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Teacher immediacy as an external regulator in digital game-based language learning: A mixed-method study of intrinsic motivation, classroom anxiety, and willingness to communicate

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Abstract

From the perspective of the interactionist theory, this study identified that individual differences may hinder the meaningful communication for language acquisition among English as a foreign language (EFL) learners in digital game-based language learning (DGBLL), and needing an external regulator that helps students in intrinsic motivation, classroom anxiety, and willingness to communicate (WTC). Further reviews identified that teacher immediacy could function as the external regulator for helping mitigating the negative influences of these individual differences, leading to this experimental design. With 43 Chinese high school EFL students and a mixed-method approach, this study collected both quantitative and qualitative data regarding the effectiveness of teacher immediacy in DGBLL. Findings reveal that teacher immediacy significantly enhances students' intrinsic motivation, reduces classroom anxiety, and boosts willingness to communicate. The study also discussed the importance of teacher immediacy in balancing gaming and educational behaviors, and the potential demand of teacher immediacy for all EFL students with various individual differences, suggesting that teacher immediacy may be crucial for maximizing the benefits of DGBLL regardless of the individual differences, because most of the EFL students would need teacher's encouragements and instructions for meaningful communications.

Keywords: teacher immediacy, intrinsic motivation, classroom anxiety, willingness to communicate, digital game-based language learning



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Introduction

From an interactionist theory perspective (Lightbown & Spada, 2021), second or foreign languages are acquired through meaningful communication and interaction with others. Ample empirical evidence from cognitive and usage-based research (e.g., Ellis & Wulff, 2020) supports the importance of psychological processing based on language use in second language acquisition. Complementing this perspective, self-determination theory (Ryan & Deci, 2020) explains how different types of motivation shape learners' engagement in such communicative opportunities. Specific to English as a foreign language (EFL) education, studies have also argued for the significance of motivated learner-learner interaction in classrooms (Bowles & Adams, 2015) because of the intense frequency of communications among learners of the target language (Adams et al., 2011). To encourage learner-learner interaction in the target language, digital game-based language learning (DGBLL) has been found to be an effective approach, as it creates an interactive and communicative learning environment that sustains meaningful communication for EFL acquisition (e.g., Zhou, 2024; Derakhshan et al., 2024).

Whereas interactionist theory emphasizes the importance of meaningful interaction opportunities, self-determination theory explains whether and how learners are motivated to take up these opportunities. Studies have found that DGBLL's benefits are subject to individual differences such as intrinsic motivation, classroom anxiety, and willingness to communicate (WTC) (Lightbown & Spada, 2021). If the students in DGBLL are not intrinsically motivated in an immersive learning environment where meaningful communication in the target language occur, they are likely to detach from the language learning activities (Liu et al., 2024), rendering carefully designed DGBLL activities ineffective to language acquisition. Therefore, maintaining meaningful communication in the target language is a key indicator of DGBLL success. Drawing from the self-determination theory (Ryan & Deci, 2020) and teacher immediacy (Lightbown & Spada, 2021), this study suggests that teacher immediacy may function as an external regulator to maintain such communication for amotivated students with little motivation and self-regulation. As seminal work have suggested (Lightbown & Spada, 2021), "teachers can make a positive contribution to students' motivation to learn if classrooms are places that students enjoy coming to because the content is interesting" (p. 91). Further, studies have also found linkages between teacher immediacy and students' active use of English in EFL education for it reduces anxiety and increases motivation, leading to enhanced engagement (e.g., Zhi & Wang, 2024). Therefore, this study's contribution lies in its testified mechanism. Instead of solely relying on the DGBLL learning environment for EFL acquisition, it conceptualizes teacher immediacy as an external regulator that supports meaningful and communicative participation among amotivated EFL learners in a DGBLL environment, adding an additional layer of human agency to the existing DGBLL studies.

To investigate these possibilities, an empirical examination of the effectiveness of teacher immediacy in regulating students' behavior in DGBLL is warranted. Theoretically, the study advances nuanced understanding of the effectiveness of DGBLL for students with low motivation, low WTC and/or high classroom anxiety by examining the interplay between DGBLL pedagogy and learner's individual differences in EFL classrooms, identifying the necessities of a differentiation view in DGBLL's influence with students of different individualities. Practically, it provides guidance to DGBLL pedagogy by adding the teacher immediacy factor into the mix that addresses the participation and engagement issues among EFL learners under the interactionist theory. Furthermore, the correlation between individual learners' characteristics and L2 learning outcomes is a fluctuate condition due to differences in "opportunities to engage in communication with peers, colleagues, and even teachers" (Lightbown & Spada, 2021; p. 83), adding this teacher immediacy factor into DGBLL would mitigate students' limitations in communications in the target language through supportive and encouraging behaviors, thus optimizing the effectiveness of DGBLL activities.

Literature Review

Individual differences in DGBLL classroom engagement

Intrinsic motivation

Individual differences such as personality and motivation have predictive effects on the success or failure of foreign language acquisition. In the interactionist theory which stresses the significance of meaningful learner to learner communication in EFL education (Lightbown & Spada, 2021), such differences could determine one's engagement in learning activities. Specific to communicatively designed DGBLL activities, if students are amotivated in their abilities for making progress in their EFL education, they are unlikely to deeply engage in the DGBLL activities despite of the inherent interactive nature of the learning environment.

Dörnyei's study (2001) categorizes learning motivation into three phases: selection, execution, and retrospection. In Dörnyei's (2001) framework, the initial 'choice' phase is often driven by extrinsic motives (e.g., studying English for overseas education), yet such motives do not guarantee sustained classroom engagement. When learners' limited proficiency clashes with high expectations or assessment pressure, their in-class participation may decrease. Drawing from the self-determination theory (Ryan & Deci, 2020), a possible solution to the execution motivation issue is to enhance intrinsic motivation for learning, as it cultivates students' perseverance in the face of challenges (Guo et al., 2023; Fathi et al., 2024). Intrinsic motivation means the inherent satisfaction and enjoyment derived from doing something one loves (Ryan & Deci, 2020). This

indicates that such motivation originates internally rather than being influenced by external outcomes, thereby complicating fostering the development through teacher immediacy, particularly in digital learning contexts (Hu & Shen, 2024). However, researchers of self-determination theory have demonstrated that the motivation to learn undergoes an internalization process whereby "external social rewards build initial interest and accomplished performance until natural consequences take over" (Cameron & Pierce, 2002, p. 61). This allows an external regulator, such as teacher immediacy, to become favorable "social consequences" (Cameron & Pierce, 2002, p. 61) that encourage students to actively participate in the language acquisition.

Intrinsic motivation is essential for student engagement in EFL interactions and communications, hence supporting the interactionist approach to language acquisition. Numerous studies indicate that intrinsic motivation results in (1) enhanced engagement, creativity, and persistence in language acquisition (Lin & Wang, 2021), (2) increased diligence among students when confronted with challenges in EFL education (Fathi et al., 2024), (3) the cultivation of self-regulation skills that facilitate the establishment of personal objectives and the formulation of strategies to attain them (Qiao et al., 2022), and (4) ultimately improvements WTC and English proficiency, which in turn fosters intrinsic motivation as favorable social consequences (Namaziandost & Rezai, 2024).

For the importance of intrinsic motivation in EFL instruction, researchers have been examining the impacts of particular DGBLL characteristics to enhance this form of motivation. The research conducted by Chen and Huang (2024) indicated that incorporating a reward and competitive element in DGBLL activities can substantially enhance students' intrinsic motivation. The incentives and rivalry, typically arising from the interactive characteristics of games (Chen et al., 2020), promote inquiry and curiosity, which are fundamental to intrinsic motivation (Ryan & Deci, 2020). Moreover, DGBLL has been shown to enhance students' sense of autonomy, hence fostering engagement and facilitating learning improvements (Zhou, 2024). However, these benefits presuppose that learners are willing to use the target language during gameplay. Amotivated students may remain reluctant to participate in English, regardless of the attractiveness of DGBLL (Zhang et al., 2023), which highlights the potential need for teacher immediacy as an external regulator.

Classroom anxiety

Classroom anxiety is another key individual difference that undermines student engagement (Melchor-Couto, 2017). Anxiety stemming from fear of errors, peer judgment, or perceived inadequacy reduces learners' willingness to take part in class activities and collaborative tasks, including interactive DGBLL activities (Tsang & Dewaele, 2024; Zhang et al., 2023). As a result, anxious students obtain less exposure to the target language

and fewer opportunities to practise, which constrains their academic development (Hamada & Takaki, 2021).

Furthermore, anxiety negatively impacts students' WTC, restricting them to exchange meaning in the target language. Anxious students frequently exhibit an unwillingness to engage in conversations, despite their desire to participate in DGBLL activities (Kruk, 2022). This resistance limits their opportunity to practice speaking and listening, possibly resulting in less effective rote learning of the English language (Jin et al., 2021; Ding, 2024).

Moreover, classroom anxiety can disrupt cognitive processing, making it harder for learners to concentrate, process input, and retrieve knowledge (Jin et al., 2021), thereby impeding the flow of meaningful communication in DGBLL (Yang et al., 2020). Over time, high anxiety may result negative attitudes toward English language and learning, further discouraging students from engaging in target-language communication for learning purposes (Lou & Noels, 2020).

Thus, individual differences in classroom anxiety among EFL students may lead to markedly different levels of engagement in DGBLL-mediated communication. Amotivated students often report higher anxiety (York et al., 2021) and are therefore particularly unlikely to benefit fully from DGBLL. For these learners, teacher immediacy as an external regulator may be essential to encourage and support their participation.

WTC

WTC is the probability of a student participating in communication when presented with the opportunity (MacIntyre et al., 1998). And EFL research demonstrates that developing WTC is crucial for successful language learning, as students who are inclined to communicate in the target language have more practice opportunities to use and improve their knowledge of the language (Lee & Lee, 2019).

Individual differences of WTC among EFL students also result in disparities in target-language interactions. Balouchi and Samad (2021) contended that WTC is tightly connected to real communicative activities, indicating that diminished WTC results in decreased language utilization and delayed language acquisition. Moreover, students who are reluctant to engage in communication forfeit vital speaking practice, which is necessary for cultivating fluency and confidence (Zhao et al., 2024).

Low levels of WTC may be prevalent among EFL students exhibiting diverse levels of motivation and anxiety in many educational cultures. Cheng and Xu (2022) conducted a large-scale study in China revealing that the deficiency of WTC is widespread among Chinese students across all levels of English competence. The same is true in South Korea (Lee & Lee, 2019), Poland (Kruk, 2015), and other cultures with the instrumentalism view of education (Sun et al., 2025), because these educational cultures prioritize accuracy over

fluency (Fang et al., 2021) and rote memorization of grammar and vocabulary, thus overlooking speaking and listening (Tsang, 2023).

Therefore, examining the efficacy of teacher immediacy as an external regulator to WTC in DGBLL is essential not only for students with unfavorable individual differences, such as low intrinsic motivation and elevated classroom anxiety, but also for most of the EFL students who have inadequate WTC to communicate in the target language.

Teacher immediacy to address these individual differences for classroom engagements

Compared with traditional classroom activities, DGBLL particularly demands learners' attention and interaction in the digital environment (Guan et al., 2025). Fast-paced gameplay can encourage students to focus on winning the game rather than on using the target language, and learners who struggle linguistically may quickly revert to their first language to keep up with the game flow (Hwang & Zhang, 2024). In this sense, teacher immediacy not only provides real-time encouragement and emotional support in the EFL learning context, but also helps students sustain English use, thus helping to align their gaming behaviors with pedagogical goals. Teacher immediacy is defined as the verbal and non-verbal behaviors that shortens physical and psychological distances between teachers and students (Mehrabian, 1971), it has been found to be critical in promoting learners' intrinsic motivation, reducing classroom anxiety and fostering WTC for better classroom engagements.

Studies have found that teacher immediacy behaviors such as expressing enthusiasm, providing positive feedback, and showing personal interest in students, help create a connection that encourages students to engage in learning process and overcome difficulties through fostered intrinsic motivation (e.g., Li et al., 2024). Specifically, studies have argued that teacher immediacy behaviors stimulate positive attitudes of students towards the language learning (Alhujaylan, 2024) and develop a sense of belonging and connection within language classrooms (Brandl, 2012), thereby intrinsic motivation could be developed to allow meaningful communications in the target language to happen.

Past studies have also discovered the effects of teacher immediacy in reducing classroom anxiety. Although DGBLL creates an immersive environment that would help students to make meaning communications with others for it helps the learning being more fluency-focused (Hwang & Zhang, 2024), for students who are not proficient enough to fluently play the games, teacher immediacy could encourage and help them in making the communications, thus further reducing their classroom anxiety (Nami, 2022). In fact, the effect of teacher immediacy in reducing classroom anxiety may be especially important for DGBLL activities because the dynamic nature of games requires sustained interaction

(Reinders & Wattana, 2015), which is much more demanding in terms of student attention and participation, creating stress from the experience.

Furthermore, teacher immediacy encourages students to participate more actively in discussions and collaborative tasks in DGBLL (Teo et al., 2022). With teacher immediacy behaviors such as consultation, encouragement, and appraisal, students are more likely to take risks and engage in communicative practices (Wu et al., 2023). Studies have also shown that, when teachers demonstrate care and support to students, students' level of engagement and willingness to communicate can be significantly enhanced (Derakhshan et al., 2024), further indicating the potential effectiveness of teacher immediacy in DGBLL under the interactionist theory.

In this study, we focus on the outcome of intrinsic motivation, classroom anxiety, and WTC in DGBLL with teacher immediacy as the mechanism. These constructs are closely aligned with interactionist perspectives and self-determination theory. From an interactionist viewpoint, meaningful second language development depends on learners' active, willing participation in communicative interaction. From a self-determination perspective, intrinsic motivation is not only more likely to sustain effort and foster deep learning than external contingencies (Ryan & Deci, 2020), but also a key outcome in DGBLL studies (e.g., Qiao et al., 2022; Chen & Huang, 2024). Classroom anxiety and WTC, in turn, directly capture whether learners can and will take part in such interaction. We acknowledge that extrinsic motivation is also relevant to DGBLL but consider it falling beyond the scope of this study.

Therefore, based on the previous review of literature, propose the following research questions to be answered:

- (1) Would teacher immediacy in DGBLL contribute to improvements in learning motivation, classroom anxiety, and WTC?
- (2) How would teacher immediacy in DGBLL impact students for these outcomes?

Method

Sampling and participants

Ethical approval was obtained from the first author's university ethics committee. For sampling, the authors distributed participant recruiting messages at three high schools in a eastern Chinese city. Altogether 43 first-and-second-year students with sub-optimal performances in English signed the consent form and participated in the experiment. The participants were then randomly assigned to an experimental group (EG) and a control group (CG), engaging in DGBLL activities. The demographic details of each group are detailed in Table 1. 19 participants (10 in EG and 9 in CG) volunteered in the semi-structured interviews. Table 2 details the demographic information of the participants.

Table 1

The demographic details of participants

	M_{age}	SD_{age}	Gender distribution
EG	16.38	0.740	12 males; 9 females
CG	16.36	0.658	12 males; 10 females
Interviews	16.38	0.637	14 males; 10 females
All	16.37	0.691	24 males; 19 females

Table 2

The schematic illustration of interviewee profiles

Group	Coding	Age	Gender	Year of High School
	I1	16	F	1 st
	I2	17	F	2 nd
	I3	16	F	1 st
	I4	16	M	1 st
	I5	18	M	2 nd
	I6	17	M	2 nd
	I7	16	M	1 st
EG	I8	16	M	2 nd
	I9	16	M	2 nd
	I10	16	M	1 st
	I11	17	F	2 nd
	I12	16	F	1 st
	I13	16	M	1 st
	I14	17	F	2 nd
CG	I15	16	F	1 st
	I16	17	M	2 nd
	I17	17	F	1 st
	I18	16	F	2 nd
	I19	16	M	2 nd

The intervention and experiment

Students in both groups played Werewolves of Miller's Hollow (*the game*, 狼人杀) for 2 hours a week for 8 consecutive weeks. The game is a communication-based deduction game popular among Chinese youngsters. The design of the DGBLL intervention was informed by interactionist theory and flow theory. Interactionist perspectives emphasize that language development is fostered when learners engage in negotiation of meaning and receive interactionally modified input and feedback. Werewolves of Miller's Hollow was selected because it naturally creates an information-gap, problem-solving environment in which learners must exchange information, negotiate roles, and persuade others through sustained oral interaction. At the same time, the game's clear goals, immediate feedback, and immersive narrative align with flow theory, which has frequently been used to explain learner engagement in digital game-based contexts (e.g., Li et al., 2021). As players become absorbed in their roles (e.g., villagers or werewolves), they experience a merging of action and awareness, often losing self-consciousness and altering their sense of time. Moreover, the game is fit for teacher immediacy to exist because teachers could address students' language-related questions (a manifestation of instructional immediacy),

encourage students to speak more in English (a manifestation of relational immediacy) and make the teacher easily approachable when playing together (a manifestation of personal immediacy) (see Zhang & Oetzel, 2006 for the manifestations).

Both of the groups played the game in traditional face-to-face classrooms with all the identities for the round distributed through a WeChat mini program (微信小程序). Because the game contains certain vocabulary that the students may have not learnt at school (e.g., foreseer) both groups were allowed to use digital dictionaries to help them making expression. The only difference between these two groups was that EG had an experienced English teacher to facilitate the game who helped the students with their expressions in the game (e.g., correcting errors and mistakes in speeches), whereas CG only played with other students. The teacher only took attendance of the CG group at the beginning and the end of each gaming session.

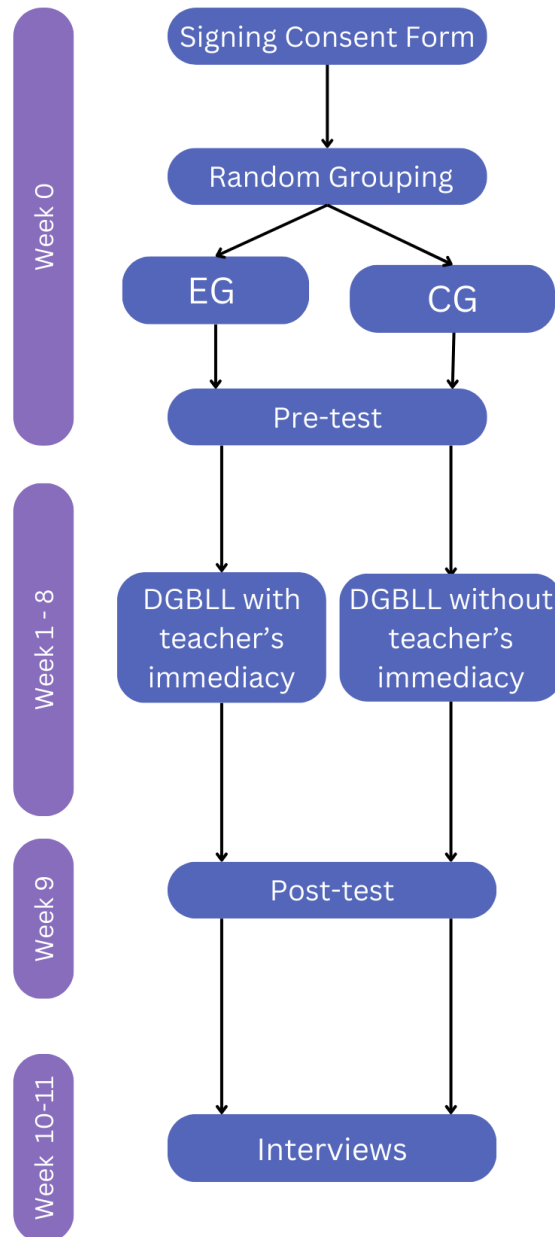
Specifically, the intervention followed a task-based, communicative orientation. Each game session was structured as a series of communicative tasks in which learners needed to use English to obtain and share information, reason others' intentions, and collaboratively identify the "werewolves". For the EG, the teacher's role in the experimental condition was twofold. First, the teacher ensured that English remained the primary medium of communication during gameplay by modeling target language use, gently redirecting learners back to English when necessary, and clarifying game-related language. Second, the teacher enacted immediacy behaviors, such as offering encouragement, showing attentiveness, and providing supportive feedback, to help learners sustain their engagement in English-mediated interaction. For the CG, because they only interacted with other students, the English-mediated interaction was self-sustained without teacher immediacy as the external regulator.

Before the intervention, a pre-test of students' intrinsic motivation, classroom anxiety, and WTC took place. The post-test, happening in week 9 after the intervention, tested the same outcomes for potential improvements. The choice of tests was detailed in section 3.3. In weeks 10-11, semi-structured interviews (each lasted for about 15 minutes) were conducted to collect students' justifications for the changes in these outcomes. Moreover, the teacher was introduced to Zhang and Oetzel's (2006) teacher immediacy scale and to three categories of immediacy behaviors relevant to the DGBLL context: instructional immediacy, relational immediacy, and personal immediacy. In each session, the teacher was encouraged to exercise these immediacy by giving immediate responses to students' questions, modelling student expressions whenever needed, and offer brief, positive verbal and non-verbal feedback to students' attempts to communicate in English. Because of the spontaneous nature of teacher immediacy exercises, there were no planned behavior for the sessions apart from game playing. The teacher was just another player who can help others to make English expressions to communicate. Therefore, unlike

teacher monitoring and instructional support, teacher immediacy in this study was enacted spontaneously, without pre-planned instructional scripts or supervisory control. Figure 1 illustrates the experimental process.

Figure 1

The experimental process



Data Collection

To measure intrinsic motivation, classroom anxiety, and WTC, we adopted well-validated questionnaires with 5-point Likert scales in pre- and post-tests, as shown in the Appendices. Moreover, we also did semi-structured interviews justifying the changes.

Intrinsic motivation. The intrinsic motivation scale was adopted from Vallerand et al.'s (1989) motivation scale, which was developed to measure intrinsic motivation, extrinsic motivation, and amotivation within the framework of self-determination theory. With 12 items scaling intrinsic motivation, the questionnaire examines the students' intrinsic motivation in education, with all factor loading exceeding 0.60 and Cronbach alphas at 0.69 indicating good validity of the test.

Classroom anxiety. The short-form foreign classroom anxiety scale (Botes et al., 2022) was adopted to quantify students' classroom anxiety in this study. The scale consists of 8 items with larger than 0.61 factor loading for each item and Cronbach's alpha at 0.89, indicating high validity of the test.

Willingness To Communicate. The WTC scale (Peng & Woodrow, 2010) was adopted because it was specifically developed for the Chinese EFL context to exclusively measure WTC within in-class EFL education. The factor loading for each item reached at least 0.58, indicating acceptable validity.

In addition to the above quantitative measurements, a qualitative part of data collection was added to gather student's justifications for their potential improvements. This part is necessary because qualitative findings can provide nuanced interpretations of quantitative data, which improves the validity of quantitative investigations (Leavy, 2022). To understand how teacher immediacy might aid students in these outcomes, a semi-structured interview was designed for the participants. The interview consisted of two parts "DGBLL's contribution to the improvements" and "teacher immediacy's contribution to the improvements", and each interview lasted about 20 minutes. To elicit deepest responses, the interview was conducted in Chinese (the shared mother tongue between the interviewer and interviewees), students' L1 on Tencent Meeting, a popular Chinese online meeting room with built-in AI for transcriptions. The interview protocols are also shown in the Appendices.

Data Analysis

The pre-test Likert scale data were compared between EG and CG to determine potential preexisting differences in the measured outcomes between the two groups. With independent sample t-tests, the study found no significant difference in intrinsic motivation, classroom anxiety, and WTC. Table 3 details the results of the t-tests.

Table 3

The between group comparison of pre-test data

		<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>
Intrinsic motivation	EG	1.6468	0.1665			
	CG	1.6858	0.1310	-0.851	41	0.400
Classroom anxiety	EG	4.4643	0.2097			
	CG	4.4659	0.1599	-0.029	41	0.977
WTC	EG	1.4643	0.2536			
	CG	1.4318	0.2462	0.426	41	0.672

For the qualitative transcriptions collected from semi-structured interviews, the authors went through transcription, Chinese-to-English translation, and theorization, conceptualization, coding, and reporting process (Neuendorf, 2017) with an inductive approach for the content analysis, with the help of NVivo13. The coding book detailing the content analysis is depicted in Figure 2. The inter-coder reliability reached 93% and disputes in coding were resolved after discussion.

Figure 2

The coding book

Themes of the qualitative interview.				
Levels of coding schemes	Major themes	Description	Sample quotes	
Intrinsic motivation	DGBLL	Significance of an engaging environment	Students' perceptions on DGBL experience's influence over intrinsic learning motivation	"Because the game was fun, I became more interested to learning English."
	Teacher immediacy	Significance of teacher immediacy	Students' perceptions on Teacher immediacy in DGBL's influence over intrinsic learning motivation	"The teacher taught us words and corrected our errors for playing the game, which made me realize that English could be fun."
Classroom anxiety	DGBLL	Significance of immersive environment	Students' perceptions on DGBL experience's influence over classroom anxiety	"When I was playing the game, I wasn't so nervous because others wouldn't judge my English so much."
	Teacher immediacy	Significance of teacher immediacy	Students' perceptions on Teacher immediacy in DGBL's influence over classroom anxiety	"The teacher helped us to express ourselves, which made me less afraid."
WTC	DGBLL	Significance of an engaging environment	Students' perceptions on DGBL experience's influence over WTC	"I wanted to play the game, so I talked more."
	Teacher immediacy	Significance of teacher immediacy	Students' perceptions on Teacher immediacy in DGBL's influence over WTC	"I could ask the teacher how to say ... in English, so it became easier for me."
English proficiency	DGBLL	Significance of an engaging environment	Students' perceptions on DGBL experience's influence over English proficiency	"I learnt more vocabulary and grammar."
	Teacher immediacy	Significance of teacher immediacy	Students' perceptions on Teacher immediacy in DGBL's influence over English proficiency	"The teacher taught us correct use of English in the game. So I learnt high quality expressions."

Findings

Within-group improvements in intrinsic motivation, WTC, and classroom anxiety in the experimental group

First, the quantitative data indicated the EG group, which experienced DGBLL with teacher's immediacy involved, showed significant within-group improvements in the measured outcomes from pre- to post-test, suggesting a possible role of teacher immediacy in DGBLL. The within-group comparison of pre-to-post-test data in EG is detailed in Table 4. The effect size (Cohen's *d*) of this intervention for the four outcomes were at 0.28, 0.32,

and 0.31 respectively, indicating small pre-post effect sizes in the experimental group for intrinsic motivation, classroom anxiety, and WTC. While small, these effects are noteworthy given the relatively short intervention duration and the participants' initial low motivation and high anxiety. Nevertheless, the found small effects suggest that the mechanism of teacher immediacy should be interpreted as preliminary rather than conclusive evidence for promoting learning results in DGBLL. In this study, we decided not to do a between-group comparison of post-test data between EG and CG, due to the fact that CG, without teacher immediacy and supervision, had quickly given up on using English for the game, making the two groups incomparable. This is further explained in section 4.4.

Table 4

The within-group comparison of EG's pre-to-post-test data for intrinsic motivation, classroom anxiety, and WTC

		<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>
Intrinsic motivation	Pre-test	1.6468	0.1665			
	Post-test	2.5794	0.1656	-15.489	20	0.000
Classroom anxiety	Pre-test	4.4643	0.2097			
	Post-test	3.1190	0.2034	19.211	20	0.000
WTC	Pre-test	1.4643	0.2536			
	Post-test	2.2500	0.1937	-11.649	20	0.000

Theme 1: The significance of an immersive and engaging English learning environment

Next, the qualitative data provided students' explanations of the significant changes in the four measured learning outcomes. The first theme identified among students ($n = 15$) was the immersive English environment that DGBLL provides. They argued that the immersive and engaging learning environment not only provided the opportunities but also the motivation to use oral English with other human agents. These opportunities, in turn, encouraged active participation in English-mediated communication, and enhanced their confidence in English expressions and their performance in English tests.

I1: In the last few weeks, the game provided us with two hours of opportunities to practice oral English, which was something we never got to do at school.

I9: As requested, I made full [English] sentences to play the game, which was something we hardly got to do at school. Besides, I was afraid to express my meanings in English at school because others were listening, and they would judge me. So I reckon that the game provided a safer place for me to practice my grammar and vocabulary, so my grades improved on the tests.

From these excerpts, it is identifiable that the immersive and engaging learning environment created an active and emotionally safe environment in which students have more individual opportunities to practice English with each other. These student behaviors, in turn, motivated themselves to use and learn the English language. Some ($n = 4$) even suggested that this motivation development reached beyond the informal learning context.

I14: I often felt bored in English classes at school. But this game was not boring at all. So I became a bit more tolerant of my school's English classes.

Therefore, for the EG students, the immersive and engaging digital learning context developed by digital technology not only promoted English-medium communication opportunities, but also positively shaped students' mindsets of English learning, thus having the potential to sustain English learning motivation in the long run across both formal and informal learning contexts.

Theme 2: The significance of teacher immediacy

However, the abovementioned benefits of an immersive and engaging environment created by DGBLL could easily fail to materialize without the mediation of teacher immediacy. The researchers observed that CG students started to use Chinese, instead of English, to play the game since week 1. According to the interviews, CG participants suggested that it was because there was no teacher to supervise or assist. Specifically, they had shunned away the English usage because (1) they had trouble expressing themselves in English ($n = 9$), (2) playing in Chinese is more fun ($n = 9$), and (3) there was no one to enforce the English usage ($n = 4$). As indicated by the following interviewees:

I17: It took us a very long time to translate everything we wanted to say to play the game, making the silences very boring.

I21: We had enough pressure from school, so we used Chinese because it was easier and made the experience fun.

I22: The teacher wasn't there [to oversee the practice], right?

The EG, on the other hand, persisted in using English for the DGBLL activities in the entire experiment. This persistence, which benefited the four measured learning outcomes, was because of the presence of teacher immediacy. Just as EG5 suggested:

I5: The teacher consistently encouraged us to say more in English and helped us to make English expressions.

Therefore, the teacher's appearance, with their immediacy behaviors such as helping students making expressions or encouraging students to use English, become an indispensable factor in maintaining the immersive and engaging English environment that truly benefits the unmotivated students. This indicates the first significance of having teacher immediacy in DGBLL, that it helped to balance students' gaming flow and English practice

($n = 10$), steering the DGBLL activities to be both fun and educational. This point was indicated by the following sample responses:

I4: The teacher was very helpful in assisting us to construct our sentences, as the teacher explained vocabulary and grammar briefly so that we could understand and remake the sentences correctly. ... I spoke a lot more in this kind of class [DGBLL] than in school, because of the fun.

I14: Whenever I couldn't understand what others said or couldn't express myself clearly, I could very conveniently ask my teacher for help [on how to express the things I wanted to say]. ... This game was not boring at all.

The second significance of teacher immediacy in DGBLL, as evidenced by EG interviewees' responses ($n = 15$), was the opportunities for students to observe and repeat authentic English usage from the teacher for language learning purposes. For example:

I6: The teacher always corrected our mistakes by giving correct examples, and then the teacher asked us to repeat them. ... I had established a better sense of language (建立了更好的语感) during the game.

I11: The teacher helped me translate what I wanted to say from Chinese to English many times and I repeated them many times. Eventually, I learnt these sentences and the vocabulary within.

Last but not least, the third significance of teacher immediacy in DGBLL was that teacher immediacy could identify individual needs and give care to students, thus promoting students' engagement. Due to high levels of self-consciousness, some EG students ($n = 5$) in this experiment had not actively participated in the DGBLL experience. As a result, the teacher encouraged these students by (1) giving brief additional after class, (2) helping to translate between Chinese and English, and (3) teaching high-frequency vocabulary and grammar. The following sample interviewees identified and appreciated these teacher immediacy behaviors:

I11: In the first few weeks, I had trouble remembering the English words for different identities. So the teacher gave me a list of the identities in both Chinese and English so that I could use it to play better. ... The teacher also asked me to stay after class one week to explain how the game works to me and encourage me to speak more during it.

I15: The teacher had always asked me to repeat the English translations, which I didn't like. But after I repeated the correct English sentence, the teacher had always praised me. So I became more active [in speaking English for the game].

Hence, based on the previous findings, we suggest that teacher immediacy may play an important role in DGBLL. It is not only that, without teacher immediacy, students who are not talented at English are likely to give up on the English practice opportunity by choosing

the easy way out, but teacher immediacy in the EG appeared to optimize students' flow experience and develop motivation for active DGBLL engagement and English learning.

Discussion

This study examined the potential role of teacher immediacy in DGBLL activities in relation to intrinsic motivation, WTC, and classroom anxiety in promoting intrinsic motivation, WTC and alleviating classroom anxiety for amotivated EFL students. The quantitative data suggest that teacher immediacy may be a promising form of support in DGBLL to support the meaningful communication emphasized by interactionist perspectives. From the qualitative data, we identified the significance of teacher's immediacy in maintaining an immersive and engaging environment as well as in balancing and optimizing students' experience in both game and practice, explaining the quantitative findings.

Similar to previous studies that claimed the benefits of DGBLL activities in EFL students' learning motivation, classroom anxiety, and WTC (Acquah & Katz, 2020; Chen et al., 2020), this study finds that DGBLL activities could bring such benefits to students. However, different from those studies, which are typically conducted under out-of-class situations with little involvement of teacher immediacy (e.g., Li et al., 2021), this study argues that the inclusion of teacher immediacy may be particularly important for enabling a wider range of EFL students to benefit from the DGBLL activities. This difference possibly originated from the sampled students. In such studies like Li et al. (2021), the participants were college students who had used to using digital tool for preparation for a coming exam, indicating a strong sense of self-regulation in behaviors. The participants in this study, however, were high school students with below-average performances, indicating lower levels of self-regulation abilities. Therefore, the significance of teacher immediacy in DGBLL may vary among different groups of students.

However, the influence of teacher immediacy in DGBLL may be significant not only among these amotivated high school students with less favorite characteristics in EFL education (e.g., low motivation to learn), but among all high school students. As reviewed in section 2.1.3, a lack of WTC prevails among all EFL students in many different cultures (Kruk, 2015; Lee & Lee, 2019; Zhou et al., 2023). The situation could be even grimmer in China, as studies (e.g., Cheng & Xu, 2022) have suggested that low levels of WTC prevails among students with above-average English proficiency as well. Therefore, since teacher immediacy is one of the solutions to students' disengagement in meaningful English communications in DGBLL, the practical application of this study extends beyond the sampled sub-optimal students to potentially all EFL students.

Even for those with high levels of WTC, teacher immediacy in DGBLL could be of value too. As found by this study, teacher immediacy in DGBLL can (1) help to balance students'

gaming flow and English practice, (2) provide opportunities for students to observe and repeat authentic English usage, and (3) identify individual needs and give catered care, all of which extend beyond DGBLL's basic benefits such as immersive and engaging learning environment. As suggested by Yang and Chen (2020), individual differences played vital roles in students' achievements from DGBLL experiences in which some would skip learning contents and some needing assistance in the game. Therefore, teacher immediacy may be necessary with such considerations for it balances gaming and learning, as well as provides catered care. Moreover, the benefits of DGBLL activities are subject to the game design, it is believed that factors such as digital gameplay behavior and digital learning behavior can all impact the results of students' language-related outcomes, especially in Chinese EFL settings (Yang & Chen, 2020; Zhou, 2024). Since individual differences make students behave differently in the same game and the designed game may not be considerate to students with all different characteristics, teacher immediacy, with its effects in identifying individual needs and providing catered care, may function as an important lubricant that helps to improve the DGBLL experience for many students.

Furthermore, teacher immediacy served as an external regulator contributes to the development of intrinsic motivation. Although participants in this study did not specify in the qualitative interviews, the quantitative data did suggest significantly better results in their intrinsic motivation to EFL learning. This finding could be interpreted from the perspective of the self-determination theory. Functioning as an external regulator, teacher immediacy, with academic support behaviors such as feedback and encouragement, could internalize over time and become a part of students' intrinsic motivation (Shin & Bolkan, 2021; Zhang & Papi, 2024). Evidenced by this study, as "natural consequences tak[ing] over" (Cameron & Pierce, 2002, p. 61) (i.e., they find themselves being able to communicate meaningfully with others for the game and learn something in it), students became more active in using English to play the game and more open to teacher's corrections and requirements, indicating the internalization process and further suggesting the significance of teacher immediacy in DGBLL.

Despite these benefits, integrating teacher immediacy into DGBLL is not without practical constraints. First, providing continuous immediacy behaviors during fast-paced gameplay can increase teachers' cognitive load and workload (Zhang, 2025), especially in large classes where many students simultaneously require support. Second, a strong teacher presence may unintentionally reduce the self-directed and exploratory nature (Zhang et al., 2026) that is often considered a key advantage of game-based learning. To address these concerns, teacher immediacy in DGBLL may need to be designed as a form of scaffolding that can be gradually withdrawn as students become more autonomous, confident, and capable in using English during digital gameplay.

Conclusion and suggestions for further research

From the interactionist theory, we deliberated the demand of an external regulator in DGBLL for students with less favorite individual differences in foreign language acquisition, leading to the design of this experimental study with teacher immediacy as the intervention. With both quantitative and qualitative data, we found evidence to the significance of teacher immediacy in DGBLL and further discussed its broader implications in the discussion section. As a pioneer study investigating teacher immediacy's effects in DGBLL, we welcome other studies with structural modelling equations or idiodynamic approaches to further well-round the scholarly comprehension in this research gap. Moreover, although CG had quickly given up on English-mediated game play without teacher immediacy, resulting to an incompatible condition to compare post-test results after the intervention, the lack of between-group post-test comparison weakened the internal validity of the quantitative findings. Therefore, the observed pre-post improvements in the experimental group should be interpreted as the result of suggestive rather than definitive causal effects. Future studies are encouraged to adopt alternative DGBLL designs that can sustain target-language use to further validate the mechanism of teacher immediacy.

Abbreviations

CG: control group; DGBLL: digital game-based language learning; EFL: English as a foreign language; EG: experimental group; WTC: willingness to communicate.

Author's contributions

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