

Investigating Socio Pragmatic Competence Development within Immersive Metaverse Based Language Learning Environments

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Abstract: With the advancement of immersive technologies, the Metaverse has made substantial contributions to how languages are learned. These technologies create situational environments that facilitate the communication of an enhancement of an individual's linguistic competence. However, the development of an individual's socio-pragmatic competence, which is the ability to utilize language in a socially appropriate manner, has not received a lot of attention. This study aims to analyze the metaverse's immersive approach to facilitating an individual's socio-pragmatic competence. Undergraduate English language learners are the target group of this study. The data were collected by analyzing learners' interactions through documentation and interviews after participants completed the interventions. The metaverse platform provided participants with a unique social experience through the use of avatars, enabling them to engage in social linguistic interactions and exchanges. The data indicated that the learners were remarkably more aware of the linguistic functions of politeness, turn-taking, and appropriate language. The metaverse enhanced the learner's socio-pragmatic competence, thereby reducing anxiety about communication and fostering more natural patterns of communication. The study suggests that the use of metaverse technologies in an immersive language-learning approach should become more common in language-learning environments. The metaverse should be used to support language learning, helping learners develop proficiency in the target language more effectively. The study aims to help educators understand the importance of metaverse technologies in creating adaptable learning environments that foster positive learning outcomes.

Key Words: socio-pragmatic competence, metaverse-based learning, immersive language learning, pragmatic development, virtual learning environments, communicative competence, digital language pedagogy

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Introduction

The Metaverse has continued to build on what recent technological advances in language learning have enabled, from an offline classroom to an assisted-learning environment, and now to a virtual one. Early forms of language-learning software assisted language learners only in acquiring vocabulary and

grammatical structures. Now, thanks to the most recent technological developments in virtual realities and multi-user environments, learners can take part in richly contextualized, immersive, meaning-focused, and interactive tasks. Such environments recreate realistic spoken communicative settings with avatars, immersive presence, and real-time interaction, changing the practice and experience of language learning (Mourtzis & Mystakidis, 2022; Damaševičius & Sidekerskienė, 2024). Literature reviews confirm that newer Metaverse platforms focus on collaboration and experiential learning rather than passive knowledge acquisition (Tong et al., 2025). Additionally, recent studies have shown that, unlike the learning of communication skills in traditionally used learning platforms and means, learning in the VR-based Metaverse also improves students' more general and portable communication skills through enactment (Muthmainnah et al., 2025).

In light of the above, we can see how socio-pragmatic competence has become a crucial linguistic aspect in today's globalized, technologically integrated world. It can be defined as the ability to use language appropriately in a given social context, norm, or culture. Hence, beyond having the ability to use language accurately, one should also consider having the communicative competence to use language with an appropriate register and politeness to a certain social setting. Immersive technologies like virtual reality offer meaningful, educational, and social experiences that learners can take advantage of to practice their socio-pragmatic competence. There is an evidence to show that virtual worlds can improve learners' knowledge of socio-pragmatic and cross-cultural competences (Morady Moghaddam & Mirfendereski, 2025; Valizadeh & Morady Moghaddam, 2025). However, these digital educative means have not shown the same socio-pragmatic competence development.

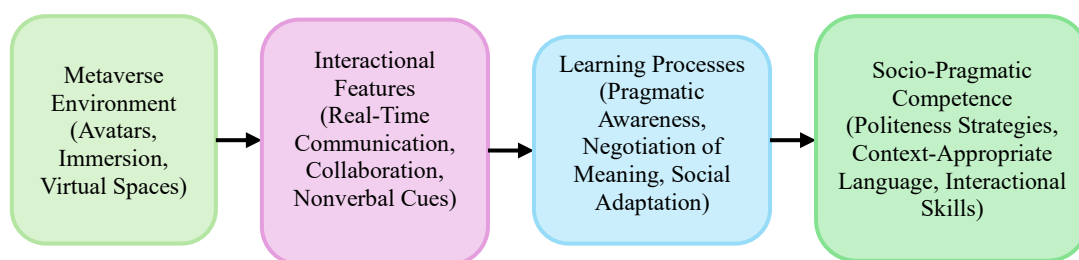


Figure 1: Conceptual Framework for Socio-Pragmatic Competence Development in Metaverse-Based Learning

Figure 1 presents the stages through which immersive metaverse environments support the development of socio-pragmatic competence. Specifically, it summarizes the role of avatars, immersion, and virtual environments in terms of real-time communication, collaboration, and nonverbal interaction. These interactions facilitate pragmatic awareness, meaning negotiation, social adjustment, and, ultimately socio-pragmatic competence development. This is evidenced by learners' use of politeness strategies, appropriate language according to context, and capable interaction in communication.

Since the use of immersive technologies has been on the rise, one of the existing challenges is the vast majority of digital language learning applications neglect features that consist of social and contextual aspects of language use. Even with the use of advanced technologies, social interaction still lacks and is overshadowed by the target-oriented nature of the interaction, which reduces the chances of acquiring the skills of authentic pragmatic use. Participatory activities of the Metaverse have been beneficial in enhancing communicative competence, but the development of the target socio-pragmatic skills is still lacking as affirmed by researchers (Tan et al., 2024; Shin et al., 2025). Because of this imbalance, one wonders to what extent learners transfer the language skills attained to real-life communication.

This is the challenge that current research tries to answer. The literature exists in abundance when it comes to recent studies on learning possibilities offered by digital virtual reality and metaverse technologies, but still, very little has been written about the implications of these technologies on practitioners' socio-pragmatic competence. There is a need for more research on what the current systematic and narrative reviews have identified as gaps pertaining to the pragmatic aspects of learning in immersive environments (Tegoan et al., 2025; Wiboolyasarini et al., 2025). Thus, the need of the hour is to investigate both how learners interact in such environments and how well they do so in a socially adequate manner.

Given this context, this research attempts to analyze how socio-pragmatic competences are developed in meta-verse-based immersive language-learning environments. The authors attempt to understand how such environments aid learners in understanding and practicing language in context-based environments. The research intends to answer the following questions: (Morady Moghaddam & Mirfendereski, 2025) What is the impact of metaverse environments on learners' socio-pragmatic competence? (Tan et al., 2024) Which interactional elements in the metaverse aid in the development of pragmatic competence?

This research is the first of its kind to attempt to understand the socio-pragmatic competence of learners in a virtual learning setting, thus addressing the gaps in language learning research. The need to assess the socially appropriate language use behaviors remains as the immersive technologies continue to evolve in language teaching.

This paper adds to the scant literature on socio-pragmatic competence in metaverse environments, and provides some ideas on how to use immersive technologies in the teaching of language while placing emphasis on teaching socially and contextually appropriate language use.

The rest of this paper will be structured in the following manner. Section II contains the literature review and the theoretical framework relevant to the study. Section III describes the research process and design, participants, instruments, and data analysis. Section IV presents the analysis key findings. Section V discusses the findings in relation to previously discussed literature, and presents the findings pedagogically and technologically. Section VI provides the conclusion, restating the key contributions of the study and the recommendations for future research.

Literature Review

Socio-pragmatic competence allows for social appropriate communication with consideration to available cognitive resources and cultural context. Vygotsky's social cognitive approach broadens theory outside of Hymes and considers learning as social. In today's predominantly digital social communication environments, this type of competence is crucial, as there's a gap in the literature on how technology fosters communicative competence (Baimakhan et al., 2024). From a sociocultural perspective, Vygotsky emphasizes the importance of social interaction and mediated learning for cognitive development. Learning is social in this context, and communicative meaning is formed in interaction. Immersive environments are ideally suited for this framework, as they allow for collaborative scaffolding of engagement in interaction in simulated contexts. Real-time communication and presence increases co-presence, which allows learners to use language socially in a meaningful way. These environments employ a mixture of verbal and non-verbal communication, such as gestures and positioning, which are integral to the environment and contribute to the development of pragmatics (Xenakis et al., 2022). In recent years, immersive and metaverse technologies have been more frequently integrated into language education, providing

experiential learning opportunities beyond the conventional confines of the classroom. Metaverse environments facilitate active, learner-centered, interactive, and above all, much more motivating learning experiences (Beck et al., 2023). Further, some proposals have suggested certain models of immersive learning combined with the CEFR and other frameworks to provide meaningful language learning opportunities within the confines of a virtual world (Demirdöven, 2025). Such environments have also been shown to improve learners' attitudes towards learning and their performance in learning, especially with respect to vocabulary learning and communication skills (Wang et al., 2025). In addition, the integration of AI technologies in metaverse environments has created even more opportunities for personalizing and contextualizing language learning (Lee et al., 2025). Prior research has consistently shown the educational benefits of virtual environments. Extended reality applications have been shown to support language learning for particular purposes through the provision of authentic, task-based language learning opportunities (Christou et al., 2025). Beyond technical affordances, the metaverse has also been conceptualised as a humanising space that supports sustainable and meaningful language learning experiences, emphasizing learner identity and social presence (Kern, 2024). In the same way, immersive environments have been associated with greater learner involvement, acceptance, and continuous engagement, all of which are vital for achieving learning objectives (Di Natale et al., 2024). In a variety of practical settings, such as film making and professional learning, communication within the metaverse has resulted in improved both language and workplace communication skills (Piayura et al., 2024). These results indicate that immersive environments have the capability of providing experiential learning opportunities when the theoretical aspects of language learning are not adequate. Progress has been made, but literature has cleared little ground. Many studies look at general communicative competence and the construction of technologies, but very few focus on methods of development on socio-pragmatic competence in immersive metaverse environments. Most research studies focus on performance results or user perceptions, while the research on the pragmatic elements of interactions is largely missing. More of this type of investigation ought to explore how learners manage the meaning, contextual adaptation of language, and social strategizing in virtual environments. The current study is located within this theoretical framework, and the authors attempt to use communicative competence and socio-cultural theory to analyze socio-pragmatic development within metaverse learning. It conceptualizes immersive environments as socially mediated spaces. In socially mediated environments, interaction determines how language use is structured. By focusing on the pragmatic aspects of communication, this study aims to broaden the current research focus beyond structural and functional outcomes of language.

The literature reiterates the benefits of interactive technologies in language learning, especially when it comes to engagement and collaboration. Yet, it critiques the research focus; the socio-pragmatic aspects remain underexplored. This study addresses this concern by attempting to provide a better understanding of communicative competence in digital contexts by examining how immersive metaverse environments facilitate the use of socially and contextually appropriate language.

Methodology

Research Design

This study utilizes a mixed-methods approach to better understand the evolution of socio-pragmatic competence in an immersive metaverse-based language learning environment. The integration of qualitative and quantitative methods captures the depth of interplay of interaction control and the measurable patterns associated with pragmatic development. The qualitative part looks at language in context, while the quantitative data corroborates the learner's trajectory.

Participants

The study engaged a total of 30 undergraduate students of the English language in a communication skills course in a tertiary institution. Using purposive sampling, the participants were ensured to have an intermediate level of proficiency and digital literacy. Before commencing the study, the participants underwent a metaverse training seminar to prepare them for the platform and its functions.

Metaverse Learning Environment

The study was carried out in the metaverse which allows communication of participants in real-time using avatars. The environment was designed to contain simulated social situations, which included academic environments, informal hangout spots, and other meeting areas, to facilitate participants in practicing the communication skills in real life. Participants were supported in their verbal and non-verbal communication using features like audio, gesture, and other spatial control.

Data Collection Instruments

Several instruments were used to synchronize data. Participant observation was used to record behavioral interactions and engagement during the sessions. Pragmatics-related conversational features were analyzed, including recording, courtesy strategies, conversation control, and context. Semi-structured interviews analyzed learners' views and perceptions. A questionnaire analyzed changes in self-reported socio-pragmatic awareness.

Study Procedure

The study spanned six weeks. Participants took part in structured communication exercises biweekly in the metaverse. Sessions were centered on specific socio-pragmatic skills like polite offers to initiate conversations and suitably expressing views across different social contexts. Learners were grouped into pairs and small teams, and instructor involvement was kept to a minimum to foster genuine communication. Every session was filmed for later review.

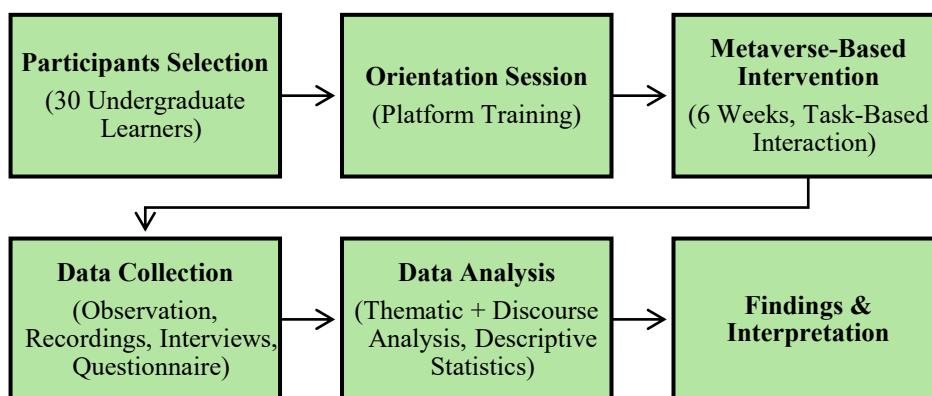


Figure 2: Research Design and Procedural Framework of the Study

Figure 2 depicts the steps taken in this study from the selection of participants and the orientation session designed to introduce the learners to the metaverse, to the implementation of a six-week metaverse intervention involving task-based interactions. It then shows the subsequent steps involving data collection using multiple tools, and data analysis through thematic, discourse and statistical approaches. The process

ends with the interpretation of results and indicates how each step helps to understand the complexity of the socio-pragmatic competence in the context of the immersive learning environment.

Methods of Data Analysis

Combination of qualitative and quantitative data was analyzed. Thematic and discourse analysis were used for Interaction transcript analysis and observation data to identify easily observable pragmatic features. Pragmatics-related elements like speech acts, politeness strategies, and context were used to guide coding structures. Learners' perceived development trends were analyzed using descriptive statistics. This multifaceted approach provided a detailed analysis of the metaverse environment's socio-pragmatic competence development.

Results / Findings

The interactional data, observation logs, and responses provided in-depth insight into the learners' developments in socio-pragmatic skills in the metaverse. The results are structured into four main themes.

Growth of Pragmatic Awareness

Increased awareness concerning the social contextualised varied usage of language was demonstrated by the participants. Many learners used direct and context-free utterances, but eventually, learners modified their language considering the social roles, the described settings, and the addressees involved in the utterances. The greatest change was significant in the task-based interactions, which required learners to enact real-life activities.

Example excerpt

“Can you give me that?” → later refined to → “Could you please pass that to me?”

This is indicative of the increase in social appropriateness and social subtlety sensitivity.

Use of Politeness Strategies

There was noticeable improvement in the use of indirect requests, mitigation expressions, and politeness markers. Increased use of softeners, such as, “please,” “could,” “would you mind” and the use of hedges in order to foster and protect the interpersonal relationships.

Example excerpt

“I disagree” → later refined to → “I see your point, but I think it might be better if...”

This shows that the learners employed more acceptable communication strategies as a result of the immersive environment.

Table 1: Usage Frequency of Politeness Strategies (Before vs. After)

| Politeness Feature | Pre-Interaction (%) | Post-Interaction (%) |
|---------------------|---------------------|----------------------|
| Use of “please” | 35% | 72% |
| Indirect requests | 28% | 65% |
| Hedging expressions | 18% | 54% |
| Agreement softeners | 22% | 60% |

Table 1 shows the comparative analysis of the learner's usage of Politeness strategies in the pre and post interventions. The Politeness Strategies Data shows a great impact as there is an apparent use of indirect requests, hedges, and softer agreements, signifying the move from direct communication to the more socially appropriate and desired communication. The increased use of the markers like, “please” and mitigated expressions shows that the immersive metaverse environment the learners developed a level of interpersonal sensitivity and, to a degree, psychological development.

Contextualised Communication

Improvement was noted in the learners' ability to tailor their language to contextual variables including formal discussions, peer interactions, and role play. The sessions demonstrated a gradual and evident ability to transition between formal and informal communication styles.

Example excerpt

In café setting: “Hey, what do you want?”

In formal setting: “What would you like to order, sir?”

Increased use of language resources was attributed to learners' diverse exposure to virtual situations.

Table 2: Appropriateness of Context in Language

| Context Type | Appropriate Responses (Pre) | Appropriate Responses (Post) |
|-----------------|-----------------------------|------------------------------|
| Formal | 40% | 78% |
| Informal | 62% | 85% |
| Role-play tasks | 45% | 80% |

This table 2 shows to what degree the learners were able to tailor their language in reference to the communicative context at hand, formal, informal, and role play. The findings very clearly indicate improvement in context-sensitive responses, more especially in the formal and role play interactions. Clearly, more than ever, the learners are able to use the target language of their choice based on the context of the interaction, and most importantly, their sensitivity and comprehension of the expectations regarding language register has greatly developed.

Behavioral Interaction in Immersive Environments

The metaverse created more varied forms of interaction. For example, learners had longer dialogues, better turn-taking, used more nonverbal communication (like gestures and avatar position), and demonstrated how presence can reduce uncertainty. This presence seems to increase the level of contribution.

Example excerpt

“Sorry, you go ahead...” (turn-taking repair)

“Oh, I didn't catch that—can you repeat?” (clarification strategy)

All of the above shows a more fluid speech and natural communication that can be found in reality.

Table 3: Interactional Features Documented

| Feature | Early Sessions | Later Sessions |
|---------------------------|----------------|----------------|
| Turn-taking interruptions | High | Reduced |
| Clarification requests | Low | Increased |
| Length of interactions | Short | Extended |
| Nonverbal engagement | Minimal | Frequent |

This table 3 gives the most important interactions during the first and second stages of the study. The findings have shown there has been a shift from having no participation at all to full participation. There is no doubt that the less the interruptions, and more the clarifying questions and non-verbal communication, depicted that the learners employed more sophisticated management of interaction control in the Immersive environment.

It seems that the immersive nature of metaverse environments creates better opportunities for learners to grow socio-pragmatic development. In terms of linguistic choices and interactional/community awareness and sensitivity, there are improvements that indicate a better overall development in communication skills.

Discussion & Implications

Findings show that the metaverse gives the ability to practice social language outside the social context; so the environments are suggested to develop socio-pragmatic competence. Interpreted through the prism of Dell Hymes, learners moved from a focus on grammatical accuracy to situationally relevant communication, especially regarding politeness and interactional approaches. Consequently, from the Lev Vygotsky angle, the metaverse served as a social mediation space, wherein meaning was derived through communication; thus, the internalization of the relevant norms of pragmatics was achieved. These results are consistent with earlier studies that have focused on immersion as a proven technique to enhance communication skills, although this time the focus was on the socio-pragmatic component. Anxiety was correlated with higher engagement and a more consistent communication pattern, owing to the avatars, immersive environments, and real-time communication. This also created an environment in which learners had the opportunity to practice language. The study contributes to important pedagogical implications and suggests the use of metaverse-based activities in language teaching to foster situationally relevant, authentic communication. When it comes to design, the focus of the platforms used should be on the interactive, socially purposeful, and pragmatic features. Short period of time and small number of samples are the most significant limitations of the study. In the context of language education, the potential of immersive environments should be grasped, and this suggests future studies with a variety of learning situations as well as longitudinal studies.

Conclusion

The aim of this research is to understand how metaverse immersive environments assist in building sociopragmatic competence in learners of English as a foreign language. The results show that immersive environments allow learners to practice communication in specific contexts, and that this practice is reflected in the improvement of their awareness of pragmatics, politeness, and turn-taking. The learners began to communicate in a way that was not only correct in language structure, but also sensitive to the context and appropriate socially. The research shows the impact of immersive environments in the social development of communication. It places the use of the language in varied and socially interactive virtual situations, which shed light on the professional use of languages in the context of digital, immersive, and

remote language learning. The research responds to a gap in socio-pragmatic competence concerning the use of the language in digital remote learning environments, and provides to the increased studies of immersive language learning by proposing the use of metaverse elements of avatars, and real-time interactions as a means of enhancing not only the engagement of learners but also their communicative competence. It demonstrates the value of integrating immersive technology into language pedagogy. Therefore, there is a need for studies that investigate the long-term effects of the use of metaverse technology in varied and relevant language learning environments, to guarantee that language learning environments remain innovative and pedagogically effective.

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