive sampling method for selecting participants, with the following recruitment criteria: they had to 1) have Chinese as a mother tongue; 2) have at least a Common European Framework of Reference for Languages (CEFR) A2 proficiency level in L2 Spanish; 3) be enrolled in a master's or PhD program at a

Spanish university as of May 2023; and 4) have some user-level experience with and interest in digital technology.

Of the ten participants selected, eight were women and two were men, with ages ranging from 19 to 26 years. All had a CEFR B or C level command of L2 Spanish, good technological literacy. As can be seen in Table 1, these young individuals were multilingual speakers with extensive experience in technology-assisted autonomous

Table 1: Demographic data for participants.

Participant	Age	Gender	Field of study	Spanish proficiency level (CEFR)	Digital self-learning tools familiar with	Learning goals
P1	19	F	Marketing	B1	Spanish assistant; Spanish listening assistant	Improve L2 skills in general
P2	20	F	Marketing	B2	Spanish assistant	Prepare for the DELE exam
P3	21	M	Marketing	B1	Podcast; Don quijote news;	Help with L2 essay writing
P4	24	F	Economics	B2	Spanish assistant; Youtube; Spotify	Prepare for the DELE exam
P5	23	F	Media studies	B2	Spanish assistant	Prepare for the DELE exam
P6	23	F	Spanish literature	C1	Spanish assistant	Improve L2 skills in general
P7	22	M	Spanish literature	C1	Spanish assistant	Improve L2 skills in general
P8	22	F	Digital humanities	C1	MoMo Memorizar; Spanish listening assistant	Prepare for the DELE exam
P9	24	F	Latin American studies	C1	Spanish listening assistant; Youtube	Help with L2 essay writing
P10	26	F	Language education	B2	Spanish listening assistant	Improve L2 skills in general

Spanish Assistant is an online Spanish dictionary. *Spanish Listening Assistant* is a Chinese app for listening practice in Spanish. *Don Quijote News* is an app for students to watch Spanish news. *MoMo Memorizar* is a Chinese app to help students learn vocabulary. The *DELE* (Diploma de Español como Lengua Extranjera) is an official diploma certifying the bearer's level of proficiency in L2 Spanish; it is awarded by the Instituto Cervantes on behalf of the Spanish government.

language learning. All were pursuing higher education in Spain with the goal of improving their Spanish language proficiency.

During the study period, participants uniformly utilized ChatGPT-3.5, which was the most advanced and freely accessible AI tool available at the time (May 2023), as other AI tools such as Copilot had not yet gained widespread adoption.

4.2 Instruments

To enhance the reliability and credibility of the study, data were collected from three different sources: text interactions between students and ChatGPT, student learning diaries, and qualitative questionnaires. All three kinds of data were triangulated utilizing multiple methods.

(1) Chat logs: At the end of each study day, participants were instructed to copy and paste their complete ChatGPT chat logs into a shared Google Docs file. Participants could use whichever language they were comfortable with (Chinese, Spanish, or English) to give prompts to ChatGPT. A total of 383 prompts were recorded, of which 13 were discarded for irrelevance, leaving us with 370 prompts for analysis.

(2) Learning diaries: Each participant was required to complete an online learning diary over the course of a week, with three sections: 1) the content they were endeavoring to learn, 2) the assistance provided by ChatGPT, and 3) any difficulties encountered while using the AI tool. All participants completed their diaries in Chinese. The average word count of each participant's diary was 502.7 words, with the longest diary containing 933 words and the shortest having 135 words.

(3) Qualitative questionnaires: Each participant answered an online qualitative questionnaire in Chinese with 14 questions, divided into three sections: personal information, the process of using ChatGPT, and learning experiences with ChatGPT. These questions were inspired by previous research and responded to our research questions. All these data were collected by Questionnaire Star (a Chinese questionnaire platform).

4.3 Data collection and analysis

The data collection process was conducted in three phases: First, during the preparatory phase, participants received a ChatGPT study guide (Mena et al. 2023). This guide explains the basics of ChatGPT, provides examples of language learning (vocabulary, grammar, reading, translation, writing and speaking) and ensures that

all participants had a minimum of information about AI for our study. However, students were not required to adhere to these guidelines when crafting their prompts. The guide was provided in both Spanish and Chinese.

In the second phase, students were required to spend at least 30 min daily for seven days using ChatGPT to learn Spanish. They could use ChatGPT at any location and at any time. Finally, in the third phase, after the seven-day period, students were asked to complete the questionnaire, which was distributed via WeChat.

We analyzed the chat logs and learning diaries using content analysis, a flexible qualitative method which is useful for examining trends and patterns in different documents (Krippendorff 2018). To ensure data reliability, the article's first author collaborated with another coder who was also a native speaker of Chinese to verify coding accuracy, employing triangulation to cross-check data from the three sources.

First, working independently, two coders reviewed the chat logs, identifying key features related to participants' learning needs and interaction behaviors with ChatGPT. These features were compiled into an initial coding framework. Secondly, the two coders compared their coding frameworks and discussed any discrepancies. Through collaborative discussion, they reconciled differences and refined the coding categories, ensuring consistency in the analysis. Once a consolidated coding scheme was developed, they applied it independently to the full dataset, coding the material according to the agreed categories. Finally, they triangulated the data from the learning journals and questionnaires with the chat logs.

To enhance transparency, Table 2 presents three examples of the final coding scheme, illustrating how specific prompts were categorized under different learning needs, languages and interaction patterns. Additionally, each section of the results provides further explanations of how the coding scheme was implemented in analyzing participants' interactions with ChatGPT. This systematic approach ensures the rigor of the qualitative analysis and facilitates a clear understanding of how the data were interpreted.

Table 2: Example of coding scheme.

Code	Subcode	Definition	Original prompt
Learning needs	Vocabulary	Seeking explanations for the meaning of individual words	***Colchoneta*** 是什么意思? (What does ***Colchoneta*** mean?)
Language used in their prompts	Chinese	Asking ChatGPT in Chinese	西班牙语中表示方位的有哪些词汇? (What vocabulary words indicate direction or location in Spanish?)
Interaction pattern	Simple interaction	Only one prompt with its response	Prompt: What does ***indexable*** mean? ChatGPT: [explanation]

5 Results

This section presents findings primarily derived from chat logs, with questionnaires and learning diaries serving as supplementary sources. These results shed light on participants' learning needs, learning process, and interaction behaviors with ChatGPT. An analysis of chat logs revealed that on average the ten participants gave 37 prompts to the AI tool in the course of the seven-day period. Participant 7 demonstrated the highest level of engagement with 79 prompts, while Participant 8 submitted the fewest at 16. This disparity highlights significant variation in ChatGPT usage, with Participant 7 submitting nearly five times as many prompts as Participant 8.

5.1 The learning needs of participants

Based on the keywords contained in the prompts and the implicit purposes within them, the students' learning needs were classified into six categories according to skills (reception/production), mode (written/oral), or verbal components (vocabulary/grammar/discourse):

1. Mastering vocabulary and idioms (e.g., participant asked ChatGPT for an explanation).
2. Understanding written content (e.g., participant asked ChatGPT for an explanation or summary of sentences or / and passages).
3. Producing written content (e.g., participant asked ChatGPT to translate or generate a text).
4. Mastering grammar and discourse features (e.g., participant asked ChatGPT for an explanation).
5. Mastering oral expression (e.g., participant asked ChatGPT to prepare a draft for an oral task).
6. Creating a study plan and obtaining miscellaneous advice.

Figure 1 presents the distribution of prompts based on these six categories. The most frequent was mastering vocabulary and idioms (134 prompts). This suggests that students relied heavily on ChatGPT to clarify word meanings and idiomatic expressions, indicating that vocabulary building was a central focus of their language learning efforts.

Following closely was understanding written content (99) and producing written content (98). These figures suggest that students frequently used ChatGPT for both comprehension and production tasks, which aligns with ChatGPT's strengths in generating text and assisting with understanding written materials.

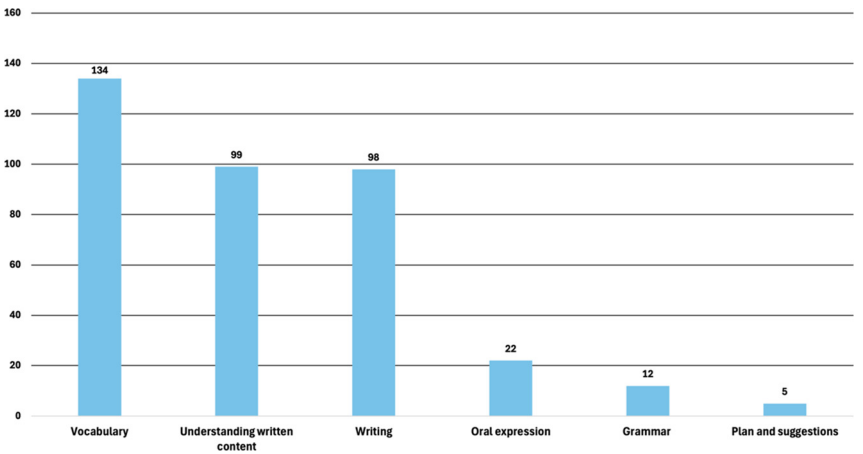

Figure 1: Distribution of prompts by learning needs.

In contrast, the category of oral expression accounted for only 22 prompts, while the need to learn grammar and discourse features elicited 12 prompts. These lower numbers might reflect a tendency for students to focus more on tangible tasks like vocabulary and writing, while relying less on ChatGPT for grammar clarification or practicing speaking skills. In other words, they tended to focus on completing immediate academic or communicative tasks rather than reflecting on the structure of the language.

Additionally, one participant (P9) was found to frequently use ChatGPT to develop study plans and seek general advice (5), as demonstrated in the prompt "How can I write an excellent master's thesis in Spanish?"

Notably, among all 370 prompts, no requests were related to the comprehension of oral content, likely reflecting the capabilities – or limitations – of the ChatGPT-3.5 model at the time.

Figure 2 displays the distribution of prompts submitted by each participant in the six key categories, showing a wide range of preferences in interaction with AI and very different language learning strategies. Writing and vocabulary-related prompts are the most widely distributed among participants, indicating that these areas are common focal points for most learners. In contrast, oral expression prompts are the least represented across participants, suggesting perhaps that Chinese students place relatively little emphasis on improving oral communication skills.

It will be seen that most students generated prompts across three or four of the six categories. However, there were exceptions:

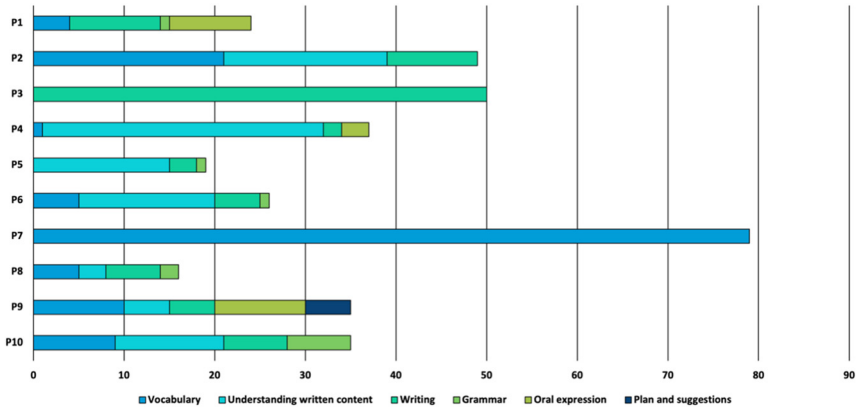

Figure 2: Distribution of prompts across different learning needs for each participant.

- P9 created prompts for five categories. This points to a multifaceted and reflective learning strategy, where ChatGPT is utilized not only for specific language tasks but also for self-directed learning tasks, such as planning and seeking guidance on academic goals. This suggests a sophisticated approach to leveraging ChatGPT for diverse needs, making it a dynamic partner in the learning process.
- P7 focused narrowly on mastering vocabulary and idioms, far exceeding the number of prompts in this category produced by the other participants. This aligns with his comment in the follow-up questionnaire that he usually studies independently using textbooks and only used ChatGPT as a tool for looking up vocabulary.
- P3 used the highest number of prompts for generating written content, reflecting a preference for written tasks. This is related to his learning objective, which was primarily to complete academic papers.

Taken as a whole, these data reveal a wide range of ChatGPT usages among students, from those who use it for a single, specific purpose (i.e., monothematic learners) to those who employ it flexibly across multiple subjects and tasks.

5.2 How participants learn with ChatGPT

This section presents a detailed analysis of the specific behaviors exhibited by students during their Spanish learning process with ChatGPT, structured around the six categories identified in the previous section.

5.2.1 Mastering vocabulary and idioms

As illustrated in Table 3, participants used four types of prompts to learn vocabulary: 1) the most common prompts involved asking for the meaning of a single word (e.g. E1); 2) participants also engaged in reflective learning by comparing different words to enhance their understanding (E2); 3) participants occasionally used ChatGPT to request summaries of specific types of Spanish vocabulary (E3); and 4) participants often used follow-up prompts to obtain more precise explanations and achieve a deeper understanding. For example, in E4 a student initially struggles to understand ChatGPT's explanation in Spanish, so they request a follow-up explanation in Chinese. Similarly, in E5 P7 seeks a deeper understanding comprehension of the word *colchoneta* ('exercise pad') by not only asking for examples but also requesting related vocabulary.

Typically, these prompts were relatively simple and very short, usually no longer than ten characters. Some participants wrote their prompts in Spanish while others used Chinese or even a mixture of the two languages, and ChatGPT responded according to the language of the prompt.

These instances illustrate ChatGPT's flexibility and adaptability in supporting vocabulary comprehension. P2 noted in her learning diary:

> ChatGPT's explanations of words are clear and easy to understand, helping me grasp the meanings of certain phrases, and the example sentences it provided were very helpful.

Table 3: Examples of prompts for learning vocabulary and idioms through ChatGPT.

Example	Original prompt	Translation
E1 (P2)	que significa ***indexable***	What does ***indexable*** mean?
E2 (P1)	What is the difference between ***tanto*** and ***mucho***	
E3 (P8)	西班牙语中表示方位的有哪些词汇?	What are the words for directions in Spanish?
E4 (P2)	Prompt 1: que significa ***indexable*** ChatGPT: [explanation] Prompt 2: y en chino? Como se dice? ChatGPT: [explanation]	Prompt 1: What does ***indexable*** mean ChatGPT: [explanation] Prompt 2: and in Chinese? How do you say it? ChatGPT: [explanation]
E5 (P7)	Prompt 1: ***Colchoneta*** 是什么意思? Prompt 2: 举个例子 Prompt 3: 跟它相关的词汇有哪些?	Prompt 1: What does ***colchoneta*** mean? Prompt 2: For example. Prompt 3: What are the words related to it?

The prompts written in Chinese and Spanish have been translated into English, while specific query content has been retained in its original Spanish form in boldface.

Students' prompts could also be as simple as single words. Thanks to ChatGPT's memory capabilities, which allow it to retain context from previous conversations, participants did not need to repeatedly request; they could simply enter the desired word, and ChatGPT would automatically provide explanations, examples, and related vocabulary. Additionally, ChatGPT can decipher incomplete or inaccurately structured prompts and provide satisfactory feedback. For instance, P2's Spanish prompt should have been phrased *¿Qué significa "indexable"?* However, the participant omitted the acute accent on "que," did not enclose the target word in quotation marks and failed to use question marks. Despite these errors, ChatGPT was able to interpret the intended meaning accurately.

5.2.2 Understanding written content

ChatGPT often served as a tool for bridging the gap between literal translations and a deeper understanding of idiomatic expressions. As seen in Table 4 above, participants frequently used ChatGPT to clarify unfamiliar sentences or expressions. In E6, the prompt is framed in English, as is the AI response, but ChatGPT can also clarify in Chinese, as demonstrated in E7. Like their approach to vocabulary, some participants also requested additional examples for better understanding. P4 also noted in her diary:

> These idioms cannot be directly translated using translation software, but ChatGPT's explanations help me understand them correctly.

Table 4: Examples of prompts for understanding written content.

Example	Original prompt	Translation
E6 (P2)	quiero saber que significa: ***un error en una publicación es un pecado***	I want to know what ***un error en una publicación es un pecado*** means.
E7 (P4)	***Quemarse las pestañas*** 的中文什么意思	What does ***quemarse las pestañas*** mean in Chinese.
E8 (P10)	Prompt 1: qué significa ***trabajar con película inglesa***	Prompt 1: What does ***trabajar con película inglesa*** mean.
	Prompt 2: ok, te doy el contexto ahora: ***Al principio, siempre fingía rodar, para que se acostumbrasen y cobraran confianza, naturalidad. A eso lo llamaba trabajar con película inglesa.***	Prompt 2: ok, I'll give you the context now: ***Al principio, siempre fingía rodar, para que se acostumbrasen y cobraran confianza, naturalidad. A eso lo llamaba trabajar con película inglesa.***
E9 (P6)	***(an article)***请帮我总结一下这篇文章	***(an article)*** Please help me summarize this article.

Moreover, in E9 the participant asks ChatGPT to help summarize an entire passage. This indicates that beyond understanding specific phrases or expressions, some students used ChatGPT to process larger portions of text, potentially aiming for quick comprehension or to distill the essential meaning of more complex written content.

ChatGPT's ability to provide accurate explanations improves when context is provided. For instance, in E8, when no context was initially provided, ChatGPT's explanation was inaccurate. The participant then added context, which enabled ChatGPT to understand and provide a correct response. As observed in the previous section, even when participants' prompts were not perfectly structured, ChatGPT was still able to interpret their requests effectively.

5.2.3 Producing written content

As illustrated in Table 5, participants made extensive use of ChatGPT to generate various types of written content, ranging from formal emails to exam preparation tasks. To elicit such complex responses, significantly longer prompts were required. As these prompts involved realistic communicative contexts (such as a defined audience, purpose, and discourse genre), students often requested the generation of complete texts. Specifically, participants used ChatGPT for the following types of writing tasks:

(1) To translate sentences and phrases. For example, in E10 the participant requests a simple translation of an English sentence into Spanish. This illustrates how ChatGPT can be utilized for quick, direct translation needs, allowing students to receive immediate assistance with language output. By contrast, E11 involves a more complex prompt in which the participants assign ChatGPT a specific role. This suggests that students develop strategies to enhance the accuracy of ChatGPT's responses.
(2) To draft emails (E12). P10 mentioned in her diary that the writing templates provided by ChatGPT helped her better understand appropriate email format.
(3) For exam preparation and formal writing. In E13 a student requested assistance in generating written content for DELE exam preparation, providing highly detailed prompts with specific instructions regarding the content to be addressed in letters (one of the writing tasks on the exam). This illustrates how students can use ChatGPT as a tool to understand the structured requirements of formal writing tasks within an exam context.

Comparing E12 and E13, the prompt in E13 is generally more coherent and well-written, possibly because P4 copied and pasted it digitally from a textbook or sample exam rather than composing it spontaneously. Copying and pasting is a common technique employed by AI beginners to swiftly obtain answers tailored to their

Table 5: Examples of prompts for producing written content.

Example	Original prompt	Translation
E10 (P1)	Translate ***there are lots of changes with the company*** in Spanish.	
E11(P3)	您是一位西班牙语和中文双母语使用者,请帮一位学西班牙语的学生把以下句子从中文翻译为西班牙语,请确保表达用词地道:货物从中国工厂运输到巴塞罗那港口的总费用。	You are a bilingual Spanish and Chinese speaker. Please help a Spanish student translate the following sentence from Chinese to Spanish. Please make sure the expression is authentic: ***The total cost of transporting goods from the Chinese factory to the port of Barcelona.***
E12 (P3)	你是CEO的秘书,需要用西班牙语发邮件给酒店预订下午两点半的四人桌,请你编辑邮件。	You are the CEO's secretary and need to send an email in Spanish to the hotel to reserve a table for four at 2:30 pm. Please edit the email.
E13 (P4)	Escribir una carta a la redacción de un periódico para el examen de DELE C1, por lo menos 230 palabras. Usted es un habitante local y no está conforme con los ruidos de los bares del centro. Los vecinos han denunciado esta situación al gobierno, pero aún no hay la mejora. Lea la siguiente noticia y escriba una carta dirigida a la redacción del periódico Mundo Ñ en la que exponga: los motivos de su inconformidad con la decisión, qué otros problemas pueden generarse por los ruidos; cuáles son las alternativas de solución al problema existente; la respuesta que espera de las autoridades locales.	Write a letter to the editorial staff of a newspaper for the DELE C1 exam, at least 230 words. You are a local resident and you are not happy with the noise from the bars in the city center. The neighbors have reported this situation to the government, but there has still been no improvement. Read the following news item and write a letter addressed to the editorial staff of the Mundo Ñ newspaper in which you explain the reasons for your disagreement with the decision; what other problems may be generated by the noise; what are the alternative solutions to the existing problem; the response you expect from the local authorities.

specific needs. This task-oriented approach may lead to insufficient reflection and knowledge consolidation once participants obtain satisfactory answers. This aspect warrants further exploration in future research to better understand its implications for learning outcomes.

5.2.4 Learning grammar and discourse

As illustrated by Table 6, participants frequently asked ChatGPT to explain specific grammar rules (E14, E16) or to provide feedback or evaluations (E15). However, they

Table 6: Examples of prompts for learning grammar and discourse features through ChatGPT.

Example	Original prompt	Translation
E14 (P1)	Prompt 1: translate ***I feel like doing something new*** in Spanish ChatGPT: "I feel like doing something new" in Spanish is "Tengo ganas de hacer algo nuevo". Prompt 2: Why there is a ***de*** ChatGPT: [explanation]	
E15 (P9)	请你检查并纠正以下句子的语法错误: ***Las margaritas es unas flores blanca.***	Please check and correct the grammatical errors in the following sentences: ***Daisies are white flowers.***
E16 (P8)	Prompt 1: traduce ***I need to pick up my cousin from the train station*** en español ChatGPT: [translation] Prompt 2: porque usa ***a mi primo*** ChatGPT: [explain why use ***a mi primo***] Prompt 3: No, quiero decir porque hay una ***a*** ChatGPT: [explain why use ***a***]	Prompt 1: translate ***I need to pick up my cousin from the train station*** in Spanish ChatGPT: [translation] Prompt 2: why use ***a mi primo*** ChatGPT: [explain why use ***a mi primo***] Prompt 3: No, I want to say why is there a ***a*** ChatGPT: [explain why use ***a***]

did not inquire about general or abstract grammar concepts, which is understandable given their limited language proficiency. This focus also reflects their interest in applying grammar to real-life contexts. It is interesting to note that in E16, due to unclear phrasing by the participant, ChatGPT initially misunderstood the request. The participant then clarified the question and thus obtained the desired information.

5.2.5 Mastering oral expression

In Table 7, P1 and P4 used ChatGPT to request Spanish expressions for everyday situations and conversations. The prompts they used were generally simple and expressed in the languages they were more comfortable with: Chinese and English. Presumably this was because they had a communicative need that they felt unable to articulate in Spanish.

Noteworthy is P4's use of role-playing in E19, where ChatGPT is asked to act as her "Spanish teacher." By positioning the AI as a teacher, the student is able to create a more interactive and instructional experience that leads to specific, tailored responses. This indicates a desire for personalized oral instruction, simulating the experience of working with a language tutor.

Table 7: Examples of prompts for learning oral expression through ChatGPT.

Example	Original prompt	Translation
E17 (P1)	How to say ***It's time to do something*** in Spanish?	
E18 (P4)	Prompt 1: 怎样描述马拉加这个城市? ChatGPT: [Answer in Chinese] Prompt 2: 怎样用西班牙语描述马拉加这个城市? ChatGPT: [Answer in Spanish]	Prompt 1: How can the city of Malaga be described? ChatGPT: [Answer in Chinese] Prompt 2: How can the city of Malaga be described in Spanish? ChatGPT: [Answer in Spanish]
E19 (P4)	Prompt 1: 你现在是我的西班牙语口语老师,请教给我一些地道的西班牙语表达。 Prompt 2: 如果我在餐厅吃完饭,我应该怎么跟服务员说付钱。 Prompt 3: 我点了一份牛排,但是牛排不太熟,应该怎么跟服务员说做熟一点?	Prompt 1: You are now my Spanish speaking teacher, please teach me some authentic Spanish expressions. Prompt 2: If I have finished my meal at a restaurant, how should I ask the waiter to bring me the bill? Prompt 3: I ordered a steak, but it's not cooked enough. How should I ask the waiter to cook it a bit more?

E19 also illustrates the use of scenario-based prompts. For example, participants occasionally asked for practical phrases in spoken Spanish that were appropriate to specific contexts such as a restaurant. This highlights the participants' need for functional language learning, suggesting that they were not merely focusing on isolated vocabulary or grammar, but were seeking expressions applicable to real-life social situations.

5.2.6 Making study plans and getting suggestions

In addition to obtaining specific language knowledge, one participant (P9) also used ChatGPT to create study plans and seek advice.

In Table 8, P9 utilized ChatGPT not only to create study plans (E20) but also sought academic guidance (E21, E22). These prompts highlight key behaviors in the student's learning process:

(1) Proactivity in self-directed learning: The participant actively defined their learning needs and objectives, leveraging ChatGPT as a tool to bridge gaps in traditional learning resources.

Table 8: Examples of prompts for making study plans and getting suggestions through ChatGPT.

Example	Original prompt	Translation
E20 (P9)	请给我一个七天的关于提高西班牙语学术写作的学习方案,我的西语基础是DELE B2水平,我希望这个学习方案能够包含西语语法、西语词汇、西语学术思维、外国投资相关专业术语,以上的学习都是为了完成西语硕士论文。	Please provide me with a seven-day study plan to improve my Spanish academic writing skills. My current level is DELE B2, and I hope this plan can include Spanish grammar, Spanish vocabulary, Spanish academic thinking, and professional terminology related to foreign investment. All of this learning is aimed at helping me complete my master's thesis in Spanish.
E21 (P9)	如何撰写一篇优秀的西语硕士毕业论文?	How can I write an excellent master's thesis in Spanish?
E22 (P9)	能否推荐关于西班牙语学术写作规范和技巧的书籍或在线文章?	Could you recommend books or online articles on Spanish academic writing standards and techniques?

(2) Metacognitive awareness: These prompts demonstrate a high level of self-awareness regarding the student's learning deficiencies and a strategic effort to address them using AI solutions.

This type of interaction reflects a shift from task-based queries to more goal-oriented, metacognitive engagement, yet P9 mentioned in her learning diary that ChatGPT's suggestions were not very helpful to her. This can be attributed partly to the limitations of the GPT-3.5 model (i.e., its inability to perform search tasks effectively), but may also reflect student awareness of the need to be critical with AI results.

5.3 How participants interact with ChatGPT

This section analyzes students' language preferences and interaction patterns with ChatGPT. While most participants favored Chinese for clarity in complex prompts, Spanish for simpler queries, only one participant used English for accuracy. Regarding interaction patterns, simple interactions dominated, with interaction cycles being less frequent but reflecting metacognitive engagement and critical thinking. Overall, the prevalence of single interaction highlights a task-oriented approach, prioritizing immediate problem-solving over reflective learning.

Table 9: Examples of the classification of prompt languages.

	Spanish	Chinese	English
Monolingual prompts	Qué significa: ***cada granito de arena cuenta*** (What does ***cada granito de arena cuenta*** mean?)	西班牙语中表示方位的有哪些词汇? (What are the vocabulary words in Spanish used to indicate direction or position?)	How to say ***It's time to do something*** in Spanish.
Bilingual prompts (in some cases, the specific content of the query might be in Spanish, resulting in bilingual prompts)		***Hacer la vista gorda*** 中文什么意思? (What does *Hacer la vista gorda* mean in Chinese?)	What does ***indexable*** mean?

5.3.1 Language preference

Given that the participants are multilingual speakers, they used their preferred languages to interact with ChatGPT based on comfort, proficiency, or specific linguistic needs. The prompts were categorized into three languages: Spanish, Chinese, English, or a combination thereof. As shown in Table 9, when bilingual prompts appeared, our classification of prompt languages was based on the language used to pose the question, regardless of the specific content of the query.

Figure 3 shows that most participants primarily used Chinese in their prompts, especially P7, P6, P9, and P3. This preference likely reflects the cognitive ease and accuracy they experience when expressing complex or specific queries in their

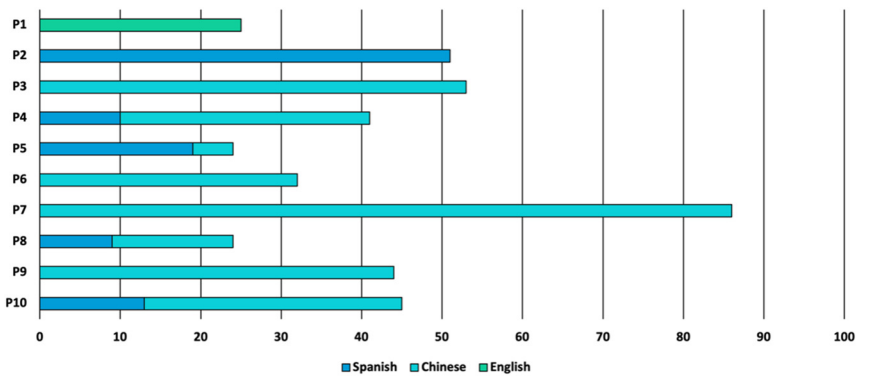

Figure 3: Prompt languages, broken down by participant.

native language. Some participants (P10, P8, P5, P4) used not only Chinese but also Spanish, albeit at a noticeably lower frequency. Their prompts in Spanish were typically simple queries, such as vocabulary lookups or text translation requests. P2, however, used Spanish exclusively for her prompts. This reflects both her confidence in using the target language directly and her effort to engage with ChatGPT in Spanish, demonstrating a commitment to practicing and improving their language skills.

Only P1 made significant use of English in her prompts. This choice can be attributed to her lower proficiency in Spanish. In her diary, she explained that she believed that using English prompts would yield more precise and clearer responses.

5.3.2 Student-AI interaction patterns

This section identifies two patterns of student-AI interaction during the learning process: simple interactions and interaction cycles. Simple interactions typically consisted of a single prompt followed by ChatGPT's response. Interaction cycles, on the other hand, refer to multiple sequential prompts from the learner related to a single question or task, accompanied by multiple responses from ChatGPT. According to our statistics, the ten participants engaged in a total of 303 simple interactions and 31 interaction cycles, the number of simple interactions thus being nearly ten times that of interaction cycles.

Table 10 highlights the difference between simple interactions and interaction cycles. Simple interactions focus on a direct, specific query, like asking "What does indexable mean?", and receiving an immediate answer. In contrast, interaction cycles shows that students seek further clarification or additional information. For example, after asking "What does Colchoneta mean?" the student asked, "For example" and "What are the words related to it?" This reveals a more reflective and iterative learning process. While simple interactions focus on quick answers, interaction cycles show deeper engagement and critical thinking, as students

Table 10: Examples of a simple interaction and an interaction cycle.

Simple interaction	Interaction cycles
Prompt: What does ***indexable*** mean ChatGPT: [explanation]	Prompt 1: What does ***Colchoneta*** mean ChatGPT: [explanation] Prompt 2: For example ChatGPT: [explanation] Prompt 3: What are the words related to it? ChatGPT: [explanation]

compare ChatGPT' answers with their previous knowledge and actively seek more detailed explanations.

Table 11 focuses on analyzing the reasons behind the occurrence of interaction cycles. The first two types of interaction cycles – errors in responses or searching other strategies – reveal dissatisfaction with the answers and reflect students' careful examination of the AI's output and their proactive effort to look for more useful answers. This demonstrates students' critical thinking and their demand for adequate answers to their needs during AI interactions.

The third type of interaction cycle, which occurred 17 times and is the most common, indicates that students not only accepted the initial response from ChatGPT but also sought more detailed explanations. This suggests a metacognitive awareness, where students recognize that their understanding may be improved with more data and are willing to ask further questions.

The last and least common type of interaction involves students proactively requesting expanded learning. They aim to delve deeper into the subject matter after

Table 11: Analysis of the interaction cycle.

Reasons for cycle	Example	Numbers
1. Correcting ChatGPT errors or misinterpretations	Prompt 1: translate ***I need to pick up my cousin from the train station*** in Spanish ChatGPT: [translation] Prompt 2: why use ***a mi primo*** ChatGPT: [explain why use ***a mi primo***] Prompt 3: No, I want to say why is there a ***a*** ChatGPT: [explain why use ***a***]	5
2. Searching another strategy	Prompt 1: What does ***indexable*** mean ChatGPT: [explanation] Prompt 2: and in Chinese? How do you say it? ChatGPT: [explanation]	6
3. Seeking more specific explanations	Prompt 1: translate ***I feel like doing something new*** in Spanish ChatGPT: [translation] Prompt 2: Why there is a ***de*** ChatGPT: [explanation]	17
4. Requesting expanded information	Prompt 1: What does ***colchoneta*** mean ChatGPT: [explanation] Prompt 2: For example ChatGPT: [examples] Prompt 3: What are the words related to it? ChatGPT: [examples]	3

receiving an initial response. This interaction suggests that students have a stronger self-directed learning (SDL) ability, which may help them achieve a more comprehensive mastery and understanding of language learning content.

These interaction cycles embody the concept of "scaffolding" from Vygotsky's theory, where students receive incremental feedback and support through their interactions with ChatGPT. Furthermore, these findings also confirm that, in language education in the AI era, it is not only important to cultivate students' digital literacy, but more importantly, to foster their critical thinking and self-directed learning abilities (Kohnke et al. 2023; Muñoz-Basols and Fuertes Gutiérrez 2023).

Figure 4 shows a clear preference for single prompts across almost all participants. P3, P4, P7, P9, and P10 exhibit especially high frequencies of single prompts, with participant 7 being the most noteworthy, with almost 70 single prompts. In other words, most participants use ChatGPT for quick, one-time queries, likely aiming for straightforward answers without the need for extended dialogue. In contrast, interaction cycles – where participants engage in multiple, sequential queries to refine or expand upon a single topic – are much less common.

There is substantial individual variation in the ratio of single prompts to interaction cycles. P1 and P8 show a somewhat balanced use of single prompts and interaction cycles compared to the other participants, though single prompts still predominate. The variation suggests differing levels of metacognitive awareness among participants, with some demonstrating a more exploratory approach that leverages interaction cycles to scaffold understanding. By contrast, the predominance of single prompts suggests a task-oriented and efficiency-driven approach to

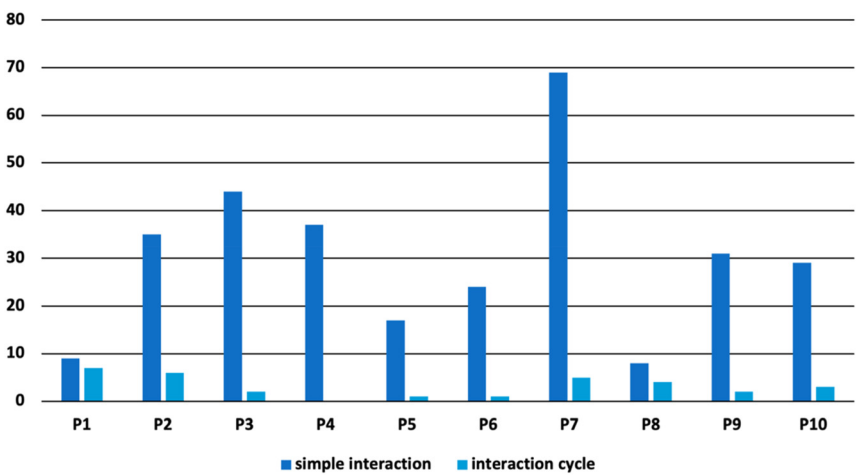

Figure 4: Numbers of interactions, broken down by participant and interaction type.

using ChatGPT. Most participants are likely seeking quick solutions without fully utilizing the potential of interaction cycles to explore more deeply, which would imply more reflective learning.

6 Discussion

Our results reveal both the benefits and challenges of using ChatGPT in students' Spanish language learning process, drawing on Vygotsky's (1978) social constructivism theory.

First and foremost, ChatGPT serves in many contexts as a scaffold in both L2 input and output processes, providing real-time support that helps students improve their skills. ChatGPT effectively supports diverse language learning needs, aligning with the affordances noted by Kohnke et al. (2023). Unlike traditional tools limited to specific tasks like lexical consultation or grammar explanation, ChatGPT functions as an "all-in-one" language learning platform, meeting multiple needs in a cohesive way. Students use it not only for vocabulary learning, comprehension, and text generation but also for grammar explanations and speaking practice.

Based on the results, the frequency of queries related to vocabulary, text comprehension, and writing significantly exceeded that of queries concerning grammar and oral communication. This trend can be attributed to two factors. On the one hand, the Chinese Spanish education system places greater emphasis on grammar and literature rather than communication (Méndez Marassa 2009). From a learning perspective, Chinese L2 learners also lack motivation for speaking practice. They focus more on the grammatical approach of language learning rather than its practical application (Amoah and Yeboah 2021). On the other hand, this pattern is also related to the capabilities of the generative AI, which excels in text generation and interpretation, making it particularly well-suited for explaining vocabulary, grammar, and writing. However, the GPT-3.5 model lacked speech interaction functionality. With the introduction of the GPT- 4 model, which incorporates this feature, oral communication with AI has become feasible. Future research could continue to focus on the role of AI in facilitating oral communication interactions between students and AI.

Drawing on Vygotsky's (2012) theory, the immediate feedback offered by ChatGPT aids in knowledge internalization. For example, ChatGPT can deliver vocabulary definitions, example sentences, and cultural context within the learner's zone of proximal development. Similarly to Muñoz-Basols and Gutiérrez (2023), this study found that, unlike static tools, ChatGPT dynamically adapts to individual needs, offering more personalized and tailored support. However, effective use of the tool requires users to have strong metacognitive skills. Students must be able to identify

their needs, formulate effective prompts, critically evaluate responses, and adjust queries as needed. This approach encourages active engagement and autonomy, often more so than in human-to-human interactions.

In written expression activities, students can use ChatGPT to generate templates for imitation, benefiting from personalized assistance like editing and feedback, as also highlighted by Fathi and Rahimi (2024). ChatGPT's contextual memory allows it to track conversations, making follow-up responses more relevant and helping students progress at their own pace.

Nonetheless, while ChatGPT offers significant benefits as a scaffolding tool in language learning, several challenges remain that require further attention and intervention, particularly in the context of learning Spanish. One of the primary challenges is the fragmented nature of language acquisition through ChatGPT. The significantly higher number of simple interactions compared to interaction cycles seen in the present study indicates that students tend to focus on specific knowledge points rather than integrating these points into a coherent understanding of the language. Unlike a human teacher, who can guide learners through a structured curriculum, ChatGPT lacks the ability to provide holistic and sequential language learning content. This limitation suggests a need for educators to step in and help students organize and synthesize the discrete pieces of information they acquire through AI interactions.

While ChatGPT facilitates a wide range of interactions, these are often limited by the prompts provided by students. Among the 1,611 Japanese university students surveyed in a recent study, 522 mentioned that they had not received guidance on using AI for learning (Aroz et al. 2025). Thus, teachers can play a crucial role in enhancing these interactions by guiding students in constructing more effective prompts and encouraging a more interactive dialogue with the AI. For example, educators could introduce students to methods which will allow them to ask more complex and open-ended questions, thereby enriching the learning experience and making better use of ChatGPT's capabilities.

Another significant challenge is the task-oriented approach that many students adopt when using ChatGPT. While this approach can be effective for completing specific tasks, it often leads to a lack of reflection on the learning process itself. Li et al. (2024a) suggest that the interaction between learners' individual characteristics and ChatGPT's dynamic functionalities creates an AI-enhanced personalized learning experience. Building on this insight, teachers can address this gap by teaching students' self-regulation techniques and encouraging them to reflect on the content of their learning in order to develop a more metacognitive approach to language learning.

While ChatGPT can assist students in completing various language tasks, students often need guidance on how to critically evaluate the tool's output. ChatGPT is

known to occasionally produce “hallucinations”, and it is essential that students should be able to identify such faulty responses. Teachers could provide students with training in this regard.

7 Conclusions

Guided by Vygotsky’s (1978) social constructivism theory, this study has explored how students use ChatGPT to meet their learning needs in the course of informal Spanish language learning. In relation to our RQ1, students primarily used ChatGPT for vocabulary acquisition, text comprehension, and written expression, while showing less interest in grammar points and oral communication. Additionally, one participant creatively utilized AI to develop study plans and seek academic advice. Significant differences were also observed in the learning needs that each participant endeavored to meet using AI. While some participants used ChatGPT to meet three or four areas, others focused solely on vocabulary or writing through AI.

In relation to RQ2, the specific features of student-IA interactions were analyzed. First, it was observed that beyond the diverse categories of learning content that students used ChatGPT to explore, the specific prompts within each category were also highly varied. For example, in the writing category, prompts ranged from queries about basic expressions to requests for samples of emails or exam writings. Second, students employed different strategies to formulate their prompts. For instance, when learning vocabulary, they asked the program to compare the differences between two words to better understand their meanings; when focusing on writing, they copied and pasted exam writing requirements, asking ChatGPT to provide writing templates; and when practicing oral expression, they assigned ChatGPT the role of a teacher or set up specific conversational scenarios.

Regarding students’ language preferences for prompts, eight participants used Chinese, five used Spanish, with four of them switching between Chinese and Spanish, and one participant used English exclusively. For complex queries, participants tended to use Chinese (their native language) to ensure clarity and precision. Simpler questions, however, were often asked in Spanish or English, aiming for more accurate responses.

Regarding their specific interaction patterns, two types were identified: simple interactions (a single prompt followed by ChatGPT’s response) and more complex interactions involving multiple prompts and responses, labeled as interaction cycles. Among the 31 interaction cycles observed, common needs included addressing errors, refining responses, seeking further explanation, and expanding queries for deeper learning. While interaction cycles demonstrate students’ critical thinking and

metacognitive skills, simple interactions (303 times) overwhelmingly dominated, reflecting a task-oriented learning approach with limited reflection.

The findings of this study hold significant implications for understanding the three-way relationship between teachers, AI, and learners as a new dimension of interaction. The challenges students face when using AI for language learning highlight the need for teacher intervention in this process. Rather than focusing solely on teaching specific knowledge, the role of teachers in the AI era should perhaps shift towards fostering students' critical thinking and self-directed learning skills.

8 Limitations and implications for future research

Several limitations should be acknowledged when interpreting the findings of this study. The study was conducted with a relatively small group of ten participants, all of whom were Chinese students currently studying in Spain. While the qualitative data provided rich insights, the limited sample size and specific demographic may restrict the generalizability of the findings to a broader population of Spanish learners. Additionally, the study took place over a short period of one week, which, although sufficient for collecting initial interaction data, may not have allowed for the observation of long-term learning outcomes or the sustained use of ChatGPT in language learning. These factors could influence how students interact with ChatGPT and perceive its usefulness, making the findings less applicable to learners from different cultural and linguistic backgrounds or in different learning contexts.

Finally, the findings of this study suggest three possible directions for future research. First, it would be useful to delve deeper into how teachers can address the challenges students face when using AI for learning, and whether teacher intervention and guidance can enhance students' learning efficiency. Secondly, while this study analyzed students' learning needs across six different categories, future research could focus on one of these categories in particular to conduct a more in-depth investigation. Thirdly and lastly, given the limited number of participants and the short duration of this study, future studies could expand the sample size to validate these findings. Longitudinal research could also be conducted to examine the long-term effects of AI use on learners' learning efficiency and outcomes, offering a more comprehensive understanding of its impact.

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