The Impact of Hybrid Learning Mode on Chinese Language Proficiency and Engagement of International Students: a Study of Chinese as a Foreign Language Learning

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Abstract

With the profound changes in the language learning environment driven by technolo gy, and the increasingly prominent status of Chinese as a global language, it is necessary to have an indepth understanding of the multifaceted impact of technology and languag e learning tools such as ClassIn on Chinese learnin.

This study aims to explore the effectiveness of Class-in in blended teaching for Chinese language skills (listening, reading, and writing), as well as to investigate the impact of engagement levels on language learning outcomes among second language learners of Chinese in a blended learning context.The research subjects were 95 Chinese language learning international students from a university in Yunnan province, China, using quantitative research methods. Research tools included pre-test and post-test scores for control and experimental groups, as well as an online engagement questionnaire. Data analysis was conducted using SPSS26.0 for paired-sample t-tests and multiple linear regression. The results show that the hybrid teaching based on Classin is helpful to improve students' listening and reading level, while the traditional teaching about writing is more dominant. The improvement of students' listening, writing and reading is mainly due to students' independent participation in Classin teaching. The multi-modal function of Classin promotes the improvement of listening and writing, but interferes with reading learning. Peer involvement has no effect on blended learning. This study has important implications for Chinese language teachers, learners, linguists, school decision makers and classroom platform managers.

Keywords: The Impact of Hybrid Learning Mode; Chinese Language Proficiency; Engagement of International Students; Foreign Language Learning.

Introduction

As more students from different parts of the world choose to study Chinese, there is a need to explore effective teaching methods to enhance their language learning experience.

Hybrid learning, also known as blended learning, has been defined and discussed in various educational literature. Ranganathan et al. (2007) define hybrid learning as "the thoughtful integration of classroom face-to-face learning experiences with online learning experiences". Researchers have explored the effectiveness of blending traditional face-to-face instruction with online learning components in language education. (Jiang et al., 2021; Klimova

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& Kacetl, 2015). Additionally, Focusing on English language teaching methodologies and educational technology often discuss the integration of blended/hybrid learning in language education(Bueno-Alastuey & López Pérez, 2014; Sari et al., 2018). Overall, the literature suggests that blended/hybrid learning approaches offer promising opportunities for improving language learning outcomes.

leveraging class-in platforms in blended teaching can offer opportunities for innovative pedagogical practices, increased learner interaction, and improved learning outcomes. Some literatures have investigated the use of class-in platforms for facilitating synchronous and asynchronous learning activities. (Wang et al., 2022; Di Wang & Yu Huang, 2022). The literatures on the application of class-in platforms in the blended teaching of Chinese are emerging, with a growing focus on leveraging technology to enhance speaking learning experiences. (Chen, 2022; Liu, 2012; Zhao, 2020). Additionally, conference proceedings and research articles have examined the use of class-in platforms for promoting cultural immersion, providing feedback on Chinses character proficiency, and fostering collaborative learning among students of Chinese(Liu, 2012; Xu et al., 2021).

Basilaia et al. (2020) suggested that blending face-to-face instruction with online learning activities can increase student motivation, participation, and interaction with course materials. Furthermore, the incorporation of multimedia resources, collaborative tools, and interactive learning environments in blended courses enhances students' active involvement in the learning process, fostering a sense of connection and community among peers and instructors(Bergdahl & Hietajärvi, 2022; Ehsanifard et al., 2020; Eliveria et al., 2019). Overall, the literature underscores the role of blended learning in promoting deeper engagement and improved learning outcomes among learners across diverse educational contexts.

Across literature reviews, there is abundant research on blended teaching, especially in English language instruction, spanning various fields. However, when it comes to applying blended teaching to Chinese as a second language (CSL), the focus has been primarily on cross-cultural teaching, Chinese characters, and writing instruction. This study aims to address this gap by exploring the effectiveness of using Class-in for blended teaching in Chinese language listening, reading, and writing instruction.

Research on engagement spans multiple fields such as education, linguistics, and psychology, yet studies specifically focusing on language teaching are limited, particularly in online engagement. This study will investigate the impact of engagement levels among second language learners of Chinese in a blended learning context on language learning outcomes, including listening, reading, and writing skills. This aspect will be examined as another facet of the research.

Research Objectives

The research objectives can be abbreviated as follows:

1.To explore the effectiveness of Class-in in blended teaching for Chinese language skills (listening, reading, and writing).

2.To investigate the impact of engagement levels on language learning outcomes among second language learners of Chinese in a blended learning context.

Literature Review

Krashen input hypothesis theory (KIHT) for Listening

Krashen argues that the most effective way of language acquisition is through exposure to appropriate language input, known as "i+1" input, Such input facilitates language acquisition and drives language proficiency development(Cook & Cook, 1993) . Offering Rich Input: in listening teaching, teachers can provide ample listening materials, to enrich the language input learners are exposed to.(Liu, 2015).

In listening teaching, teachers can use authentic language materials such as recordings, videos, real conversations, etc., and create authentic language contexts such as simulating real conversations help learners better understand and acquire language.

Cognitive linguistics theory (CLT)for Reading

Linguist Noam Chomsky posits that all natural languages share some basic grammatical structures, which constitute Universal Grammar(Yussof et al., 2012). Chomsky emphasizes the creativity and flexibility of language, Humans can create new vocabulary, sentences, and expressions as needed to adapt to various communicative demands (Evans, 2012). Cognitive linguistics plays an important role in reading learning, as mentioned in Verhoeven et al. (2011), where it states that cognitive linguistics theory suggests language knowledge is constructed through personal experiences and cognitive activities.

Cognitive linguistics theory emphasizes the use of various cognitive strategies by learners during the reading process to enhance comprehension and memory. These strategies include prediction, inference, summarization, association, etc. By employing these strategies, learners can engage in reading learning more effectively.

Expressivist Theory (ET) for Writing

The Expressivist Theory was proposed by American educator and scholar James Britton. This theory advocates that writing is a process of expressing and communicating personal thoughts, emotions, and experiences (Altieri, 2003). Therefore, the purpose of writing is not only to convey information but also to demonstrate individual uniqueness and personality traits(Charlow, 2015).This theory is also applicable to second language writing instruction. The article mentioned in Elbow (2015) discusses how to guide students to express personal viewpoints and emotions in the writing process, as well as how to use writing to explore and discover language and self.

The Expressivist Theory can be applied to online writing instruction by emphasizing the importance of encouraging students to express themselves authentically and creatively in their writing.

Social Learning Theory (SLT) for Peer Engagement

Social Learning Theory (SLT), Albert Bandura's theory underscores observing, modeling, and imitating others, and the interplay of environmental and cognitive factors in shaping behavior (Hill et al., 2009; Lantolf & Pavlenko, 1995). Building on Skinner's classical conditioning, Bandura highlights mediation between stimuli and responses, and behavior acquisition via observational learning (McLeod, 2011).

In the context of online learning, this means that peers can serve as models for each other, demonstrating effective learning strategies, problem-solving techniques, and collaborative skills.

Multi-modal Learning Theory (MLT) for Multi-modal Engagement

The main proponent of the Multimodal Learning Theory is Richard F. Mayer. Mayer suggests that learners receive information through multiple sensory channels

simultaneously(Gilakjani et al., 2011), Learners can utilize various forms of representation which helps them to understand and memorize knowledge more deeply (Di Mitri et al., 2018).In this article Giannakos and Cukurova (2023) the authors introduce various interactive learning environments' characteristics and advantages and how to utilize these environments to facilitate learners' understanding and memory.

In the context of Multi-modal Engagement, this means designing learning experiences that incorporate diverse media formats, interactive elements, and hands-on activities to engage learners through different senses.

Self-directed Learning Theory （SDLT） for Self-directed Engagement

The theory of self-directed learning emphasizes the proactive role individuals play in the learning process, regarding learners as agents who autonomously determine their learning direction and methods (Leach, 2000) . The theory of self-directed learning views the learning process as a cyclical one, involving experience, observation and reflection, conceptualization, and experimentation. (Song & Hill, 2007) .

According to the theory of self-directed learning, learning motivation is one of the important factors driving learners to engage in self-directed learning. Self-directed learners typically possess higher intrinsic motivation; they actively participate in learning activities because of their interest and enthusiasm for the learning content, thereby achieving learning outcomes more easily.

Conceptual Framework

This study compared the use of Classin platform in Chinese teaching between 50 students in the experimental group and 45 students in the control group. The experimental group used the Classin platform for mixed teaching, and the control group used the traditional method for teaching. After eight weeks of classes, the two groups were compared to see if there were any differences in listening, reading, and writing. At the end of the course, the experimental group was given an engagement questionnaire to investigate their participation in blended teaching. The research framework is shown in Figure 1.

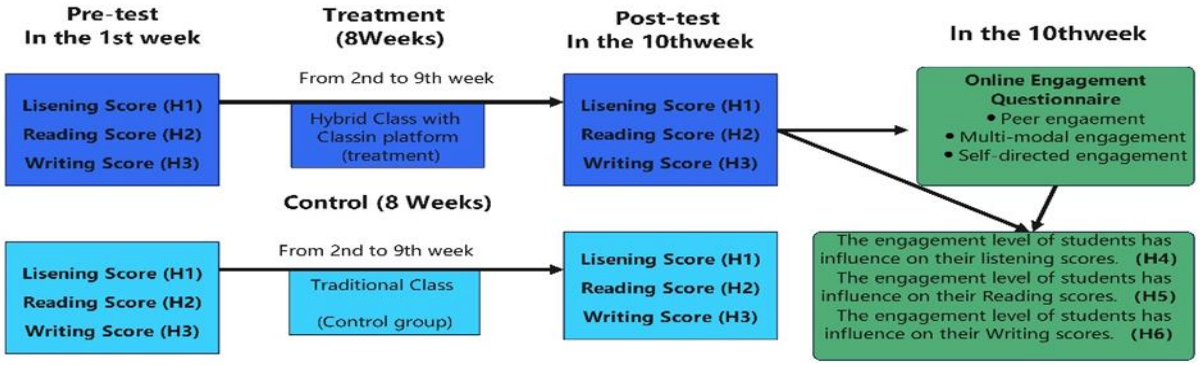

Figure 1. Conceptual framework

Based on the conceptual framework, the hypotheses were developed as follows.

Hypotheses Testing

$H_0$1 There was no significant difference in the listening scores between the control group and the experimental group before and after the intervention.

Ha1 There was significant difference in the listening scores between the control group and the experimental group before and after the intervention.

$H_0$2 There was no significant difference in the reading scores between the control group and the experimental group before and after the intervention.

Ha2 There was significant difference in the reading scores between the control group and the experimental group before and after the intervention.

$H_0$3 There was no significant difference in writing scores between the control group and the experimental group before and after the intervention.

Ha3 There was significant difference in writing scores between the control group and the experimental group before and after the intervention..

$H_0$4 The engagement level of students (including peer engagement, multi-modal engagement, self-directed engagement) have no influence on their listening scores.

Ha4 The engagement level of students (including peer engagement, multi-modal engagement, self-directed engagement) have influence on their listening scores.

$H_0$5 The engagement level of students (including peer engagement, multi-modal engagement, self-directed engagement) have no influence on their reading scores.

Ha5 The engagement level of students (including peer engagement, multi-modal engagement, self-directed engagement) have influence on their reading scores.

$H_0$6 The engagement level of students (including peer engagement, multi-modal engagement, self-directed engagement) have no influence on their writing scores.

Ha6 The engagement level of students (including peer engagement, multi-modal engagement, self-directed engagement) have influence on their writing scores.

Research Methodology

Research design

This study adopts a quantitative research method combining quasi-experimental design and survey to comprehensively understand the impact of blended learning on Chinese language teaching and classroom engagement. This approach allows for a thorough examination of the effects of blended learning, using Class-In as the platform, on language acquisition among learners of Chinese as a second language, including listening, reading, and writing skills. Two classes are assigned to the experimental group, while two classes are assigned to the control group. Prior to the experiment, in the first week both groups undergo a pre-test at the HSK3 level to ensure they have similar levels of prior knowledge. Informed consent forms are obtained from all students before the experiment. The experimental group receives blended learning instruction using Class-In platform for eight weeks, while the control group receives traditional instruction in a regular classroom setting covering the same content. In the tenth week Post-tests and online engagement surveys are administered to students after the completion of the experiment.

Population and Sample

All 95 international students studying Chinese will be included in this research. The school provides them with a series of Chinese language courses to enhance their Chinese language experience. Among the participants, there are 26 male students and 69 female

students, with an average age ranging from 17 to 24 years old. The students come from different regions: From South Asia, Southeast Asia, and African, respectively. Their duration of studying Chinese is 2 to 3 years. On average, their Chinese proficiency level is at HSK levels 2 to 3. They have previously taken Chinese language classes either in traditional classrooms or online, but none of them have used the Class-In platform before. The Census sampling technique is applied, Due to the limited number of international students enrolled in Chinese language courses, conducting a comprehensive census might be impractical.

Research Instrument

Performance Test

The HSK (Hanyu Shuiping Kaoshi) is a standardized Chinese proficiency test designed for non-native speakers of Chinese. It assesses individuals' abilities to use Chinese in daily life, academic, and professional contexts. The exam is internationally recognized as a standardized measure of Chinese language proficiency(Peng et al., 2021). The content level 3 of HSK was shown in Table1.

The test is divided into six levels, with levels 1-2 covering listening and reading, and levels 3-6 covering listening, reading, and writing. The listening section of HSK3 aims to assess candidates' basic oral communication skills in daily life and work scenarios. The reading section of HSK3 examines candidates' understanding of common Chinese texts and language structures encountered in simple daily life and work contexts. The writing section of HSK3 requires candidates to express their thoughts and opinions using simple Chinese language (Lu, 2017).The HSK's validity is supported by its alignment with the Common European Framework of Reference for Languages (CEFR) and its ability to accurately measure different levels of speaking proficiency (Teng, 2017). The validity of the HSK has been established through various research studies and validation processes. It has undergone rigorous item development, pilot testing, and statistical analysis to ensure its reliability and validity.

Table 1. Operationalization Table of "Online Engagement Questionnaire (OEQ)"

Variables	Definition	Operationalization	Source	Scale
Listening competence	Listening ability involves the skill of processing and interpreting auditory information, including recognizing speech sounds, words, phrases, and	HSK3 Chinese test. The listening material will be played twice. **Part I** 10 questions. Choose the corresponding pictures according to what they hear. **Part II** 10 questions. Judge whether the content of the sentence is consistent with the paragraph. **Part III** 10 questions. Choose the answer according to what they hear conversation. **Part IV** 10 questions. Choose the answer according to what	HSK of Chinese Testing International Center (CTI) is a globally recognized	The listening section is **100**, with **60** as the passing score. **Part1**, 2 points/item, 10 questions with **20 points**. **Part2**, 2 points/item, 10 questions with **20 points**. **Part3**, 3 points/item, 10

	understanding their meanings, nuances, and context. (Vandergrift, 2006)	they hear multi-round conversation. The system will score based on the standard answer.	Chinese language testing institution.	questions with **30 points**. **Part4,** 3 points/item, 10 questions with **30 point**s.
Reading competence	Reading ability involves interpreting and comprehending written text, recognizing words and their meanings, understanding sentence structures, and grasping the main ideas, details, and implications of the content. (Raudszus et al., 2019)	HSK3 Chinese test. **Part I** 10 questions and 20 sentences. Find out the connections and correspond them one by one. **Part II** 5 sentences and 5 conversations. Find the right words from the options to fill in the blank. **Part III** 10 questions. Choose the answer from 3 options. Grading teacher will score based on the standard answer	HSK of Chinese Testing International Center (CTI) is a globally recognized Chinese language testing institution.	The reading section is **100**, with **60** as the passing score. **Part1**, 3 points/item, 10 questions with **30 points**. **Part2**, 3 points/item, 10 questions with **30 points**. **Part3**, 4 points/item, 10 questions with **40 points**.
Writing competence	Writing ability involves constructing coherent sentences and paragraphs, using correct grammar and vocabulary, and organizing content logically to communicate effectively in written form. (Dryer, 2013)	HSK3 Chinese test. **Part I** Consists of 5 questions. There are several words in each question, and candidates should form a sentence according to the correct word order. **Part II** Consists of 5 questions Which has a sentence with blanks and pinyin hints. Candidates should write correct Chinese characters. Grading teacher will score based on the standard answer	HSK of Chinese Testing International Center (CTI) is a professional international Chinese education and examination service company.	The writing section is **100**, with **60** as the passing score. **Part1**, 10 points/item, 10 questions with **50 points**. **Part2**, 10 points/item, 10 questions with **50 points**.
Total score	Total score is 300 points, with 100 points each for listening, reading, and writing. To pass HSK Level 3, the total score needs to be 180 points, with individual scores of each subject exceeding 60 points.			

Questionnaire

Students' engagement is measured using the Online Engagement Questionnaire (OEQ). It is a research instrument designed to measure the engagement by participants in online learning environments. The Online Engagement Questionnaire (OEQ) consists of four dimensions: Peer Engagement (PE), Multi-Modal Engagement (ME), Instructor Engagement (IE), and Self-Directed Engagement (SDE). Among these, peer engagement (7 items), multi-modal engagement (7 items), and instructor engagement (7 items), self-directed engagement (5 items) (Bolliger & Martin, 2020). The content questionnaire was shown in Table2.

The engagement variables are assessed using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). In this study, three dimensions (PE, ME, SDE) were selected as research variables. To enhance questionnaire respondent engagement, a shift was made in the narrative perspective of the items. For instance, the item "Students peer-review classmates' work" was modified to "I peer-review classmates' work in Class-in platform."

In this study, the validity of the research was ensured through the use of the IOC test questionnaire, the IOC instrument underwent a review by a panel of three experts. These experts were chosen because they had at least ten years of experience in teaching Chinese as a foreign language at higher education institutions in China. They also possessed experience in online Chinese language instruction. One had a Ph.D. specializing in curriculum, another in linguistics, and the third in international Chinese education. All three were associate professors. The experts were asked to make revisions, additions, or deletions to statements based on their experience in online teaching and research methods. Following the expert feedback, the online participation questionnaire consisted of 3 variables and 19 items. All 19 items were deemed acceptable.

In this study the reliability of the Online Engagement Questionnaire was measured by pilot study the result revealed an internal consistency coefficient of 0.87 for the tool. The reliability of all sub scales was satisfactory: (1) Peer engagement ($\alpha = 0.74$), (2) Multi-modal engagement ($\alpha = 0.80$), and (3) Self-directed engagement ($\alpha = 0.70$), the date considered acceptable for research purposes, indicating a reasonable level of internal consistency.

Table 2. Operationalization Table of "Online Engagement Questionnaire (OEQ)"

Variables	Definition	Operationalization	Scale
Peer engagement	Peer engagement refers to students' involvement with their peers in the online courses. (Bolliger & Martin, 2020).	1.I use an ice-breaker discussion to introduce myself on the ClassIn platform. 2.I work collaboratively using ClassIn platform communication tools to complete case studies, projects, reports etc. 3.I interact with peers through ClassIn platform (asynchronously or synchronously). 4.I peer-review classmates' work on the ClassIn platform. 5.I get an opportunity to reflect through the instructor provides (e.g. via an electronic journal or surveys) on the ClassIn platform. 6.I moderate discussions on the ClassIn platform.	5level Likert scale Strongly agree (5) Agree (4) Neutral (3) Disagree (2) Strongly Disagree (1)

		7.I was required to rate individual online performance of team members on projects on the ClassIn platform.	
Multi-modal engagement	Multi-modal refers to a variety of modes and, in this case specifically, to content Delivered through a variety of media including text, audio, video, animation and images. (Bolliger & Martin, 2020).	1.I experience live,synchronous web conferencing for class events and/or guest talks on the ClassIn platform. 2.My instructor uses various features in synchronous sessions to interact with us (e.g. polls, emoticons, whiteboard, text or audio and video chat) on the ClassIn platform. 3.My instructor creates short videos to increase his/her presence in the course on the ClassIn platform. 4.My instructor provides feedback using various modalities (e.g. text, audio, video and visuals) on the ClassIn platform. 5.I post audio and/or video files in threaded discussions instead of only written responses on the ClassIn platform. 6. I interact with content in more than one format (e.g. text, video, audio, interactive games or simulations) on the ClassIn platform. 7.I complete an integrated profile on the learning management system that is accessible in all courses on the ClassIn platform.	5level Likert scale Strongly agree (5) Agree (4) Neutral (3) Disagree (2) Strongly Disagree (1)
Self-directed engagement	Self-directed engagement refers to student involvement with multiple forms of resources, activities and opportunities to create meaningful learning experiences in the online course. (Bolliger & Martin, 2020)	1.I search for and select online applicable materials (e.g.articles, books)based on my interests on the ClassIn platform. 2.I use optional online resources to explore topics in more depth on the ClassIn platform. 3.I have choices in the selection of readings (articles, books) that drive discussion group formation on the ClassIn platform. 4.I research an approved topic and present their findings in a delivery method of my choice (e.g. discussions forum, chat, web conference, Multimedia presentation) on the ClassIn platform. 5.I work on realistic scenarios to apply content (e.g. case studies, reports, research papers, presentations) on the ClassIn platform.	5level Likert scale Strongly agree (5) Agree (4) Neutral (3) Disagree (2) Strongly Disagree (1)

Research treatment process

This study adopts the "Intermediate Chinese Comprehensive Course" textbook published by Beijing Language University Press. The learning content encompassed a total of 8 units, with a portion of each unit being taught through traditional offline classroom instruction and another portion conducted via the Classin platform. The specific intervention process is illustrated in Figure 2.

Pre-class preparation involves: 1. Developing a teaching plan outlining learning objectives and specific features of the Class-in platform; 2. Uploading listening, reading, and writing materials to the platform in advance; 3. Assigning pre-class tasks for students to complete related exercises and readings beforehand to enhance participation and application of knowledge during class.

Throughout the class, various interactive features of the Class-in platform are utilized to facilitate learning. During the 20-minute listening session, the platform plays audio materials and asks questions to enhance understanding. For the 30-minute reading comprehension activity, students engage with related reading materials posted on the platform, utilizing notetaking and annotation tools to record key information and participate in discussions through the discussion board or real-time chat feature. In the subsequent 30-minute writing exercise, tasks are completed, and assignments submitted using the platform's features, allowing for feedback and evaluations by teachers. Finally, in the last 10 minutes, the lesson is summarized on the platform, emphasizing the importance of listening, reading, and writing skills.

Post-class intervention and review involve providing additional resources for listening, reading, and writing exercises on the Class-in platform. This aids students in consolidating their knowledge through independent study and review.

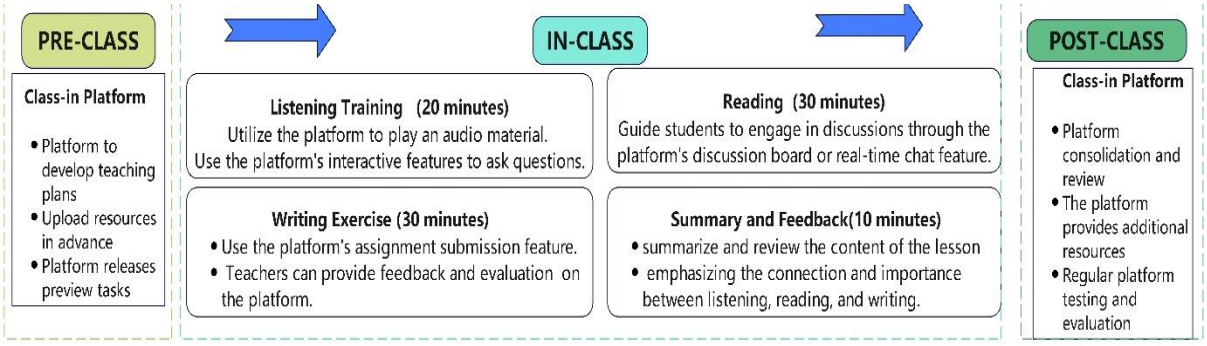

Figure 2. Treatment Process

Research Results

Demographic Information

The study includes a total of 95 students, with a gender distribution indicating that approximately 72.6% of the participants were female, while 27.4% were male. In terms of age, the sample demonstrates a diverse range, with 43.2% falling within the 19-21 age group, followed by 31.6% in the 16-18 age range and 25.3% in the 22-24 age category. Regarding nationality, majority of participants (65.3%) originate from Thailand, with Myanmar (Burma), Indonesia, and Vietnam making up smaller proportions of the sample. This detailed demographic overview sets the stage for exploring the impact of hybrid learning on Chinese proficiency and engagement within the context of Chinese as a Foreign Language Learning.

Table3. Demographic Information of Samples

Category	Content	Frequency	Percentage
Gender	Male	26	27.4%
	Female	69	72.6%
	Total	95	100%
Age	16-18	30	31.6%
	19-21	41	43.2%
	22-24	24	25.3%
	Total	95	100%
Nationality	Thailand	62	65.3%
	Myanmar (Burma)	14	14.7%
	Vietnam	3	3.2%
	Indonesia	11	11.6%
	Mali	3	3.2%
	Ethiopia	2	2.1%
	Total	95	100%

Descriptive Statistics of Questionnaire

Table4 has displayed the engagement of international students learning Chinese through a hybrid approach on the Class-In platform, involving 3 variables and 19 factors. The overall mean is 4.16, indicating "agree," signifying frequent participation using Class-In for learning with high enthusiasm.

Table 4. Descriptive Statistics of Questionnaire

Variables	Mean	SD	Interpretation
Peer Engagement	4.10	.886	Agree
Multi-modal Engagement	4.09	.862	Agree
Self-directed Engagement	4.30	.734	Strongly Agree
Total	**4.16**	**.872**	**Agree**

1.Result of Data Analysis for Research Objective 1: ***To explore the effectiveness of Class-in in blended teaching for Chinese language skills (listening, reading, and writing).***

To explore the effectiveness of Classin classroom teaching in the hybrid teaching of Chinese skills (listening, reading and writing). In this study, before intervention, independent sample T-test was conducted for the Chinese scores (listening, reading and writing) of the treatment group and the control group, and the results were shown in Table4. After the intervention, the Chinese scores (listening, reading and writing) of the treatment group and the control group were tested by independent sample T-test, and the results were shown in Table5.

Table 5 has compared the pre-test scores in listening, reading, and writing between the control and treatment groups using independent samples t-tests. The results indicated no significant differences in listening ($t = -0.1484$, $p = 0.882$), reading ($t = -0.1935$, $p = 0.847$) scores, and writing ($t = 0.0291$, $p = 0.977$). These findings suggest that, in the pre-test phase, there have been no significant differences in listening, reading, and writing scores between the treatment and control groups. The analysis emphasizes the baseline comparability of the two groups, supporting the assumption that any subsequent changes can be attributed to the hybrid learning intervention

Table 5. Independent Samples T-Test for pre-test control and treatment group

	tic	df	Statis	]	Mean difference	SE difference
Listening Score	Student's t	-0.1484	93.0	0.882	-0.2689	1.81
Reading Score	Student's t	-0.1935	93.0	0.847	-0.3400	1.76
Writing Score	Student's t	0.0291	93.0	0.977	0.0689	2.37

Table 6 has outlined the results of independent samples t-tests comparing post-test scores between the control and treatment groups, indicating significant differences in the listening ($t = 5.889$, $p < .001$) and reading ($t = 5.466$, $p < .001$) domains. However, in the writing domain, the t-test has yielded a non-significant result ($t = -0.888$, $p = 0.377$). In the context of hypothesis $H_0$1, $H_0$2, $H_0$3, these results support the hypothesis for writing but have not supported it for listening and reading. The analysis has underscored the effectiveness of the intervention in notable improvements in listening、reading proficiency within the treatment group.

Table 6. Independent Samples T-Test for post-test control and treatment group

		Statistic	df	p	Mean difference	SE difference
Listening Score	Student's t	5.889	93.0	< .001	9.24	1.57
Reading Score	Student's t	5.466	93.0	< .001	8.21	1.50
Writing Score	Student's t	-0.888 [a]	93.0	0.377	-1.76	1.98

2.Result of Data Analysis for Research Objective 2: ***To investigate the impact of engagement levels on language learning outcomes among second language learners of Chinese in a blended learning context.***

In order to explore the influence of Chinese second language learners' level of engagement on language learning outcomes in hybrid learning environment. The results of online engagement questionnaire and listening, reading and writing scores of the treatment group were analyzed by multiple linear regression. The analysis results of Peer engagement and listening, reading and writing scores are shown in table7. The analysis results of muti-modal engagement and listening, reading and writing scores are shown in table8, and the analysis results of self-direct engagement and listening, reading and writing scores are shown in table9.

In Table 7, The coefficients have provided insights into the individual contribution of each predictor to the listening scores. Multi-modal engagement has had a highly significant positive impact ($B = 10.876$, $p < 0.001$) on listening scores, indicating that an increase in multi-modal engagement has been associated with higher listening scores. Self-directed engagement has also had a significant positive impact ($B = 1.759$, $p = 0.044$) on listening scores. However, peer engagement has not had a significant impact ($B = -1.388$, $p = 0.197$) on listening scores. Therefore, the experimental result has rejected the null hypothesis (H04) and accepted the alternative hypothesis (Ha4).

Table 7. MLR Coefficients Model between listening score and peer engagement, multi-modal engagement, self-directed engagement

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	33.926	3.227		10.513	.000
	Peer Engagement	-1.388	1.058	-.123	-1.312	.197
	Multi-modal Engagement	10.876	1.245	.943	8.734	.000
	Self-directed Engagement	1.759	.848	.142	2.074	.044

Dependent Variable: post listening score

Analyzing the coefficients in Table 8, self-directed engagement (B = 10.536, $p < 0.001$) has emerged as a significant predictor of reading scores, with a positive impact. Multi-modal engagement (B = -6.459, p = 0.025) has also shown a significant impact, but it is negative. However, peer engagement (B = 2.479, p = 0.300) has not demonstrated a significant impact on reading scores.

Table 8. MLR Coefficients Model between reading score and peer engagement, multi-modal engagement, self-directed engagement

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	51.642	7.200		7.172	.000
	Peer Engagement	2.479	2.361	.215	1.050	.300
	Multi-modal Engagement	-6.459	2.778	-.547	-2.325	.025
	Self-directed Engagement	10.536	1.892	.830	5.568	.000

Dependent Variable: post reading score

Table 9 MLR Coefficients Model: Upon analyzing the coefficients, self-directed engagement (B = 15.167, $p < 0.001$) has emerged as a highly significant predictor of writing scores, exerting a strong positive impact. Multi-modal engagement (B = 6.262, p = 0.037) has also displayed a significant positive impact, albeit of a lesser magnitude. However, peer engagement (B = 3.068, p = 0.221) has not demonstrated a significant impact on writing scores.

Table.9 MLR Coefficients Model between writing score and peer engagement, multi-modal engagement, self-directed engagement

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	22.516	7.531		2.990	.005
	Peer Engagement	3.068	2.470	.207	1.242	.221
	Multi-modal Engagement	6.262	2.906	.412	2.155	.037
	Self-directed Engagement	15.167	1.979	.929	7.663	.000

Dependent Variable: post writing score

Research Findings

Compared to traditional teaching methods, the Class-In platform have disadvantages in Chinese writing instruction. Application of the hybrid learning group using the Class-In platform showed that the difference in writing scores compared to the traditional classroom was not significant. There might be some drawbacks in Chinese writing instruction on the Class-In platform: Difficulty in Chinese character input, Inability to demonstrate Chinese character writing skills, Limitations in cultural exchange.

The advantage of the Class-In platform is most pronounced in listening instruction. Students in the blended learning groups using the Class-In platform showed significantly higher scores in both listening and reading compared to those in traditional classrooms. Furthermore, from the average score improvements, the increase in listening proficiency was greater than that in reading. This finding suggests that the Class-In platform may have certain advantages in enhancing listening skills.

The limitations of peer engagement. On the Class-In platform, peer engagement and self-directed engagement have no impact on listening scores, reading scores, and writing scores. One possible reason for this is the quality of peer interactions: peer engagement on online platforms heavily relies on the quality of interactions among students. Perhaps the peer interactions on the platform were not substantive or meaningful enough to influence listening, reading, or writing scores. Additionally, inadequate monitoring and guidance could have played a role: effective peer engagement often requires monitoring and guidance from instructors to ensure discussions are productive and on-topic.

The effect of multi-modal engagement self-directed engagement. Through linear regression, it was evident that both multi-modal engagement and self-directed engagement on the Class-In platform significantly affected reading and listening, writing scores. This finding underscored the potential of Class-In's multi-modal engagement, which encompassed a range of multimedia features like audio, video resources, and interactive tools. By leveraging these tools, students were encouraged to actively engage with the material, leading to improvements in both listening and writing skills. Self-directed engagement can enhance students' motivation and long-term learning persistence, explore learning materials, ask questions, and self-regulation, which is often associated with better reading, listening, and writing scores. The overall finding showed as in Figure 2.

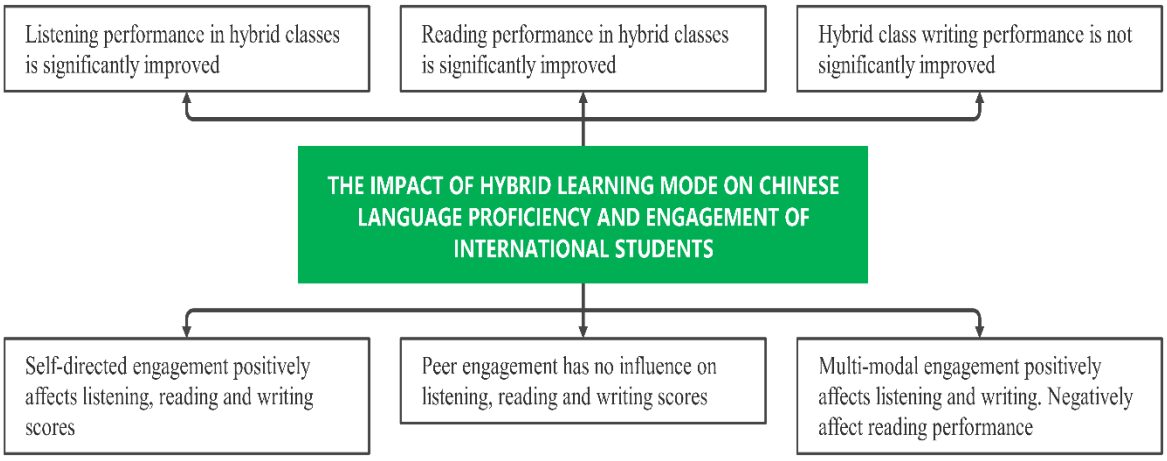

Figure 2. The overall finding

Discussion

The results showed that students in blended classrooms performed better in listening and reading than students in traditional classrooms, which was consistent with earlier research results (Huang et al., 2021; Hussein Alsowayegh et al., 2019). Regarding Chinese writing, students in mixed classes did not perform better than those in traditional classes, contrary to previous findings by D. Wang and Y. Huang (2022). Therefore, the advantages and disadvantages of traditional and hybrid writing teaching needed to be further explored.

Hussein Alsowayegh et al. (2019), Nafik (2022), and Tandiana et al. (2020) noted that listening, reading, and writing scores did not change significantly before and after the test in the traditional group, but significantly in the treatment group. However, the result of the study was that both the treatment group and the traditional group had significantly improved scores before and after the experiment. It shows that both hybrid teaching and traditional teaching can satisfy the needing of Chinese studying.

Although the effect of peer participation on listening was not significantly supported in this study, self-directed and multimodal participation had significant positive effects on listening scores. These findings are partially consistent with previous studies by East and King (2012), Ozcelik et al. (2023), and Tandiana et al. (2020), but there are some differences. It shows that the multi-dimensional function of online platform and students' self-directed learning promote listening learning.

The results of this study did not significantly support the effect of peer participation on reading achievement. Previous research by East and King (2012) has shown that positive peer interaction can improve reading outcomes. Meanwhile, in this model, multimodal participation negatively and significantly affects reading scores, contrary to the previous literature (Ozcelik et al., 2023) On the other hand, in this model, self-engagement has a significant impact on reading achievement, according to Whitney and Bergin (2018), the results of this study are consistent with previous literature. It shows that the improvement of reading performance is mainly attributed to the students' active exploration of reading materials, raising questions and seeking answers in the learning process. Multi-modal input and self-directed input have significant positive effects on writing performance, while peer input has less significant effects. These findings are partially consistent with those in related literature

(Norazmi et al., 2017; Sümer et al., 2023; Zhang & Hyland, 2018) Multimodal engagement encourages students to integrate different media forms and resources in the writing process, thereby improving writing scores, while self-directed engagement leads students to research topics in greater depth, thereby improving writing scores.

Recommendations

The research results have significant impacts on language learning, teaching, and educational institutions, and platforms like Class-In. The following suggestions will be given from three aspects: theory, policy, and practice.

Theoretical Recommendations. Alignment of Subject Characteristics and Teaching Methods, Emphasize the importance of matching teaching methods with the characteristics of the subject matter, particularly in the context of language learning. Highlight the role of multi-modal engagement in language acquisition, emphasizing the use of audiovisual materials and interactive exercises to improve listening and writing skills. Cultural Sensitivity and Language Environments, Acknowledge the need to respect cultural differences and language environments in teaching content and activities.

Policy Recommendations. Diversified Assessment System, Establish a diversified assessment system that recognizes and values different teaching modes (online, offline, hybrid) based on specific teaching needs. Investment in Educational Technology, Encourage educational institutions to invest in purchasing advanced features of educational platforms or conducting research and development to meet teaching needs.

Practical Recommendations. Enhanced Instructional Strategies, Teachers should incorporate multimedia resources and interactive tools into their teaching methods to enhance student engagement and learning outcomes. Effective Online Course Management, Provide guidance on the use of online learning resources, supervise online group discussions, and promote peer interaction. Self-Management Skills for Learners, Chinese language learners should actively engage with online resources, seek peer collaboration, and develop self-directed learning skills. Platform Optimization, Platform providers should optimize their functionalities to better support multi-modal engagement and interactive learning experiences.

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