"I Can Talk to Spanish Speakers in Illinois!":
Student Perspectives on AI-Avatar Role Plays in Virtual Reality

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Abstract

This paper reports on a study exploring students' perceptions of AI-avatar interactions within a virtual reality (VR) language learning environment, *Immerse*. As part of a large-scale project, this research explores the impact of Immerse's AI-powered avatars on the educational experience of 54 high school participants. Based on students' attitudes and opinions expressed in post-use surveys, findings reveal a positive experience. The majority of students expressed enjoyment, being able to understand the AI chatbots, and being focused on the VR activities. Challenges, such as technical and acoustic difficulties, underscore the need for refinement in VR technology. This study contributes insights into the ongoing integration of AI-avatar role plays in VR-assisted language education.

Keywords: Virtual Reality-Assisted Language Learning, Artificial Intelligence, AI-Powered Avatars, Student Perspectives

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Introduction

This paper reports on the early stages of a large-scale project examining student attitudes and perceptions of learning with AI-avatars in the VR language learning platform, *Immerse* (Thrasher et al., 2023). With grant-funding received in collaboration with Immerse, Inc. from Facebook/Meta, we are conducting a large-scale project that involves distributing 500 VR headsets across 10 high schools located throughout Illinois, California, and Texas, and evaluating their impact on language education. As of December 2023, approximately 487 students are actively involved in the project.

This paper will focus on a subset of 54 participants ($n_1 = 54$) who have been using Immerse's AI-powered avatars for L2 speaking practice in Spanish or French. After an overview of the project and language learning platform, students' attitudes regarding the impact of conversing with AI-powered avatars on their language learning will be presented. Understanding students' opinions towards interacting with AI-powered avatars in VR is critical, as AI and VR technologies are continually being refined and becoming readily available to educators.

Conversational AI in Second Language Acquisition

Conversational AI is designed to simulate real-life conversation thanks to natural language processing (NLP) and natural language generation (NLG). With its recent surge in development, many CALL researchers have focused on using conversational AI in second language education. While several studies have explored the potential of this technology to improve students' willingness to communicate (WTC) and foreign language anxiety (FLA; Ayedoun et al., 2019; Lee & Lee, 2020; Tai & Chen, 2020), most studies have focused on students' perceptions of conversational AI due to the relative novelty of the technology in SLA (Fryer et al., 2019). The connection between students' positive perceptions of conversational AI and students' engagement in foreign language classes has been documented (Dizon & Tang, 2020; Yang et al., 2022). As positive perceptions of the technology are closely tied to the human-likeness of conversational AI partners (Ebadi & Amini, 2022; Fryer et al., 2019, Wang et al., 2022), immersive conversational AI, which combines personalization of AI-powered bots with immersive experience in VR, warrants further exploration in foreign language classrooms.

Several short-term studies on immersive conversational AI in SLA have been conducted in non-naturalistic settings. For example, Hassani et al. (2016) reported significant learning gains in the speaking skills of 10 university-level English as a Second Language (ESL) students. Divekar et al. (2021) reported gains in vocabulary acquisition, increased WTC, and positive perceptions of the technology among Chinese as a Foreign Language learners. Nevertheless, more research needs to be conducted in a naturalistic setting with high-school students focusing on other languages to contribute to the ecological validity of studies on immersive conversational AI for SLA.

Methods

Participants in the study were 54 high school students enrolled in either French or Spanish language classes. Their ages ranged from 13-19 years old ($M = 15.46$, $SD = 1.11$). All students came from central Illinois, USA.

Students completed all VR activities in Immerse (www.immerse.com) using a Meta Quest 2 VR headset. In Immerse, students engaged in AI-powered avatar role plays which allowed them to practice different communicative tasks one-on-one with an avatar in the target language. Immerse has dozens of AI-role plays for pre-A1 – B2 (i.e., beginner-intermediate) level learners, based on the Common European Framework of Reference for Languages (CEFR). Scenarios ranged from ordering at a restaurant to talking about ailments at the doctor's office (Figure 1). Students were guided through each role play by a checklist that told them what they needed to accomplish (Figure 2). Immerse offers built-in features that allow students to ask for hints and translate words into English or their L2 when at a loss for words. The AI avatars, powered by ChatGPT 4.0, can "understand" input that is not entirely correct grammatically and can also reply to requests from the learners, for example, to speak more slowly (see Figure 2).
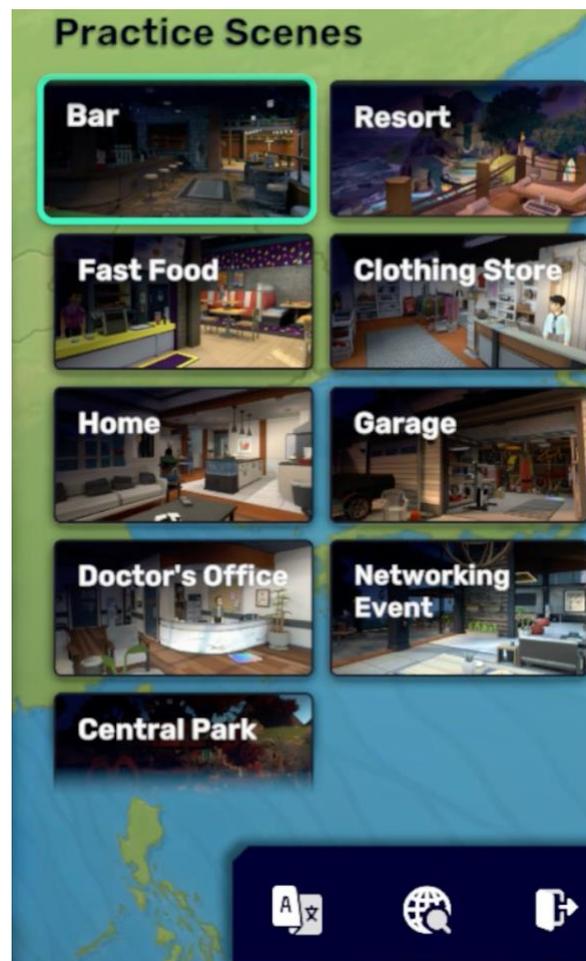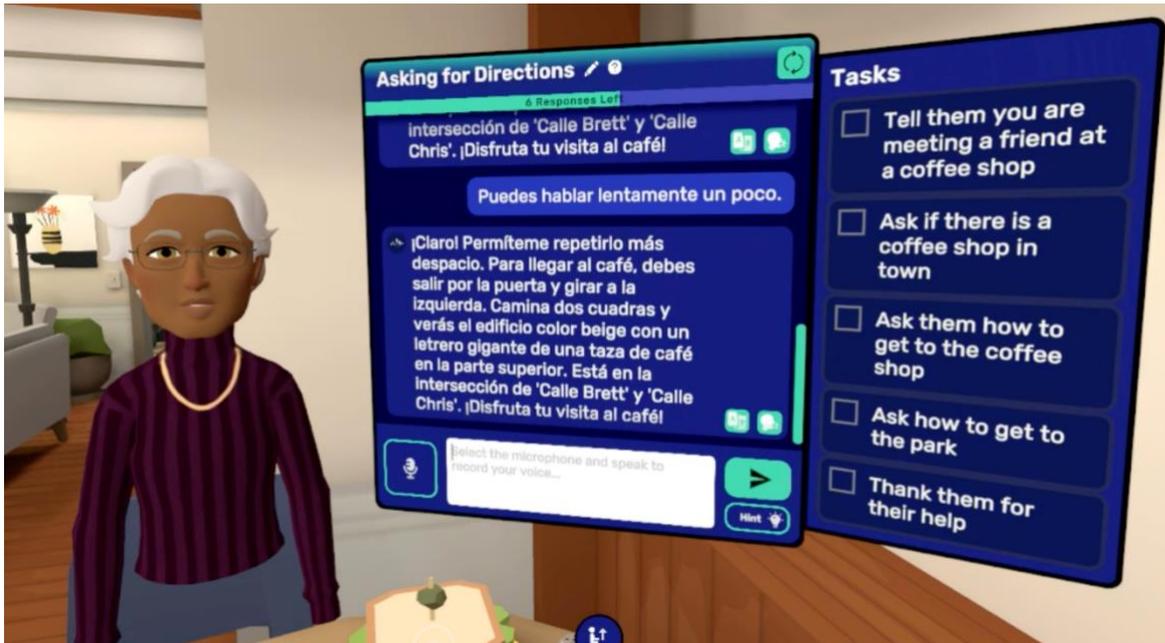

Figure 1: AI practice scenes in Immerse

Figure 2: Screenshot of AI-powered role play asking about directions

For this study, students completed role plays in Immerse's shopping center, fast-food restaurant, and home scene. All role plays were selected by teachers to ensure that the task aligned with what students were learning in their language classes.

Following each VR activity, participants completed a 5-point Likert-scale post-activity questionnaire where they gave feedback on their experience. In this survey, participants rated 21 statements that targeted constructs such as enjoyment, FLA, and cognitive load. This survey was kept brief to allow students to quickly respond and not detract from class time. Students were also asked to provide qualitative feedback about what they liked and disliked (if anything) about the AI-powered role-play scenarios.

Findings and Discussion

Table 1 presents participants' ratings to a subset of 10 questionnaire statements, particularly those pertinent to students' interaction with the AI avatars.

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I enjoyed using VR today.	7.69%	15.28%	12.82%	33.33%	30.77%
VR helped me communicate easily in the foreign language.	8.11%	21.62%	21.62%	37.84%	10.81%
I understood most of what the AI bot said.	5.56%	8.33%	8.33%	44.44%	33.33%
Chatting with the AI bot helped me learn phrases and sentences.	5.56%	19.44%	13.89%	41.46%	19.44%
Chatting with the AI bot felt like a real conversation.	9.09%	15.15%	33.33%	33.33%	9.09%
I felt relaxed when completing the activity today.	5.56%	16.67%	30.56%	33.33%	13.89%
I felt confident during this activity.	2.86%	17.14%	25.71%	40.00%	14.29%
I was more nervous during this activity than during normal class time.	25.71%	45.71%	20.00%	8.57%	0%
I was fully focused on the activities in VR today.	3.03%	6.06%	21.21%	57.58%	12.12%
I was distracted by too many things in VR today.	15.15%	48.48%	18.18%	15.15%	3.03%

Table 1: Students' post-activity survey responses

Students' responses indicate that they had a positive experience using VR. Most students (64.1%) reported enjoying using VR. Moreover, about half (48.65%) of participants said that it helped them communicate easily in a foreign language. Regarding interacting with AI-bots, the majority (77.8%) expressed being able to understand most of what the AI-bot said, and 60.9% of the students said that chatting with AI helped them learn new phrases and sentences. Claiming that chatting with AI felt like a real conversation was expressed by 42.4% of the participants.

Regarding students' confidence and focus in VR, almost half (47.22%) of the students reported being relaxed, with a little over half (54.29%) being confident during VR activities. Only 8.57% of students said that they were more nervous during VR activities than during normal class time. The majority of participants (69.7%) said that they were able to be fully focused on the VR activities and only 18.18% reported being distracted by things in the VR environment.

Lastly, students provided both positive and negative comments about their AI-VR experiences (Table 2).

What students liked:	What students disliked:
Exploration • "Exploring new locations." • "It was fun to take a break from a normal class setting." *Interaction* • "Talking to others." • "Got to have an advanced conversation." • "The natural conversation with the task list is nice." • "That I can talk to Spanish speakers in Illinois." *Learner Autonomy* • "I like just being on my own and being able to learn the meaning of words I didn't know easily." • "Everyone was able to work on their own activity and could choose the difficulty at which best fit their skill level."	*Technical Issues* • "The AI didn't often work." • "Microphone didn't pick up my speech even when it was loud." *Communication Issues* • "I was unable to communicate with the AI bot in any capacity." *Classroom Issues* • "Talking with everyone in the room is challenging." *Lack of Student Training* • "I felt like I didn't know enough about the headset in order to fix problems myself."

Table 2: Students' qualitative feedback

Although students were provided with headphones that could be used with the headsets, they still struggled at times to communicate effectively with the AI-bots due to background noise from their classmates who were located in the same physical space. This is a limitation of using VR in a classroom setting, as most VR experiences have been designed for users to connect while being physically located in different locations.

Conclusion

This study examined students' perceptions regarding interaction with AI chatbots in *Immerse* within the context of foreign language education. The findings reveal a generally positive reception to VR as a language learning tool. Most students enjoyed the VR experience, feeling capable of understanding the AI bot's speech, and learning new phrases and sentences. These findings are aligned with previous studies reporting positive perceptions towards conversational AI (Dizon & Tang, 2020; Yang et al., 2022) and new vocabulary acquisition facilitation (Divekar et al. 2021). Interestingly, the minority of participants felt that chatting with the AI bot was like a real conversation. This finding warrants further investigation. Perhaps integrating more VR actions or interactions with the AI conversations could be considered. Nonetheless, in the open-ended comments, students appreciated being able to talk to others (e.g., Spanish speakers in Illinois) and having "advanced" and "natural" conversations with the AI chatbots.

Most participants expressed high confidence. Importantly, they believed they were able to fully focus on activities in VR which highlights VR's ability to immerse learners in the virtual environment. However, challenges, such as communication difficulties with AI-powered avatars and technical issues, underline the need for further refinement. To address these challenges, we suggest the manufacturers enhance microphones to eliminate background noise while recording. In addition, we suggest that students receive sufficient training on how to better navigate hand controllers in VR. Pedagogically, we suggest that AI interactions with chatbots are better suited as individual assignments or small-group activities, but not as whole-class activities. As VR technology advances, addressing these challenges will be crucial to maximizing the benefits of AI-avatar role plays in language education.

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