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# Effects of communication mode on EFL learners' engagement and request learning

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This study examines how different communication modes (two kinds of computer-mediated communication and face-to-face mode) influence EFL learners' engagement during a collaborative writing task and its impact on subsequent request learning outcomes, measured by sociopragmatic and pragmalinguistic competence. Ninety-six high school English learners were assigned to groups for text-based chat, audio chat, and face-to-face interactions to complete a collaborative writing task in pairs. Two versions of the Written Discourse Completion Test (WDCT) were employed as pre-tests and post-tests to assess and compare the learning outcomes in request-making across the three groups. Cognitive and social engagement of learners were assessed by using multiple measures derived from chat logs and recordings, while a post-task questionnaire was utilized to gauge emotional engagement during the task. The results indicated that learners in the face-to-face and audio-chat conditions demonstrated higher levels of cognitive engagement compared to the text-chat group. The text-chat group reported fewer instances of negative emotions. In terms of request learning outcomes, all groups showed an increase in sociolinguistic appropriateness; however, no significant differences were found in overall pragmalinguistic competence. Social and emotional engagement significantly correlated with sociopragmatic improvement in the audio-chat mode, yet these indicators did not demonstrate significant predictive power.

## KEYWORDS

computer-mediated communication (CMC), face-to-face communication, learners' engagement, request learning, collaborative writing task

## 1 Introduction

In the realm of pragmatics, the speech act of making requests is the most commonly used in our daily lives, yet it remains challenging for language learners to fully master. A lack of pragmalinguistic and sociopragmatic knowledge can lead to misunderstandings in communication (Thomas, 1983). Therefore, it is essential to impart pragmatic knowledge to learners of English as a Foreign Language (EFL learners). As EFL learners often lack the opportunity to develop pragmatic competence naturally through interaction with native speakers, formal instruction in the classroom continues to be the primary source for students to acquire knowledge related to the form-function-context mapping of language (Ajabshir, 2019; Taguchi, 2012, 2015).

Due to the time and space constraints of face-to-face interaction in traditional classrooms and the affordances offered by technology, the integration of technology into foreign language teaching has become an irreversible trend. Computer-mediated communication (CMC) has increasingly received interest and attention in its affordances for foreign language (FL) learners to carry out innovative pedagogic practices, and it is likely a powerful tool to enhance L2 pragmatics learning (González-Lloret, 2019, 2021). Some scholars have argued that task-based

instruction and computer technology can be integrated (see González-Lloret, 2019, 2020, 2022; González-Lloret and Ortega, 2014; Ziegler, 2016b), and examined how collaborative tasks in a computer-mediated context promoted the development in vocabulary (Smith, 2005), oral language proficiency (Payne and Whitney, 2002), and pragmatics learning (Kim and Taguchi, 2015; Tang, 2019). CMC was demonstrated to allow learners to have more negotiation for meaning in peer interaction and pay attention to the target forms, which resulted in greater learning achievement (Blake, 2000; Smith, 2005). However, research on the application of CMC in pragmatics learning is still very limited.

In addition, while previous research has primarily focused on learners' task outputs and language learning outcomes in computer-mediated communication (CMC) contexts (e.g., AbuSeileek and Qatawneh, 2013; Ajabshir, 2019; Sykes, 2005), as well as the interaction characteristics during task communication (e.g., Blake, 2000; Smith, 2005), there has been limited attention paid to learners' affective (or emotional) and social performance during task-based interactions. To understand the affective and social aspects of learners' performance, their engagement is crucial. Engagement is a concept that encompasses a state of heightened attention and involvement across cognitive, social, behavioral, and affective dimensions, and it plays a crucial role in driving students' learning processes (Philp and Duchesne, 2016). It is also considered an essential ingredient for promoting effective learning experiences and ensuring quality instruction (Hiver et al., 2021). Therefore, it is important to investigate how CMC affects learners' engagement during interaction. Meanwhile, more studies have been related to text-based CMC modalities, while other modes such as video and audio chat modalities have been relatively under-researched (e.g., Lee, 2007; Qiu, 2022; Yanguas, 2012; Ziegler and Phung, 2019). Thus, this study took the emotional and social aspects into account and explored the effects of communication modality on English learners' request language acquisition from the perspective of learners' engagement, including cognitive, emotional, and social engagement. Consequently, the current study aimed to compare different CMC modes with the face-to-face (FTF) mode and investigate their impacts on EFL learners' engagement in interaction and their subsequent outcomes in request language learning.

## 2 Literature review

### 2.1 CMC and language learning

Computer-mediated communication (CMC), born with the rapid development of computers and Internet technology in the new era, is a new mode of communication that plays a crucial role in distance language learning. Over the past two decades, research on CMC has become a hot topic in the field of Computer-assisted Language Learning (CALL), facilitating collaborative task-based interaction between learners. Researchers have begun to combine remote collaboration with task-based teaching, recognizing that tasks have a potential facilitating effect on language teaching (González-Lloret, 2022). Early studies found that text-based CMC has unique merits and is often better at facilitating second language learning than face-to-face (FTF) communication. By comparing learners' interactional or language performances in collaborative tasks in CMC and FTF mode, the studies illustrated positive impact of CMC on various aspects of

second language (L2) learning, such as vocabulary learning (Smith, 2005), L2 pragmatics learning (Sykes, 2005), linguistic complexity and lexical diversity (Sauro and Smith, 2010), and oral competency (Abrams, 2003) etc. The research identified several advantages of text-based CMC for L2 development: (a) provide more opportunities for meaning negotiation, (b) allow learners to pay more attention to the target language, (c) offer more planning time to mobilize cognitive resources during interaction, (d) facilitate more equal communication among participation, (e) reduce communication anxiety (Blake, 2000; Smith, 2005; Sykes, 2005; Abrams, 2003; Storch, 2008).

However, some studies comparing CMC and FTF on task-based peer interaction and learning outcomes have displayed inconsistent results (e.g., Carver et al., 2021; Gurzynski-Weiss and Baralt, 2014; Tang, 2019), highlighting the need for further investigation. For instance, the findings of Tang's (2019) study indicated that FTF learners outperformed their CMC counterparts in a decision-making task in learning Chinese modal verbs, as evidenced by a higher frequency of modal verb production during interactions. Similarly, by comparing the effects of FTF and CMC on Spanish L2 learners engaged in an information-gap task, Gurzynski-Weiss and Baralt (2014) found that students in the FTF mode produced more modified output in their interactions compared to those using CMC.

Despite findings that suggest differences in the effectiveness of CMC and FTF modalities, limitations in the existing research indicate that a definitive comparison is not yet possible. This calls for further research that addresses these limitations and offers a more comprehensive understanding of how these modalities impact language learning outcomes. Moreover, the emotional and social aspects of learners' performance during computer-mediated interactions have been understudied (Aubrey, 2022; Lambert et al., 2017; Dao et al., 2021; Qiu and Lo, 2016). Additionally, while there is a substantial body of research on text-based CMC, studies exploring other modalities, such as video or voice chat, are comparatively scarce (Lee, 2007; Sykes, 2005; Yanguas, 2010, 2012; York et al., 2020; Ziegler and Phung, 2019).

Taking social and emotional factors into account, this study intends to extend the previous research that has explored the effects of different CMC modes (i.e., synchronous text chat and synchronous audio chat) on English learners' acquisition of request speech act from the perspective of learner engagement.

### 2.2 Learner engagement and task-based peer interaction in FTF and SCMC

Philp and Duchesne (2016) conceptualized the notion of learner engagement from the task-based perspective as well as specific measuring indicators and defined engagement as "a state of highly attention and involvement, in which participation is reflected not only in the cognitive dimension, but in the social, behavioral and affective dimensions" (p. 51). Cognitive engagement is the focused mental effort during learning, shown by verbal interactions like sharing and evaluating ideas, directing, explaining, justifying and questioning (Helme and Clarke, 2001; Lambert et al., 2017). Social engagement is about learners' connectedness and participation, indicated by participants' responsiveness by providing backchannel comments, encouragement, and mutual help (Damon and Phelps, 1989; Storch, 2008). Emotional engagement relates to a learner's motivation and

emotional investment, which can be positive or negative (Philp and Duchesne, 2016). Behavioral engagement is the level and quality of participation, often measured by time spent and contributions made (Lambert et al., 2017). These dimensions interact, revealing the complexity of engagement. It may be influenced by many factors, such as the type of SCMC, the familiarity between conversation partners, the proficiency level in a second language, and the frequency of task repetition (Namkung and Kim, 2024). This study focuses on capturing learners' engagement across cognitive, emotional, and social dimensions, as social and emotional engagement can be observed in their learning outputs (Dao and McDonough, 2018; Dao et al., 2021).

With the advent of online learning, learner's peer interaction for foreign language learning in digital platforms has gained increasing prevalence across diverse educational contexts. Many researchers have examined how task design or implementation features affect learners' engaging performance in completing tasks, including content familiarity and task repetition (Qiu and Lo, 2016), task content (Lambert et al., 2017), task preference (Phung, 2017), and proficiency pairing (Dao and McDonough, 2018). Notably, prior empirical studies related to learner engagement in task-based learning have mostly been conducted in traditional classroom settings, with little attention paid to task-based peer engagement across various instructional environments. Particularly, relatively few studies have focused on learner engagement in interactions in the context of computer-mediated communication (e.g., Baralt et al., 2016). However, these studies just examined the effects of implementation conditions on different aspects of task engagement; they did not consider the effects of engagement on L2 learning.

Drawing on Maehr's (1984) Personal Investment Theory (as cited in Lambert et al., 2017), personal investment in the learning process, including the time, talent, and energy invested, as well as their willingness, is expected to have a concrete impact on their performance during the task-based interaction, which may result in varying learning outcomes. Some research on L2 interaction has explored the potential link between interaction and subsequent L2 production or development. For example, positive emotional engagement has been found to positively correlate with increased L2 production (Dao and Sato, 2021). The inner emotional engagement was identified as the predictor of learning outcomes (Carver et al., 2021). Furthermore, higher levels of cognitive and social engagement were associated with improved text quality (Dao et al., 2021; Phan and Dao, 2023). Although learner engagement has demonstrated its influences on learning, limited research has explored the potential impact of learner engagement during interaction in diverse communication modes (e.g., audio-based communication) on pragmatic learning. To fill the gap, the current study also examined the association between multifaceted engagement and pragmatic learning, particularly focusing on requesting behavior.

### 3 Research questions

To investigate the impact of communication modes on learners' engagement in task-based interaction and the effectiveness of these modes in promoting pragmatic task-based learning, this study explored whether there were differences in learners' engagement during the task process under different communication modes. It used language-related episodes (LREs) as an indicator of cognitive

engagement, responsiveness from the interaction as an indicator of social engagement, and questionnaires to measure emotional engagement. The study then further explored whether there were significant differences in the learning outcomes of English learners' request pragmatic knowledge (i.e., request strategies) under different communication conditions through a pre-post comparison of written discourse completion tests. Finally, it investigated how engagement was related to the learning gains of request pragmatic knowledge by conducting a correlation analysis. The following research questions are generated:

RQ1: What impact do different communication modes (CMC text chat vs. CMC audio chat vs. FTF chat) have on high school English learners' engagement level (cognitive, social, or emotional) during task interactions?

RQ2: What impact do different communication modes (CMC text chat vs. CMC audio chat vs. FTF chat) have on high school English learners' learning of requests?

RQ3: Is the level of learners' engagement in the task associated with subsequent variation in request learning outcomes?

## 4 Materials and methods

### 4.1 Participants

The participants in this study were 96 Grade 10 students (59 females and 37 males) from three intact classes at a Chinese high school. Their average age is 15.21 years old. Based on the original class setting, the participants were divided into three groups: text-chat group ( $n=32$ ), audio-chat group ( $n=32$ ), and FTF group ( $n=32$ ). Each group contains 16 dyads. In order to minimize the impact of prior English proficiency on the results, the average scores of three recent English tests for the text-chat group ( $M=95.55$ ;  $SD=8.40$ ), the audio-chat group ( $M=91.31$ ;  $SD=11.77$ ), and the FTF group ( $M=95.63$ ;  $SD=10.275$ ) was calculated. ANOVA result showed that there was no significant difference in the scores among the three groups ( $F=1.863$ ,  $df=2$ ,  $p=0.161$ ), suggesting that they were regarded at the same English proficiency level.

### 4.2 Design

A between-group mixed-method design was implemented to examine the effect of different communication modes on learner engagement (RQ1) and learning of request expressions (RQ2), as well as the association between learner engagement and subsequent learning outcomes (RQ3).

One of the variables in this study was communication modes, which included synchronous text chat, synchronous audio chat, and traditional face-to-face communication. Since this study focused on task-based performance, it adopted Philp and Duchesne's (2016) framework of task engagement. Learner engagement, a multidimensional construct, was measured through three subcomponents: cognitive, emotional, and social engagement. Cognitive engagement, which refers to the learners' focus on task

completion, was measured by the number of language-related episodes (LREs). LREs are defined as “any part of a dialog where the students talk about the language they are producing, question their language use, or correct themselves or others” (Swain and Lapkin, 1998, p. 326). Social engagement was operationalized by the degree of participants’ responsiveness to their partners, including behaviors such as offering help, encouraging, and responding to each other etc. Emotional engagement was assessed through participants’ self-reported feelings during interaction in the questionnaire by using a five-point Likert rating scale.

Regarding the learning outcomes of the request, two aspects of competence were considered: sociopragmatic and pragmalinguistic competence (Thomas, 1983). Appropriateness scores served as the indicator of sociopragmatic competence. Following Ajabshir (2019), the frequency of indirect request strategies in upward situations was used to gauge pragmalinguistic competence.

## 4.3 Instruments

### 4.3.1 Questionnaire

To address the first research question, the study drew upon the previous research (e.g., Dao and McDonough, 2018; Dao et al., 2021; Lambert et al., 2017) and employed a questionnaire to measure learners’ reported emotional engagement. The questionnaire from Dao et al. (2021) was specifically adopted due to its inclusion of items that assess both positive feelings (e.g., enjoyment, enthusiasm or interest in the topic or task) and negative feelings (e.g., anxiety, boredom, discouragement, or disconnectedness with peers). The questionnaire consisted of 10 items, with the first five targeting positive feelings, and the last five items targeting negative feelings. Learners indicated their level of agreement with the statements on a five-point scale ranging from 1 (“strongly disagree”) to 5 (“strongly agree”). To ensure the reliability of the questionnaire items, Cronbach’s alpha coefficients were calculated as 0.885 for positive feelings and 0.923 for negative feelings.

### 4.3.2 Written discourse completion test (WDCT)

To address the second research question, the written discourse completion test (WDCT) was adopted to elicit learners’ request expressions data in both the pretest and posttest. As stated in Brown and Levinson’s (1987, p. 74) Politeness Theory, certain contextual variables, including the relative power between interlocutors (P), the social distance (D), and the ranking of imposition (R), impact the realization of requests. Speakers are inclined to use more polite strategies to mitigate the threat posed by requests. Specifically, high-imposition contexts are more likely to prompt learners to use request strategies, thereby allowing for an assessment of their pragmatic competence. Consequently, the target situations in the WDCTs were designed to be high-imposition requesting scenarios, where the requests were operationalized with higher levels of imposition and directed toward individuals with greater social power and distance (Kim and Taguchi, 2015, 2016).

Fifteen scenarios, reflecting the real-life interaction, were selected from the DCT questionnaires in previous research (Li, 2019; Taguchi, 2012). These scenarios included nine PDR-high situations, such as asking the principal to retract an announcement, and six with low PDR, such as asking a classmate to lend a pen. To enhance the

relevance and familiarity of the scenarios to the participants, some items were adapted. For instance, the settings that were originally based on companies and colleges were changed to reflect a high school context, and the hypothetical relationships between employer and employee were modified to represent those between teachers and students.

To create the WDCT questionnaire with PDR-high situations that aligned with learners’ real-life experience, a pilot survey was conducted with 21 students from different class of the same grade. They rated the psychological difficulty of performing requests in given situations on a five-point Likert scale, ranging from 1 (“very easy”) to 5 (“very difficult”). They also assessed the perceived likelihood of these situations on another Likert scale from 1 (“least likely to happen”) to 5 (“most likely to happen”). From the PDR-high situations, eight items with a mean authenticity rating of 3.0 or above were selected as the target high-imposition scenarios, suggesting they were not uncommon in real life and were thus deemed acceptable (Li, 2019; Taguchi, 2012). The scenario with the highest difficulty rating was designed as the treatment task scenario, while the remaining seven were used in the pretest. The WDCT contained seven high-imposition request situations and two fillers – an appreciation speech act and a PDR-low request. A parallel version of the test was prepared for the posttest, incorporating different filler items, reversed interlocutor genders, randomized occurrence sequences, and minor modifications to proper nouns, while maintaining consistent contextual settings and variables with the original version. Cronbach’s alpha coefficients were 0.799 for the pretest version and 0.798 for the posttest version, indicating acceptable reliability.

### 4.3.3 Interview

To examine the EFL learners’ perceptions about CMC mode, a follow-up individual interview was conducted to explore their attitudes toward CMC and their perceptions of interaction and learning outcomes. Some students from each group voluntarily participated in the interview and answered questions adapted from Yanguas (2012), which were originally designed to examine attitudes and opinions about learning via Skype.

## 4.4 Target items

To assess pragmatic knowledge, this study targeted request strategies, which are mainly composed of two identifiable parts: a head act and supportive modification (Alcón-Soler et al., 2005; Blum-Kulka et al., 1989; Trosborg, 1995). The head act serves as the basic unit for conveying a request. For instruction and coding purposes, this study adopted Trosborg’s (1995) framework of request strategies, encompassing four main categories and eight sub-strategies (refer to Appendix A for details). The emphasis was on enhancing learners’ sociopragmatic appropriateness and pragmalinguistic indirectness in high-imposition contexts, characterized by high power, significant social distance, and a high degree of imposition.

## 4.5 Task treatment and materials

Drawing on the work of Kim and Taguchi (2015, 2016), a collaborative script writing task was implemented. Each dyadic pair

was tasked with co-editing and completing a reasonable story based on three comic pictures provided as situational prompts. Participants were given no additional guidance, requiring them to discuss with their partners and analyze the pictures, considering the characters' identities, power dynamics, social relationships, storylines, and potential dialogs, especially those involving requests. The purpose was to stimulate language production during task interactions. Following the pilot survey to select scenarios, the context with the highest reported difficulty was selected for the script writing task. In this scenario, a student is caught using a mobile phone in the dormitory against school rules, leading to the phone's confiscation by the teacher. The student's objective is to negotiate with the teacher for the return of the phone.

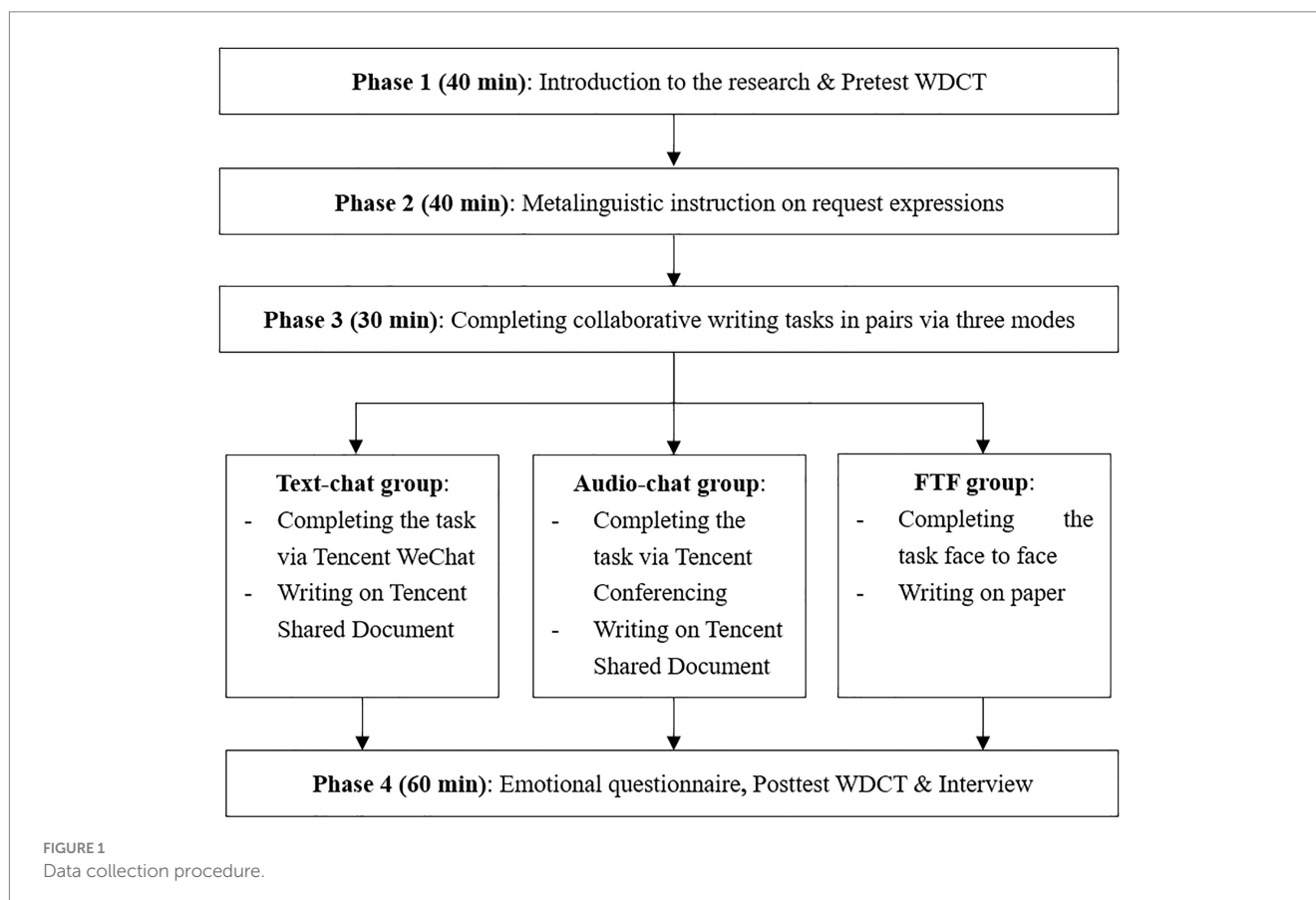
## 4.6 Data collection procedure

Data collection occurred in four phases, aligning with participants' schedules, as outlined in Figure 1. Initially, three intact classes were randomly assigned to text-chat, audio-chat, and face-to-face (FTF) groups. The research project was first presented, outlining its requirements and procedures, followed by administration of the pretest Written Discourse Completion Test (WDCT, version 1). During the instructional phase, participants received a 40-min metapragmatic tutorial on request strategies and modifications, presented in Chinese for enhanced understanding. Key elements of the hand-out were emphasized through input enhancements, such as bold and underlined text. Participants also engaged in written exercises to apply their

learning to hypothetical situations. In the task completion session, pairs collaborated on a scriptwriting task in a computer lab, using pictures provided (Appendix B) to create a story with dialogs within 30 min. They were encouraged to discuss in English but allowed to use Chinese if necessary. The Text-chat group communicated via Tencent WeChat, an instant messaging platform, while the Audio-chat group used Tencent Conferencing, a real-time online conferencing software with a screen recording function. Both CMC groups collaboratively edited the scripts on Tencent Shared Documents, allowing for simultaneous viewing of editing. And the FTF group worked together on paper. All interactions were recorded for later transcription. Following the task, participants completed a questionnaire on emotional engagement. The next day, a posttest WDCT assessed their learning of request strategies. To explore participants' attitudes toward CMC modes, post-task interviews were conducted with a subset of participants from each group, all of whom volunteered for the interviews. Additionally, text chat logs, as well as audio and video recordings of the interactions, were collected for analysis.

## 4.7 Coding

A total of 96 subjects participated in this study. However, three extremely invalid WDCT questionnaires and six invalid emotional engagement questionnaires that were not filled out in a standardized manner were excluded from the analysis. Thus, the final sample size for the analysis was 87 (29 for the text-chat group, 31 for the audio-chat group, and 27 for the FTF group).



Two raters evaluated the appropriateness of responses according to Taguchi's (2012) appropriateness rating scale (Appendix C) and identified the request strategies in both pre-and post-test WDCT. Except for two fillers, the score range for appropriateness was from 0 to 35 (5 points per item for a total of 7 items). Using the Pearson correlation coefficient, high overall inter-rater reliability was achieved, with  $r=0.927$  for the pre-test and  $r=0.907$  for the post-test. Any significant difference of two points or more was addressed until a consensus was reached, and the final score was determined by taking the average of the scores from both raters.

Regarding frequency, the two trained coders individually coded all target responses in the WDCT questionnaires manually according to the framework of request strategies proposed by Trosborg (1995). The agreement rate for each response reached 93.75% for the pretest and 94.79% for the posttest, respectively. The two raters would discuss divergent responses until finally reached an agreement.

With respect to the interactive data, all the voice recordings from two CMC groups were transcribed into texts using iFlyRec (XunfeiTingjian)<sup>1</sup>, a tool for transcribing from audio/video to text in multiple languages (e.g., English, Chinese, and Japanese). The authors later conducted a proofreading verbatim to correct the misrecognized words. Then the authors and another coder manually identified instances of LREs (cognitive engagement) and responsiveness (social engagement) in the transcripts according to Dao et al.'s (2021) framework. The coders identified all the recorded utterances independently. Pearson correlation coefficients showed high consistency, with  $r=0.989$  for the LREs and  $r=0.993$  for the responsiveness.

## 5 Results

### 5.1 Learner engagement

To address the first research question regarding the potential differences in engagement dimensions among text-chat, audio-chat, and FTF groups, descriptive statistics for normalized frequency of LREs and responsiveness, as well as self-reported assessment scores for emotional engagement are presented in Table 1. Table 2 displays the Kruskal–Wallis test results for engagement levels across the three modes.

In terms of cognitive engagement, learners in the Audio-chat group exhibited the highest frequency of LREs ( $M=0.084$ ,  $SD=0.185$ ), followed by the FTF group ( $M=0.064$ ,  $SD=0.032$ ), whereas text-based communication mode resulted in the lowest number of LREs during task interaction ( $M=0.014$ ,  $SD=0.029$ ). The Kruskal–Wallis test results in Table 2 demonstrated a significant difference in the frequency of LREs produced during the task among the three groups ( $H=17.832$ ,  $p<0.001$ ). Subsequent *post hoc* (Bonferroni-adjusted) pairwise comparisons (see Table 3) revealed that the Text-chat group had significantly fewer LREs than the other two groups. This indicates that students in the Text-chat group showed significantly lower engagement in the discussions about linguistic features, language use, and correction during the task compared to those in the Audio-chat group ( $p<0.001$ ) and the FTF group ( $p=0.023<0.05$ ).

Regarding social engagement, it was found that two CMC groups produced a greater number of responsiveness ( $M=0.114$ ,  $SD=0.091$  for the text-chat group,  $M=0.142$ ,  $SD=0.217$  for the audio-chat group) than the FTF group ( $M=0.083$ ,  $SD=0.032$ ). However, as shown in Table 2, the difference was not statistically significant ( $H=0.295$ ,  $p=0.863$ ).

The self-reported emotional engagement scores consisted of two dimensions: positive and negative emotions. All participants rated above 4 points on the positive emotions scale, with no significant difference observed in the mean scores across the three groups. However, a significant difference was found in the self-reported scores of negative emotions ( $H=6.081$ ,  $p=0.048<0.05$ ). The Text-chat group reported the lowest negative score ( $M=1.206$ ), followed by the Face-to-Face (FTF) group ( $M=1.375$ ). In contrast, the Audio-chat learners reported the highest mean score for negative emotion ( $M=1.562$ ). Follow-up pairwise (Bonferroni adjusted) comparisons, as shown in Table 3, showed that the scores for negative emotions in the text-chat group were significantly lower than those in the audio-chat group ( $p=0.042<0.05$ ), suggesting that the text-only conversation had the potential to reduce learners' negative emotions in the current study.

## 5.2 Learning outcomes of request

### 5.2.1 WDCT appropriateness scores

A quantitative analysis of the groups' WDCT posttest mean scores was conducted to compare the contextual appropriateness of the text-chat group, audio-chat group, and FTF group. Table 4 presents the descriptive statistics for the pretest and posttest scores in each group. The Shapiro–Wilk test indicated that the data for both pretest and posttest scores were normally distributed. The ANCOVA was performed to compare the post-test scores across groups. However, as shown in Table 5, no significant main effect for the Group was observed ( $F=0.826$ ,  $p=0.442$ ), indicating that there was no statically significant difference among the three groups in terms of sociopragmatic competence after the treatment.

In terms of within-group learning effects, a paired sample *T*-test revealed that students in all three groups had significant gains in the sociopragmatic appropriateness of requesting behaviors. Compared to the pretest, all groups performed better in the posttest (see Table 4). In general, the mean scores (*M*) of each group on the posttest were higher than those on the pretest (25.93 vs. 21.93 for the text-chat group, 26.06 vs. 22.26 for the audio-chat group, and 24.89 vs. 21.66 for FTF group). Table 6 illustrates that all groups scored significantly higher in the posttest than in the pretest ( $t=-4.713$ ,  $p<0.001$  for the text-chat group;  $t=-6.649$ ,  $p<0.001$  for the audio-chat group; and  $t=-3.466$ ,  $p<0.001$  for the FTF group).

In sum, a noticeable improvement in sociopragmatic appropriateness in high-imposition situations was observed across three groups. This means that all communication modes significantly enhanced learners' sociopragmatic competence and awareness in the context of high imposition.

### 5.2.2 Frequency of request strategies

A corpus of request data ( $N=1,218$ ) gathered from the responses of seven high-imposition situations in the pretest and posttest WDCT was coded and analyzed in terms of request strategies following the framework provided by Trosborg (1995). Specifically, pragmalinguistic

<sup>1</sup> <https://www.iflyrec.com/>

TABLE 1 Descriptive statistics of engagement across three different modes.

Mode	Engagement	Measure	M	SD	Min.	Max.
Text chat	Cognitive	LREs	0.014	0.029	0.000	0.105
		Responsiveness	0.114	0.091	0.000	0.286
	Emotional	Positive	4.331	0.656	3.000	5.000
		Negative	1.206	0.343	1.000	2.000
Audio chat	Cognitive	LREs	0.084	0.185	0.000	0.769
		Responsiveness	0.142	0.217	0.000	0.923
	Emotional	Positive	4.181	0.730	2.600	5.000
		Negative	1.562	0.648	1.000	3.400
FTF chat	Cognitive	LREs	0.064	0.032	0.013	0.123
		Responsiveness	0.083	0.032	0.012	0.141
	Emotional	Positive	4.019	0.856	2.000	5.000
		Negative	1.375	0.556	1.000	3.000

TABLE 2 Kruskal–Wallis test for the learner engagement across three modes.

Engagement	Median (P25, P75)			H	df	p
	Text chat	Audio chat	FTF			
LREs	0.000 (0.000, 0.018)	0.044 (0.016, 0.063)	0.066 (0.037, 0.088)	17.832	2	<0.001
Responsiveness	0.098 (0.040, 0.204)	0.073 (0.057, 0.139)	0.088 (0.060, 0.098)	0.295	2	0.863
Positive emotion	4.40 (3.80, 5.00)	4.20 (3.40, 5.00)	4.00 (3.40, 5.00)	1.894	2	0.388
Negative emotion	1.00 (1.00, 1.40)	1.40 (1.00, 2.00)	1.00 (1.00, 1.75)	6.081	2	0.048*

\*p<0.05.

knowledge was measured by the frequency of indirect strategies in upward requests (Ajabshir, 2019).

The frequency of strategies used in the responses of the posttest was compared with that in the pretest data to examine students' development in their use of request strategies in the high-imposition context. Table 7 shows that all three groups favored the H-indirect category (66.67% for text chat, 71.43% for audio chat, and 60.68% for FTF chat) followed by the S-indirect category (25.67, 20.41, and 32.91% respectively), and conventionally direct strategies (6.76, 7.76, and 6.41% respectively) before the instructional treatment. Hints were the least frequently used strategies to express their request in both the pretest (0.90, 0.41, and 0%) and the posttest (0, 0.43, and 0%). However, a shift in the use of strategies took place after the intervention. It can be seen that all three groups used fewer direct strategies (6.76% vs. 3.21, 7.76% vs. 1.70, and 6.41% vs. 3.18%), but utilized more indirect strategies (92.34% vs. 96.73, 91.84% vs. 97.87, and 93.59% vs. 86.81%).

As regards the measure of the pragmalinguistic competence, the result of a non-parametric Kruskal–Wallis test indicated that there was no significant difference ( $H = 3.187$ ,  $df = 2$ ,  $p = 0.203$ ) in the use of indirect requesting strategies in the posttest among text-chat, audio-chat and FTF groups. This suggests that no substantial change was observed in the overall pragmalinguistic competence across different groups before and after the intervention. However, there was a change in the preference for using their indirect strategies.

Based on the Wilcoxon test results in Table 8, it can be seen that the number of S-indirect strategies significantly decreased in all three groups ( $Z = -3.695$ ,  $p < 0.001$  for text chat,  $Z = -1.988$ ,  $p = 0.047$  for

audio chat, and  $Z = -3.251$ ,  $p = 0.001$  for FTF chat), while a significant increase was observed in the frequency of H-indirect strategies in all three groups ( $Z = -4.078$ ,  $p < 0.001$  for text chat,  $Z = -2.020$ ,  $p = 0.043$  for audio chat, and  $Z = -3.031$ ,  $p = 0.002$  for FTF chat). The results demonstrated that students who underwent the treatment displayed a greater tendency to utilize more polite request strategies in situations involving high imposition. This was evident in their approach to making requests from the hearer's perspective to lessen the imposition. The shift also revealed that their pragmatic awareness had been enhanced, as they showed a better understanding and sensitivity toward the appropriate use of language in high-imposition situations by generating requests with a lower level of directness. Additionally, there was an observed increase in the variety of sentence patterns used for head act strategies after the treatment. Alongside the commonly used formulaic pattern "Could/Can you...", students began to utilize alternative sentence patterns "I wonder if you...", "I would very appreciate if you..." etc.

In general, these findings suggest that task-based interaction in CMC-oriented settings and FTF settings increased the tendency to generate more polite requests to higher-status individuals.

### 5.3 The relationship between learner engagement and request learning

To address the third research question that investigates the relationship between learner engagement and the improvement in request learning, a correlation analysis was conducted. Building on the

TABLE 3 Post hoc pairwise comparisons of LREs and negative emotions.

Indicator	Test statistic	Std. error	Std. test statistic	$p$	Direction
LREs	-20.437	4.900	-4.171	<0.001	FC>TC*
	-13.031	4.900	-2.659	0.008	AC>TC*
	-7.406	4.900	-1.511	0.131	AC>FC
Negative emotion	-6.547	6.264	-1.045	0.296	TC<FC
	-15.391	6.264	-2.457	0.014	TC<AC*
	8.844	6.264	1.412	0.158	FC<AC

TC, text chat; VC, video chat; FC, FTF chat. The direction of the score asymmetric across modes is indicated by > and <. \* $p < 0.017$  (Bonferroni correction).

TABLE 4 Descriptive statistics for the pretest and posttest scores of each group.

Group		Min.	Max.	M	SD	Skewness	Kurtosis
Text-chat	Pretest	16.00	31.00	23.52	0.678	-0.126	0.061
	Posttest	18.00	33.00	25.93	0.747	-0.380	-0.818
Audio-chat	Pretest	14.00	29.00	22.26	0.560	-0.468	0.571
	Posttest	21.00	33.00	26.06	0.571	0.375	-0.346
FTF chat	Pretest	16.00	28.00	21.93	0.681	0.133	-0.774
	Posttest	17.00	33.00	24.89	0.821	-0.055	-0.431

research by Carver et al. (2021), this study defined learning outcomes as significant learning development (i.e., the gain appropriateness scores).

Given that the data did not meet the assumption of linearity and normality, Spearman correlation was utilized to assess the relationship between all indicators of engagement (i.e., predictors) and the gains in appropriateness scores from pre-to posttest (i.e., outcome variable). Figure 2 presents the descriptive statistics of the gains in sociolinguistic appropriateness from pre-to posttest. Overall, the mean posttest scores were higher than those of the pretest, with audio-chat group showing the greatest improvement ( $M=3.81$ ), followed by the FTF group ( $M=2.41$ ), and Text-chat group ( $M=2.96$ ). The measures of engagement (i.e., the number of LREs, responsiveness, and emotion scores), along with the gains in sociopragmatics appropriateness scores, were used as variable in the Spearman correlation to determine which predictor was associated with the improvement.

As revealed in Table 9, three predictors (i.e., responsiveness instances, positive emotion scores, and negative emotion scores) in the Audio-chat group were significantly correlated with the outcome variable (the gain scores). Among them, the responsiveness of social engagement was positively correlated with the learning outcome ( $\rho=0.398$ ,  $p=0.027$ ). In terms of emotional engagement, positive emotion was positively associated with the learning outcome ( $\rho=0.508$ ,  $p=0.004$ ), while negative emotion showed a negative association with the learning outcome ( $\rho=-0.466$ ,  $p=0.008$ ). This finding corroborates the notion that emotional engagement can influence the learning outcome.

These three predictors were included in the regression model using the Enter method. Table 10 indicates that the model was statistically significant ( $F=3.641$ ,  $p=0.025$ ), and accounted for 20.9% of the variance in the gains of sociopragmatic appropriateness ( $R^2=0.288$ , adjusted  $R^2=0.209$ ). However, within the regression model, responsiveness ( $\beta=0.242$ ,  $p=0.162$ ), positive emotion score ( $\beta=0.399$ ,  $p=0.152$ ), and negative emotion score ( $\beta=-0.038$ ,  $p=0.892$ ) were not statistically significant. This implies that in the

audio-only communication, although social engagement and emotional engagement may reflect an influence on request learning outcomes, they do not significantly predict these learning outcomes.

## 6 Discussion

The primary goal of the present study was to investigate learners' engagement (cognitive, social, and emotional aspects) during the collaborative writing in text chats, audio chats, and FTF chats, as well as their learning outcomes of request. The study further examined the impact of learner engagement on these learning outcomes.

Regarding learner engagement (RQ1), this study found that the learners in the audio-chat condition and FTF interactions were significantly more cognitively engaged during the interaction than those in the text-chat group. This finding partially supports previous research indicating an advantage of FTF communication over text chat on cognitively engaging learners (e.g., Baralt, 2014; Baralt et al., 2016; Carver et al., 2021). For example, Baralt (2014) found more LREs occurred in FTF than in text-chat communication, suggesting that learners are more accustomed to interaction in face-to-face conditions but may not view the online text-chat context as a natural place to focus on language forms (see Carver et al., 2021). Ziegler and Phung's (2019) proposed that the lack of visual support in the audio chat may encourage learners to rely more heavily on verbal information during interaction, potentially increasing cognitive engagement. This reliance on a single modality could lead to a greater focus on the language used. The interactive characteristics of audio chat expose learners to spoken language and continuous communication, which may draw their attention to linguistic forms and increase the likelihood of noticing and internalizing language structures. In this study, this heightened noticing can lead to an increased occurrence of LREs as learners grapple with the language input in these interactive settings. In contrast, text-chat communication may not provide the same level of



linguistic cues and immediate interaction, potentially reducing the frequency of LREs and cognitive engagement. Moreover, the absence of spoken language nuances, such as intonation and tone, in written messages can limit learners' noticing of language features and their ability to cognitively engage with the language. Therefore, audio chat and FTF communication may better facilitate continuous cognitive attention to language resources.

Regarding social engagement, although the difference was not statistically significant, both CMC groups (i.e., text-chat and audio-chat) showed higher levels of responsiveness compared to the face-to-face group. This finding is opposite to Baralt et al.'s (2016) findings that learners were more cognitively, socially, and emotionally engaged in FTF interaction. It seems possible that this contradictory result is due to the common features shared by the two CMC modes of communication. Neither of them enables participants to see the other's face, gesture, or other body language; instead, they can only communicate with each other through textual modality in the text-chat condition or auditory information in the audio-only chat. Compared to FTF communication, the lack of other non-verbal cues (e.g., gestures, facial expression, and body language), which served as an alternative affirmative backchannel – a main component of responsiveness – may encourage pairs in CMC conditions to produce more written or verbal responses (e.g., "all right," "ok," "yes" etc.) during the interaction. Perhaps the potential effects of different modalities on engagement need to be further explored in future research.

Turning to emotional engagement, it was found that pairs across all groups reported high levels of positive emotion. Most learners stated in the interviews that they felt interested and happy with the task. However, there was a significant difference in the self-reported negative emotions, with the audio-chat group reporting the highest score and the text-chat group reporting the lowest score. Possible reasons for the advantage of the text-chat condition in the current

study are proposed. Firstly, synchronous text-based chatting provides learners with more planning and processing time to organize their ideas before sending the messages (see Ziegler, 2016a, for the review), which creates a less urgent and stressful environment (Ziegler and Phung, 2019). The second possible explanation is that all the participants are familiar with the WeChat social network setting, as it is the most frequently used social instant messaging tool in their daily lives. Thus, they are accustomed to and could adapt to this mode of communication. However, based on interview data, it was found that some of them encountered anxiety and a sense of urgency during the interaction process. This was due to their unfamiliarity with basic computer operation skills, the functions of Tencent conferencing software, and their lack of proficiency in typing within the time-limited situation (see Excerpt 1).

**Excerpt 1.** Lack of proficiency in typing.

"I still feel like my typing is not fast enough so that many ideas have occurred in my mind, but I can express them properly."  
(Student 7 from Audio-chat group)

This study also examined the impact of communication mode on request learning (RQ2), specifically focusing on sociopragmatic appropriateness and pragmalinguistic forms (i.e., request strategies). The findings revealed that regardless of the communication mode used, all learners demonstrated notable enhancements in sociopragmatic appropriateness, and a greater diversity of indirect strategies when making high-imposition requests. However, the overall number of indirect strategies used in the WDCT posttest was not significantly different. The findings partially align with the result of Ajabshir's (2019) research, which showed an insignificant difference in two CMC-oriented groups (i.e., synchronous/asynchronous text-based chat), with similar frequencies of indirect speech acts in the posttest. Although no significant difference was found for overall appropriateness and indirectness of requests across three communication modes, the pre-post WDCT comparison revealed a marked improvement in strategy choice for all groups, tending to generate more polite requests in high-imposition situations. The findings can be interpreted with the learners' responses in the post-task interview. Some learners' responses revealed that regardless of the communication contexts, they were more inclined to attribute their improvement in request expressions to the metapragmatic instruction about the rules and forms of making requests (see Excerpt 2). In other words, learners can effectively mobilize the related knowledge (i.e., request strategies and modifiers) in the process of writing the drama script. It manifests a great need and facilitative role of metalinguistic instruction in the EFL learner's pragmatics learning.

TABLE 5 ANCOVA results for the posttest scores across three modes.

Source	SS	df	MS	F	p	$\eta^2$
Corrected model	380.841*	3	126.947	12.072	0.000	0.304
Intercept	277.389	1	277.389	26.378	0.000	0.241
Pretest	357.585	1	357.585	34.004	0.000	0.020
Group	17.365	2	8.683	0.826	0.442	0.291
Error	872.814	83	10.516			
Total	58516.000	87				
Corrected total	1253.655	86				

\*R Squared = 0.304 (Adjusted R Squared = 0.279).

TABLE 6 Paired-sample T-test for pre- and -post change in scores.

Group	M	SD	SEM	95% CI		t	df	p
				Lower	Upper			
Text chat	-2.41	2.758	0.512	-3.46	-1.36	-4.713	28	<0.001
Audio chat	-3.81	3.187	0.572	-4.97	-2.63	-6.649	30	<0.001
FTF chat	-2.96	4.441	0.854	-4.72	-1.20	-3.466	26	0.002

TABLE 7 Frequency of request strategies used by each group.

Strategy	Text chat (n = 29)		Audio chat (n = 31)		FTF chat (n = 27)	
	Pretest (%)	Posttest (%)	Pretest (%)	Posttest (%)	Pretest (%)	Posttest (%)
Direct	15 (6.76)	7 (3.21)	19 (7.76)	4 (1.70)	15 (6.41)	7 (3.18)
S-indirect	57 (25.67)	21 (9.63)	50 (20.41)	34 (14.47)	77 (32.91)	36 (16.36)
H-indirect	148 (66.67)	190 (87.10)	175 (71.43)	196 (83.4)	142 (60.68)	177 (80.45)
Hint	2 (0.90)	0 (0)	1 (0.41)	1 (0.43)	0 (0)	0 (0)
Total	222 (100)	218 (100)	245 (100)	235 (100)	234 (100)	220 (100)

TABLE 8 Wilcoxon signed ranks test for pre-and -post change of indirect request strategies.

Strategy	Text chat		Audio chat		FTF chat	
	Z	p	Z	p	Z	p
S-indirect	-3.695 <sup>b</sup>	<0.001	-1.988 <sup>b</sup>	0.047*	-3.251 <sup>b</sup>	0.001**
H-indirect	-4.078 <sup>c</sup>	<0.001	-2.020 <sup>c</sup>	0.043*	-3.031 <sup>c</sup>	0.002**
Hints	-1.414 <sup>b</sup>	0.157	-1.000 <sup>c</sup>	0.317	0.000 <sup>d</sup>	1.000

<sup>b</sup>Based on positive ranks; <sup>c</sup>Based on negative ranks; <sup>d</sup>The sum of negative ranks equals the sum of positive ranks. \* $p < 0.05$ ; \*\* $p < 0.01$ .

**Excerpt 2.** The effect of metapragmatic instruction.

“It made me gain a lot. The instruction class was very helpful, allowing me to **know more request expressions beyond ‘Could you ... please’**, and making my written expression less sparse than before.” (Student 4 from the text-chat group)

Additionally, the current study investigated the potential influence of learner engagement on the learning outcomes of request (focusing on significant sociopragmatic improvement) in diverse communication modes by examining their relationship (RQ3). It found that in the context of audio-based communication, there existed a significant relationship between social engagement and emotional engagement with learning outcomes, but this was insufficient to demonstrate predictive capabilities. The association between social engagement and learning is in line with previous studies that reported a significant impact of semantically engaged talk – an indicator of social engagement – on improvement in writing (Dao et al., 2021; Phan and Dao, 2023). Greater social engagement in tasks may lead to more learning opportunities occurring during the task interaction.

The finding regarding a link between emotional, but not cognitive engagement, and learning is similar to that of Carver et al. (2021). Drawing upon Wigglesworth and Storch's (2012) research, which yielded similar results, they argued that LREs may not provide a whole picture of cognitive engagement, since some learners may have been “silently engaged” in the task across modes (cited in Carver et al., 2021), particularly in the text-chat mode. Upon closer examination of the chat logs in text-chat interactions, it was found that pairs primarily presented their writing drafts directly but rarely displayed the process of discussion during the interaction. Additionally, the message exchange via text chat was not as coherent as in the other two modes, with noticeable time lags between turns of conversation. The findings can also be interpreted with the responses from the text-chat group. For example, one learner reported, “*I probably have fewer chat logs with my partner, because we are modifying our story directly on the online shared document without much mutual communication,*” indicating that the pairs were ‘slightly engaged’ in the collaborative

writing. Moreover, other aspects of cognitive processes (e.g., memory, reasoning, etc.) were not captured in this study. Future studies should consider employing more comprehensive measurements to capture the potentially hidden cognitive aspects of the interaction.

## 7 Conclusion

The current study investigated the effects of communication mode on Chinese EFL learners' engagement during the collaborative task interaction, as well as their learning of request. It also explored the potential relationship between learner engagement and learning outcomes. The findings revealed that audio-based and FTF interaction led to better cognitive engagement, while text chat appeared to mitigate learners' negative feelings by providing more processing time. All communication modes significantly enhanced learners' sociopragmatic competence and awareness in high-imposition contexts, leading to a greater tendency to produce more polite requests in upward context. Only audio-chat displayed a significant association between social engagement and emotional engagement with their subsequent gains in sociopragmatic appropriateness. However, the measures of learner engagement were not predictive of sociopragmatic improvement in the current study.

Inevitably, the current study has some limitations. Firstly, the implementation of CMC for foreign language learning has not been normalized in a majority of middle schools in China. Furthermore, a preliminary technology survey on learners' computer skills was not conducted. Such an individual factor might have influenced the learners' engagement to some extent. Future investigations could consider the mediated effects of individual factors (e.g., aptitude, motivation, computer skills). Next, there were few indicators for engagement measures applied in the analysis, which resulted in difficulty grasping the intrinsic nature of each dimension of engagement during the task. As stated by Hiver et al. (2021), the construct of engagement needs to be reflected with greater operational transparency in future empirical studies. Thirdly, inadequate time was allocated for metapragmatic instruction and collaborative tasks, which

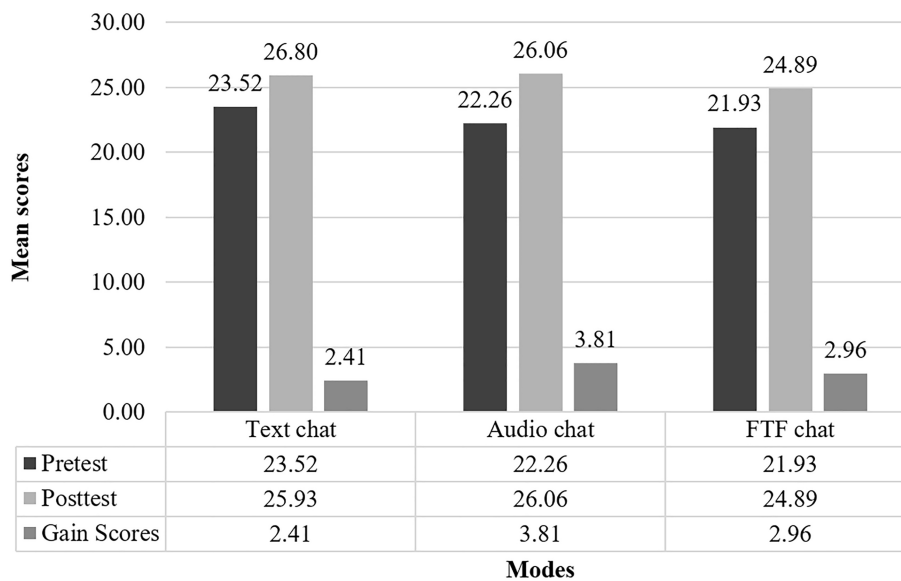


FIGURE 2 The mean scores of pre-posttest WDCT and gain scores.

TABLE 9 Spearman correlation between measures of engagement and gain scores.

Engagement	Measure	Text-chat		Audio-chat		FTF	
		$\rho$	Sig.	$\rho$	Sig.	$\rho$	Sig.
Cognitive	LREs	0.048	0.806	0.317	0.082	-0.165	0.409
Social	Responsiveness	-0.021	0.915	0.398*	0.027	0.171	0.395
Emotional	Positive emotion	-0.106	0.585	0.508**	0.004	0.054	0.790
	Negative emotion	0.033	0.863	-0.466**	0.008	-0.135	0.503

\*\*Correlation is significant at the 0.01 level (2-tailed). \*Correlation is significant at the 0.05 level (2-tailed).

TABLE 10 Multiple regression model for measures of engagement and gain scores in audio-chat group.

Predictor	B	$\beta$	t	p	F	R <sup>2</sup>	Adjusted R <sup>2</sup>
Responsiveness	3.568	0.242	1.437	0.162	3.641	0.288	0.209
Positive emotion	1.724	0.399	1.473	0.152			
Negative emotion	-0.185	-0.038	-0.138	0.892			

Coefficient significance of predictors: responsiveness, positive emotion, negative emotion; dependent variable: gains.

may have hindered participants from demonstrating their full potential. Additionally, future studies exploring the potential impact of learner engagement on learning outcomes should consider employing a larger sample size.

China Normal University. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

### Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

### Author contributions

ZS: Writing – original draft, Writing – review & editing. CC: Writing – original draft, Writing – review & editing.

### Ethics statement

The studies involving human participants were reviewed and approved by Ethics Committee of School of Foreign Studies, South

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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## Supplementary material

The Supplementary material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/feduc.2024.1454387/full#supplementary-material>

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