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Exploring the Synergistic Effects of LLM-Based Conversational AI and Teacher Intervention on L2 Learners' Interactional Competence

Jia Xing

School of Education, Shanghai International Studies University, Shanghai, China
0231113042@shisu.edu.cn

Abstract. This study investigates how Large Language Model (LLM)-based conversational AI and human teacher intervention affect the development of Second Language (L2) Interactional Competence (IC). Employing a two-phase qualitative research design, the study first analyzes interaction texts and reflective journals from five college volunteers. This initial phase isolates the AI's effect on verbal IC dimensions, specifically topic management, turn management, interactive listening, and breakdown repair, until theoretical saturation is reached. Building on this established baseline, the investigation proceeds to a high school oral workshop setting, where classroom observations and an in-depth teacher interview evaluate a human-AI collaborative teaching model. The data shows that AI provides a low-pressure practice environment that effectively improves basic turn-taking and topic initiation. However, AI fundamentally lacks the emotional resonance and non-verbal behavior guidance required for authentic human communication. Teacher intervention is absolutely necessary to scaffold non-verbal behaviors like eye contact and physical gestures. Teachers also play a vital role in adjusting conversational prompts when the AI misunderstands the student. The study concludes that combining AI's capacity for high-frequency linguistic practice with a human teacher's pragmatic and emotional guidance offers a highly useful approach to cultivating L2 learners' interactional competence.

Keywords: interactional competence, second language acquisition, artificial intelligence, English speaking, human-machine collaboration

1. Introduction

Achieving successful communication in a second language relies heavily on mastering Interactional Competence (IC). When learners talk to each other in real life, they have to manage topics, take turns smoothly, and use body language to show they are actively listening. Many English as a Foreign Language (EFL) learners in China face difficulties in these spontaneous social interactions. Despite years of formal education and high scores on written exams, students often freeze up during speaking activities. They show strong reticence and prefer to stay entirely passive [1]. Insufficient opportunities for interactive practice deny learners the immersive context essential for navigating authentic English-language conversations.

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AI conversational bots have recently become popular tools to solve this problem. Generative AI tools function as tireless practice partners that do not judge or grade the user. According to Huang et al., chatbots are highly useful in supporting language learning because they provide a comfortable and approachable practice space [2]. Building on this idea, Wang et al. found that generative AI chatbots can significantly reduce learners' foreign language speaking anxiety and encourage them to communicate more openly [3].

A major research gap remains regarding the micro-level skills needed for real human interaction. Galaczi and Taylor proposed that true Interactional Competence must include non-verbal behaviors and deep interactive listening [4]. Current AI systems do not have physical bodies, and they do not feel genuine emotion. A chatbot might generate a text response that looks empathetic, but it operates entirely on statistical word prediction. This means that relying exclusively on AI training leaves an incomplete learning path.

To bridge this theoretical gap, this study explores how AI and human teacher intervention can work together. Through a two-phase qualitative design, the research analyzes college volunteers' AI interaction texts and observes a high school oral workshop. The goal is to investigate exactly how human teachers can make up for the machine's empathy and non-verbal deficits. This research offers suggestions for frontline educators on how to integrate technology properly into their daily instruction. The interactional architecture of the classroom relies heavily on the teacher's active guidance [5]. This collaborative model ensures that students acquire the high-frequency linguistic input from machines while learning authentic social interaction skills from human teachers.

2. Methodology

2.1. Research design

This study adopted a two-phase qualitative research design to explore the synergistic effects of LLM-based conversational AI and teacher intervention on L2 Interactional Competence. Qualitative inquiry was chosen because it allows for a sequential analysis of how interactional micro-skills and pedagogical strategies are co-constructed in real-time. Of particular analytical interest were learners' utterance formulation, pause duration and frequency, and their affective responses to AI-generated feedback.

Phase One was an exploratory pilot study with university volunteers designed to identify the AI's effects on verbal IC dimensions and seek its sociopragmatic limitations. Phase Two implemented an oral workshop in a secondary school setting. This phase evaluated how targeted human teacher intervention compensates for the exact deficits sought in Phase One.

2.2. Participants and context

The study engaged two purposeful participant samples across different educational stages to capture a broad view of the EFL learning experience.

For Phase One, five Chinese undergraduate EFL learners were recruited through voluntary sampling. They majored in completely different disciplines, including biology, metallurgy, and finance. They represented intermediate-level learners who had solid grammatical knowledge but frequently experienced speaking anxiety during spontaneous conversations.

For Phase Two, the participants pool comprised twelve senior high school students and one experienced EFL teacher in the workshop. The students were divided into small groups of three to four, which could ensure high visibility for observation and allowed for close interactive feedback.

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The participating teacher brought extensive frontline experience in managing large classes of over fifty students. Her background provided a highly reliable comparative baseline for evaluating the new collaborative model against traditional, large-scale teaching methods.

2.3. Data collection procedures

Data collection was systematically structured across the two phases to capture both linguistic output and pedagogical dynamics.

In Phase One, the five university volunteers conducted autonomous conversational sessions with LLM chatbots like Doubao and ChatGPT. They discussed personalized topics such as their academic stress, career choices, and daily routines. Both audio and textual interaction transcripts were gathered to maintain a precise record. Following each session, the learners completed qualitative reflective journals structured around the four verbal IC dimensions. They recorded their affective responses during the chat, the specific points of frustration they encountered, and the areas in which they perceived measurable improvement. Data collection in this phase continued until theoretical saturation was reached.

In Phase Two, a 90-minute collaborative oral workshop was observed in the high school setting. The pedagogical sequence followed five specific stages. First, the teacher introduced the topic and helped students set up a standardized prompt on their devices (10–12 minutes). Second, the students practiced autonomously with the AI (15 minutes). Third, the teacher intervened to focus heavily on non-verbal and pragmatic cues (20–25 minutes). Fourth, the students engaged in human-AI collaborative re-practice and face-to-face roleplay within their small groups (18–20 minutes). Finally, the students spent 10 minutes reflecting on the activity. Upon completion of the workshop, a semi-structured interview was conducted with the teacher to capture her pedagogical reasoning, her observations of student engagement, and her reflections on the non-verbal scaffolding process.

2.4. Data analysis and trustworthiness

Data were analyzed using two established qualitative approaches to ensure depth and accuracy.

Conversation Analysis (CA) was applied to the transcribed AI interaction logs. CA allowed the researcher to examine the sequential organization of the dialogues and track specific verbal IC behaviors. We looked at how often a student initiated a topic, how they used backchannels for turn transitions, and how they handled repair sequences when the AI misunderstood them.

Thematic Analysis was used to code the student reflective journals, the classroom observation notes, and the teacher interview transcript. The researcher read through the text multiple times to find recurring patterns. These codes were synthesized into overarching themes regarding the students' affective changes, the empathy deficit of the AI, and the efficacy of the teacher's non-verbal scaffolding.

Trustworthiness was maintained through data triangulation, as the objective conversation logs were cross-verified against the subjective learner reflections, the classroom observations, and the expert teacher evaluations. Ethical standards were strictly observed throughout the process. All participants provided informed consent, and all personal data were completely anonymized to protect their privacy.

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3. Results and discussion

3.1. AI's impact on verbal IC dimensions

Data from the college volunteers indicated that autonomous AI practice effectively targeted basic verbal dimensions of Interactional Competence. The most immediate benefit observed was the substantial reduction in foreign language speaking anxiety. Student 5 reported that AI completely removed the pressure typically felt in human conversations. The student noted that they could stop and think about their grammar without the embarrassment caused by long, awkward pauses. This low-stress environment allowed the learners to focus on their linguistic output rather than their fear of negative evaluation [6]. Thus, the students produced a considerable number of conversational turns, a finding that aligns closely with the core principles of the Output Hypothesis [7].

This consistent, low-pressure practice directly improved the learners' ability to manage topics and turns. In the early stages of the experiment, participants often waited passively for the AI to pose the next question. As they grew accustomed to the tool, they began to actively navigate the conversational flow. A clear example occurred when AI abruptly shifted a discussion away from job resumes and started talking about dealing with difficult teammates. Student 2 immediately recognized the weird deviation and reclaimed control of the topic, by typing, "wait. we are talking about resume, right? why are we discussing teammates?". This specific interaction demonstrates a significant shift from being a passive responder to an active topic manager.

Students also utilized simple questions to repair breakdowns in understanding. When confronted with the unfamiliar idiom "bite the bullet," Student 2 effectively paused the conversation to ask for clarification, stating, "sorry, what do you mean by bite the bullet?". These findings suggest that AI provides a highly functional space for learners to practice basic sequential organization and breakdown repair without the traditional affective barriers [8]. They can test their vocabulary and fix their mistakes in a safe environment before trying them out on real people.

3.2. The empathy and non-verbal gap in AI

Despite the linguistic improvements observed during the autonomous practice, the qualitative data clearly exposed the limitations of AI in non-verbal communication. Genuine interactional competence is a multimodal achievement that relies on physical presence and emotional resonance [9]. The textual analysis revealed that while AI can generate conversational fillers to simulate active listening, these attempts were frequently perceived as unnatural. For instance, the classroom observation notes indicated that the AI's use of phrases like "uh-huh" felt rigid and mechanical to the users. Student 1 similarly reflected that the AI's feedback lacked the smooth, natural contingency expected in human dialogue.

This empathy deficit became highly problematic when students discussed sensitive personal issues. Student 4 used the AI to vent about severe emotional distress regarding a friend's bereaved family and the overwhelming pressure of university rejections. When the student sought emotional comfort, the AI provided perfectly structured, highly logical psychological advice. Frustrated by this cold, analytical response, Student 4 erupted, "You stupid AI. You don't learn what emotion is and what our feeling are."

The high school teacher corroborated this phenomenon during the interview. She observed that the AI can only objectively preach reasoning and fails to provide empathetic comfort. These interactions confirm that AI operates on semantic prediction rather than human consciousness. It cannot offer an empathetic pause, a change in vocal tone, or a comforting physical gesture. Relying

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exclusively on AI tools leaves a critical gap in the sociopragmatic dimensions of IC, as machines cannot evaluate the emotional weight or the appropriate boundaries of human speech [10]. When learners are confronted with real stress, they need a partner who can share that emotional weight, not just process the words.

3.3. The critical role of teacher intervention

Classroom observations during the high school workshop demonstrated that teacher intervention is essential to bridge the gaps left by AI. Interactional competence requires participants to coordinate their bodies and language within a shared physical space [11]. During the initial autonomous AI practice phase, the students exhibited zero non-verbal engagement. The observation notes recorded that students kept their heads down, staring entirely at their phone screens. They were essentially interacting with a text box rather than practicing social communication.

The pedagogical turning point occurred when the teacher actively stepped in to provide physical scaffolding. The teacher explicitly modeled the non-verbal behaviors that AI could never demonstrate. Specifically, the teacher showed the students how to maintain eye contact, offer natural smiles, use appropriate hand gestures, and adopt a forward-leaning posture to signal active listening.

This physical intervention transformed students' learning experience during the human-to-human role-play phase. Having already practiced target vocabulary and grammatical structures with AI, students could dedicate their cognitive resources to their physical presence. The teacher noted a massive shift in classroom behavior, observing that students could actively make eye contact with their partners. Students also began using hand gestures to emphasize their points and learned to control their facial expressions during mild disagreements. The teacher summarized her own indispensable value by stating that AI solves the problem of speaking, while teacher intervention solves the problem of actual communication. This phase confirms that a human educator is strictly necessary to teach the social etiquette and emotional expression that algorithms lack [5].

3.4. Synergistic classroom effects

The synthesis of the qualitative data illustrates the powerful synergistic effect of combining conversational AI with human pedagogy. This model successfully eradicated the silence typical of EFL classes by providing every student with a non-judgmental speaking partner [12].

The success of this approach lies in a highly effective division of labor. AI undertook high-frequency, repetitive language practice and delivered instant, individualized corrections on prepositions and verb tenses, a task that a single teacher cannot realistically perform for dozens of students simultaneously. This mechanical repetition eliminated the students' fear and built a solid linguistic foundation. The teacher then transformed this foundational practice into authentic social interaction by teaching non-verbal guidance and pragmatic depth.

As the teacher explained, students first overcome their fear in the low-pressure AI environment. Then, through the teacher's physical guidance, they land in authentic interpersonal dialogue. This dual approach ensures improvements in both language mechanics and social interaction. The students themselves recognized this necessity. During their reflections, they viewed the AI as an excellent entry-level tool to build basic courage, but they explicitly preferred the teacher to systematically explain interactional techniques for the real world. Ultimately, the integration of AI mediates the learning process, but the human teacher remains the crucial guide scaffolding the social and emotional development of the learners [13].

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4. Conclusion

This study investigated the synergistic effects of combining conversational artificial intelligence with human teacher intervention on the development of L2 interactional competence. Through a two-phase qualitative design, the research demonstrates that AI serves as a highly effective tool for lowering speaking anxiety and providing a safe space for high-frequency linguistic practice. Students can test out vocabulary and practice basic turn-taking without the fear of losing face in front of their peers. However, the findings also revealed that current AI fundamentally lacks physical embodiment and genuine human emotion, making it unable to teach non-verbal behaviors or deep interactive listening.

The major contribution of this research lies in proposing a practical human-machine collaborative teaching model. This model highlights a clear division of labor. AI should handle repetitive linguistic training, freeing the human educator to focus on the social, physical, and emotional aspects of authentic communication. Teachers are needed to model eye contact, body language, and empathetic responses, ensuring that students learn how to connect with real people, not just algorithms.

Despite these positive findings, this study has several limitations that must be acknowledged. First, the research was conducted with a small sample size, involving only five college volunteers and one high-school workshop group. This small scale naturally limits the broad applicability of the results. Second, the study adopted a purely qualitative approach based on interaction logs, observations, and interviews. While this provided deep insights into the learning process and the students' emotional states, it lacked quantitative surveys or objective assessments to measure the exact degree of linguistic improvement. To improve upon this, future research should incorporate mixed-methods designs with much larger participant groups.

Looking ahead, the integration of technology in language education holds immense potential. As artificial intelligence continues to evolve, the field will likely see the development of multimodal systems capable of recognizing voice tones and facial expressions. However, this study strongly suggests that the ultimate goal of language learning is human connection. Future classrooms will ideally feature a balanced synergy where technology mediates foundational practice and teachers orchestrate genuine social interaction. By embracing this collaborative approach, educators can cultivate confident learners who are truly ready to engage meaningfully in the real world.

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