



Generative AI Empowering Chinese Language Teaching in Vietnam: Current Applications, Empirical Investigations, and Practical Pathways

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ABSTRACT: The iterative upgrading of generative artificial intelligence (AI) has profoundly reshaped the pedagogical forms and developmental models of international Chinese language education. As a core country for Chinese learning in Southeast Asia, Vietnam witnesses robust and growing demands for Chinese language education, yet it has long confronted structural dilemmas including insufficient teacher supply, inadequate localized teaching resources, and difficulties in implementing personalized instruction. To explore the adaptability and practical value of AI technology in Vietnamese Chinese teaching, this study adopts a mixed-method research design. Based on questionnaires, semi-structured interviews, and an eight-week classroom action research involving 221 teachers and learners from universities, primary and secondary schools, and training institutions in Hanoi and Ho Chi Minh City, this paper systematically examines the application scenarios, practical effects, and localized challenges of generative AI in local Chinese pedagogy. The results indicate that generative AI functions as an effective digital pedagogical scaffold, alleviating shortages of teaching resources and professional teachers, reducing learners' foreign language anxiety, and improving the efficiency of basic linguistic training. Nevertheless, current applications are constrained by insufficient Vietnamese-Chinese bilingual corpus adaptation, inadequate teachers' AI pedagogical literacy, learners' technological dependence, and prominent regional digital divides. Grounded on the Technology Acceptance Model (TAM) and sociocultural constructivist theory, this study constructs a teacher-led and AI-assisted collaborative teaching paradigm and proposes targeted optimization pathways from four dimensions: localized resource development, teacher competency cultivation, classroom procedure reconstruction, and learner media literacy enhancement. This research fills the empirical research gap regarding intelligent Chinese language education in Vietnam and provides practical implications for the digital transformation of Chinese language education in ASEAN countries.

KEYWORDS: Chinese language teaching in vietnam, generative artificial intelligence, International Chinese language education, second language acquisition, teacher-AI collaboration.

1. INTRODUCTION

1.1 Research Background

Deepening economic, trade, and people-to-people exchanges between China and Vietnam have greatly promoted the large-scale development of Chinese language education in Vietnam. Currently, Chinese has been incorporated into the elective curriculum of primary and secondary schools in multiple regions of Vietnam, while Chinese majors are widely available in national universities. The private Chinese training industry continues to flourish, and HSK examination candidates in Vietnam consistently rank among the highest in Southeast Asia, making Chinese one of the most popular foreign languages in the country.

Nevertheless, Vietnamese local Chinese language education faces prominent structural problems. First, there is a substantial shortage of professional Chinese teachers, and local teachers demonstrate uneven teaching competence and insufficient systematic pedagogical training. Second, existing teaching resources lack localization. Most imported textbooks are designed for Chinese domestic contexts and fail to address Vietnamese learners' typical difficulties, including mother-tongue negative transfer, tonal errors, and character acquisition barriers. Third, large-class teaching dominates local pedagogy, making it difficult for teachers to satisfy personalized learning needs of students at different proficiency levels and resulting in low efficiency in oral and writing feedback.

With powerful functions including automatic text generation, multi-round voice interaction, intelligent assignment evaluation, and customized question bank construction, generative large language models provide feasible technical solutions to the bottlenecks of overseas Chinese education. The Vietnamese government has vigorously advanced national educational digital transformation and



incorporated artificial intelligence as a core driver of educational innovation. Chinese teaching institutions across Vietnam have gradually adopted AI tools to assist language instruction.

However, most local AI teaching practices mechanically replicate domestic Chinese models without fully considering Vietnam's linguistic features, educational institutions, and digital infrastructure. Such blind application leads to frequent translation deviations, poor teaching adaptability, and coexistence of technological abuse and technological resistance, which substantially limit the practical value of AI empowerment in local Chinese classrooms.

1.2 Research Questions

Based on existing research deficiencies and practical teaching dilemmas, this study addresses three core research questions: First, what is the level of technological acceptance and practical application distribution of generative AI tools among Vietnamese Chinese teachers and learners? Second, what are the core advantages and localized dilemmas of generative AI in empowering Vietnamese Chinese language teaching? Third, how can an AI collaborative teaching model adapt to Vietnamese educational contexts be constructed to form implementable optimization strategies?

1.3 Research Significance

Theoretical Significance: Existing studies on AI-enabled international Chinese education predominantly focus on macro theoretical discussions and universal teaching scenarios, while empirical country-specific research targeting Vietnam and other Southeast Asian nations remains insufficient. Taking local Chinese classrooms in Vietnam as the research field and integrating the Technology Acceptance Model and constructivist theories, this study verifies the adaptability of AI in second language teaching through first-hand empirical data. It enriches the country-specific research system of digitalized international Chinese education and fills the empirical gap of intelligent Chinese pedagogy in Southeast Asia.

Practical Significance: This study directly responds to the practical pain points of Vietnamese Chinese education, including teacher shortages, insufficient localized resources, and inadequate personalized teaching. By systematically analyzing the practical advantages and contextual obstacles of AI application, it constructs a localized teacher-AI collaborative teaching system. The findings provide operable practical solutions for local Chinese teaching reform and the intelligent transformation of Chinese language education across ASEAN regions.

2. LITERATURE REVIEW

2.1 Research on AI-Enabled International Chinese Language Education

Domestic research on AI-supported Chinese teaching can be divided into two developmental stages. The traditional intelligent teaching stage centered on character recognition, standardized question banks, and intelligent assessment, featuring single functions and weak interactivity that only satisfied basic teaching and evaluation demands. The emergence of generative AI represented by large language models has realized full-scenario empowerment covering lesson preparation, in-class instruction, after-class feedback, and personalized tutoring.

Current scholarship generally acknowledges that generative AI effectively reduces teachers' repetitive workloads, creates low-anxiety language output environments, and compensates for deficiencies in second language teaching resources. Meanwhile, researchers have warned of inherent technological limitations: model hallucinations may cause knowledge errors and cultural biases; excessive reliance induces learning inertia; and AI cannot replace teachers in emotional guidance, cultural interpretation, and high-level critical thinking cultivation. Nevertheless, most existing studies focus on domestic teaching contexts, while empirical evidence from overseas local classrooms, especially in Vietnam, remains inadequate.

2.2 Research on Chinese Language Teaching in Vietnam

Existing literature on Vietnamese Chinese teaching mainly concentrates on three domains. First, learner error studies have confirmed that Vietnamese learners exhibit typical negative transfer errors in Chinese tones, character writing, and grammatical collocations due to interference from their native tonal language and writing system. Second, textbook and resource studies have revealed the poor localization of imported teaching materials and the scarcity of targeted exercise resources adapted to local learners. Third, teacher development studies have indicated the imperfection of local teacher training systems and the uneven competence of Chinese instructors.

In recent years, a small number of studies have explored preliminary AI applications in Vietnamese Chinese classrooms, yet most



are limited to individual case summaries and lack systematic quantitative and qualitative empirical investigation. In-depth analysis regarding localized adaptation problems and technological acceptance barriers remains insufficient.

2.3 Research Gaps

Comprehensive literature review identifies three major research gaps. Firstly, theoretical adaptation gaps: existing AI teaching theories developed in Chinese contexts cannot be directly applied to Vietnam's unique linguistic and educational environments without localized empirical verification. Secondly, empirical data gaps: most prior studies rely on speculative analysis rather than mixed-method empirical evidence combining questionnaires, interviews, and action research. Thirdly, practical implementation gaps: previous optimization strategies tend to be idealized and fail to fully consider Vietnam's digital infrastructure and teacher competency constraints, resulting in poor operability. This study addresses these gaps by constructing an AI teaching system adapted to local Vietnamese contexts based on rigorous mixed-method empirical research.

3. THEORETICAL FOUNDATION

3.1 Definition of Core Concepts

Generative Artificial Intelligence: This study refers specifically to large language model-based intelligent tools with integrated functions including automatic text generation, multi-round dialogue, Vietnamese-Chinese bilingual translation, intelligent assignment evaluation, and situational teaching creation. Distinct from traditional single-function intelligent question banks and assessment systems, such tools support the entire process of Chinese teaching and learning.

Teacher-AI Collaborative Teaching: A teacher-led and AI-assisted pedagogical paradigm where AI undertakes standardized and repetitive auxiliary teaching tasks, while teachers dominate core procedures including instructional design, content verification, high-level knowledge teaching, and learning state guidance, so as to achieve in-depth integration of technology and pedagogy.

3.2 Sociocultural Constructivism (Scaffolding Theory)

Sociocultural theory proposes that learning is a socially constructed interactive process, and scaffolding serves as the core support for learners to break through their zone of proximal development (ZPD). Generative AI acts as a digital teaching scaffold, providing Vietnamese Chinese learners with real-time lexical explanation, grammatical error correction, oral simulation practice, and writing revision suggestions. Such temporary instructional support lowers the threshold of language output and enables learners to complete linguistic tasks beyond their independent capabilities.

Meanwhile, the theory clarifies the inherent limitations of AI scaffolding. Artificial intelligence cannot perceive individual learning differences or learners' emotional states, and the establishment, adjustment, and withdrawal of teaching scaffolds must be dominated by teachers. This provides solid theoretical support for the teacher-centered and AI-supplementary teaching paradigm adopted in this study.

3.3 Technology Acceptance Model (TAM)

The core variables of the Technology Acceptance Model are perceived usefulness and perceived ease of use, which directly determine users' willingness and behavioral intention to adopt new technologies. In this research, perceived usefulness refers to teachers' and learners' recognition of AI's capacity to reduce teaching burdens and improve learning efficiency, while perceived ease of use reflects tool operability, bilingual adaptation, and network accessibility.

External constraints including uneven network conditions across Vietnam, insufficient Vietnamese-Chinese teaching corpora, and inadequate teacher digital literacy significantly reduce the ease of use of AI tools. This theoretical framework effectively explains the prevalent contradiction that AI holds great teaching potential yet faces severe practical implementation barriers in local Vietnamese classrooms.

3.4 Communicative Language Teaching Theory

Communicative Language Teaching (CLT) prioritizes the cultivation of learners' practical communicative competence, emphasizing authentic situational input and continuous language output. Generative AI can efficiently create diversified daily and professional communicative scenarios, provide low-anxiety oral practice opportunities and compensate for insufficient in-class practice time.

Nevertheless, AI-generated content often lacks pragmatic appropriateness and emotional interaction inherent in real human



communication. Artificial intelligence cannot replace authentic teacher-student and peer interaction and can only function as a supplementary tool for communicative pedagogy rather than a core teaching agent.

4. RESEARCH METHODOLOGY

4.1 Research Paradigm

This study adopts a mixed-method research paradigm combining quantitative and qualitative approaches. By integrating questionnaire surveys, semi-structured interviews, and classroom action research, it ensures data objectivity and practical authenticity and effectively improves research validity and reliability.

4.2 Research Participants

Research participants consisted of Chinese teachers and students from public universities, primary and secondary schools, and private training institutions in Hanoi and Ho Chi Minh City. A total of 246 questionnaires were distributed, and 221 valid responses were collected, yielding an effective response rate of 89.8%, including 71 teacher samples and 150 learner samples. Twelve participants (6 teachers and 6 learners at different HSK proficiency levels) were selected for semi-structured interviews, with each interview lasting 35 to 55 minutes.

Furthermore, two parallel HSK-2 classes with 22 students each from a local Chinese training institution in Ho Chi Minh City were selected for eight-week comparative action research. The experimental class adopted AI collaborative teaching, while the control class implemented traditional teaching methods.

4.3 Research Instruments

First, revised 5-point Likert-scale questionnaires (teacher version and student version) were adopted, covering dimensions including AI application scenarios, perceived usefulness, perceived ease of use, practical difficulties, and training demands. The questionnaires underwent bilingual translation and back-translation and were revised by professional Chinese education experts to ensure valid reliability. Second, semi-structured interview outlines were designed focusing on AI teaching advantages, localized problems, learning risks, and teacher competency deficiencies. Third, action research tools including teaching logs, unit test scores, writing samples, and classroom observation records were applied for longitudinal data collection.

4.4 Data Processing and Ethical Considerations

Questionnaire data were analyzed statistically via SPSS 26.0. Interview transcripts were thematically coded for qualitative analysis, and action research data were compared between experimental and control groups. All participants provided informed consent prior to investigation. All personal data were processed anonymously, and strict academic ethical standards were fully observed throughout the research process.

5. RESEARCH RESULTS

This chapter presents comprehensive empirical findings triangulated from three data sources: quantitative questionnaire statistics of teachers and students, qualitative thematic coding results from semi-structured interviews, and longitudinal comparative data from eight-week classroom action research. Integrated descriptive statistics, behavioral frequency analysis, and group comparison results systematically reveal the actual adoption status, perceived attitudes, practical constraints, and instructional effectiveness of generative AI applications in Vietnamese Chinese language teaching.

5.1 Quantitative Questionnaire Results

Quantitative data in this section reflect the overall distribution of AI usage behaviors, technological acceptance levels, and perceived barriers among local Chinese teachers and student learners. All Likert-scale indicators were calculated based on mean scores and proportional frequency statistics, which objectively demonstrate the general technological application status in Vietnamese Chinese educational contexts.

5.1.1 Analysis of Teacher Data (N = 71)

In terms of specific application scenarios, teacher behavioral frequency statistics indicate hierarchical adoption of generative AI in daily teaching procedures. The most frequent usage focused on preparatory teaching assistance. Specifically, 77.4% of participating teachers regularly utilized generative AI to generate preview materials, classroom exercises, situational examples, and PPT auxiliary

resources, indicating that AI has become a conventional auxiliary tool for lesson preparation among Vietnamese Chinese instructors. Followed by grading assistance, 66.2% of teachers adopted AI to conduct preliminary screening of grammatical errors, lexical collocation mistakes, and punctuation problems in student assignments and compositions, which significantly reduced repetitive manual correction workload. In bilingual teaching support, 53.5% of teachers used AI for real-time Vietnamese-Chinese translation and bilingual semantic comparison to assist cross-language explanation and knowledge clarification in classroom instruction. In contrast, in-class interactive application remained relatively insufficient. Only 45.1% of teachers occasionally employed AI to design oral practice scenarios and simulated dialogues, while merely 21.1% integrated AI tools into real-time classroom teaching and student interaction. Notably, 32.4% of teachers reported rare or zero AI usage, reflecting obvious polarization in technology adoption among local Chinese educators.

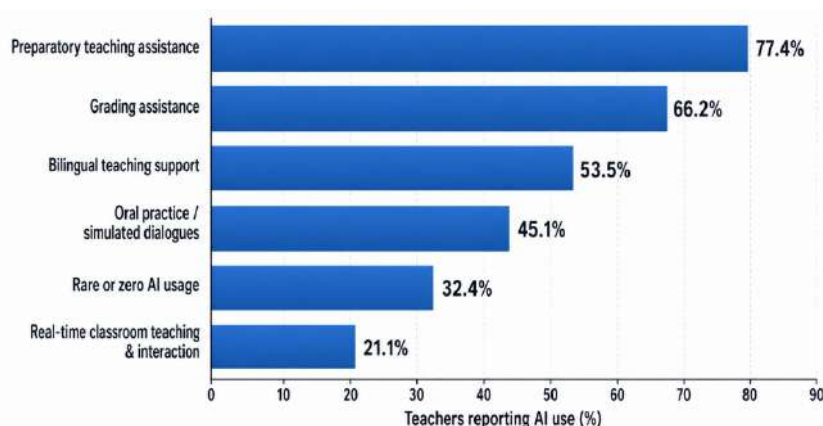


Figure 1. Frequency of Generative AI Use Across Teaching Scenarios Among Teachers (N = 71)

In terms of tool selection preference, teachers from private training institutions preferred localized Chinese learning platforms including Doubao and WanLi HSK due to their embedded HSK question banks and Chinese teaching templates, whereas university teachers were more inclined to adopt ChatGPT for open-ended text generation and academic material sorting. Paid professional AI educational tools showed extremely low penetration, with nearly 90% of teachers relying entirely on free public large-language model resources.

In terms of technology acceptance evaluation, teachers' overall perceived usefulness reached a mean score of 3.62 (SD = 0.58, full score = 5), demonstrating generally positive recognition of AI's teaching value. Most teachers agreed that generative AI effectively optimized teaching efficiency, relieved the pressure of large-class teaching, and compensated for the insufficiency of after-school tutoring resources. However, the mean score of perceived ease of use was significantly lower at 2.84 (SD = 0.63), indicating prominent practical obstacles in actual operation.

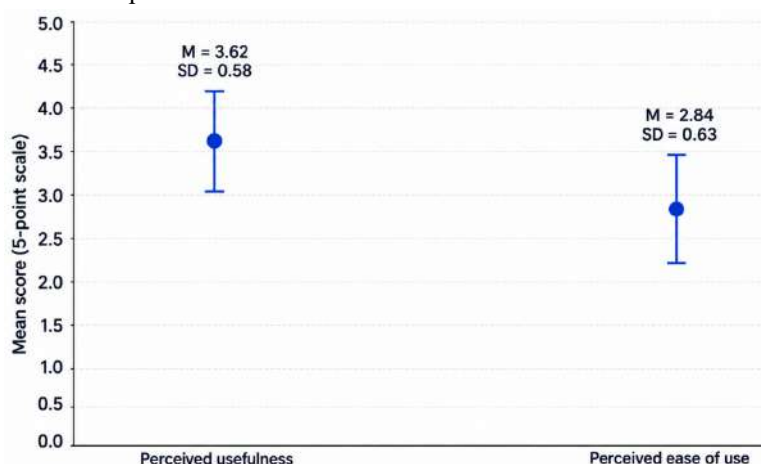


Figure 2. Teachers' Perceived Usefulness and Ease of Use of Generative AI

The primary inhibiting factors included unstable local network environments leading to frequent model loading failures, inaccurate and unnatural Vietnamese-Chinese bilingual output lacking local pragmatic features, and the absence of professional preset templates adapted to Vietnamese learners' learning characteristics.

In terms of professional development demands, up to 78.9% of teachers expressed strong willingness to receive systematic AI teaching training, covering prompt engineering, AI content verification, and technology-integrated instructional design. In sharp contrast, only 14.1% of respondents had participated in formal AI education training programs organized by schools or educational authorities, which reveals a serious mismatch between teacher training needs and existing support resources in local Vietnamese Chinese education.

5.1.2 Analysis of Learner Data (N = 150)

Student questionnaire data further supplemented the micro application status of AI tools from the learner perspective. Statistical results showed that students' AI usage scenarios were highly concentrated on basic learning assistance. A total of 72.0% of learners habitually used AI for lexical inquiry, bilingual translation, and semantic explanation to solve vocabulary and reading comprehension difficulties. Additionally, 64.7% of students adopted AI for sentence revision, paragraph polishing, and structural optimization in Chinese writing tasks, reflecting widespread reliance on AI for composition improvement. In oral learning practice, 41.3% of learners used AI for simulated dialogue training and daily communicative practice to make up for the scarcity of in-class speaking opportunities.

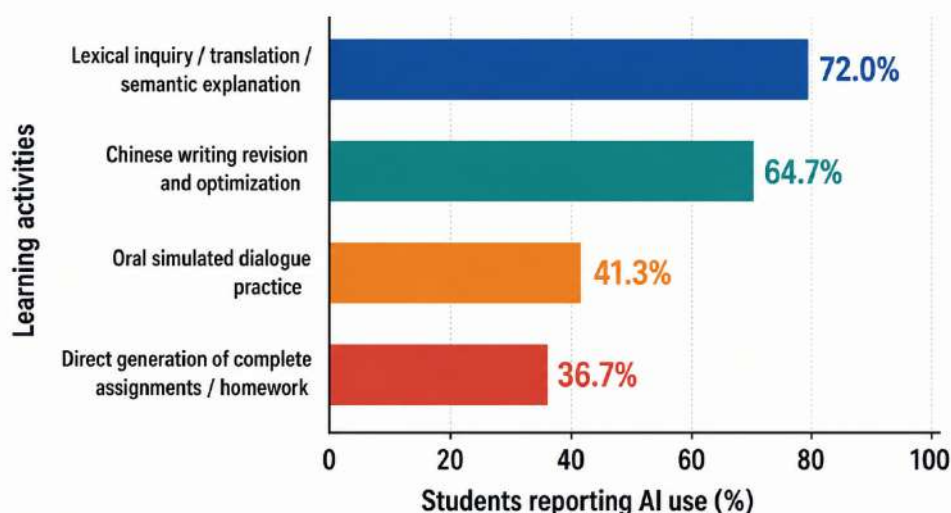


Figure 3. Generative AI Use Across Learning Activities Among Students (N = 150).

Nevertheless, the data also exposed prominent academic integrity and learning dependency risks. As many as 36.7% of students reported directly using AI to generate complete assignment answers and finished homework tasks without independent thinking, indicating a high proportion of passive technological dependence among young Vietnamese Chinese learners. In terms of technological acceptance, students' perceived usefulness averaged 3.47 (SD = 0.55), slightly lower than that of teachers, while perceived ease of use scored 2.91 (SD = 0.60). Most learners reflected that existing AI models failed to accurately identify Vietnamese learners' systematic linguistic errors, including typical tonal deviations, confusion of similar Chinese characters, and native language negative transfer grammar mistakes. Meanwhile, AI-generated exercise difficulty was frequently unstable, with superordinate or subordinate knowledge points inconsistent with learners' actual HSK proficiency levels.

Student attitudes toward AI-assisted learning presented obvious diversification. Only 42.7% of learners held fully positive attitudes and believed that AI significantly improved learning efficiency and learning interest. A total of 34.0% of students maintained neutral viewpoints, acknowledging both advantages and potential risks of AI tools. Importantly, 23.3% of learners expressed explicit concerns that long-term AI dependence would weaken their independent thinking abilities, reduce language memorization efficiency, and hinder the formation of autonomous second language learning habits.



5.2 Qualitative Interview Coding Results

Based on the thematic analysis of 12 interview transcripts (6 teachers and 6 students), four core categorical themes were extracted through open coding, axial coding, and selective coding procedures, including pedagogical advantages of AI application, localized adaptation deficiencies, learner behavioral risks, and teacher competency bottlenecks. The qualitative results effectively complemented and interpreted the statistical quantitative data, revealing the underlying causes behind numerical phenomena.

First, regarding pedagogical advantages, all interviewed teachers consistently affirmed that generative AI substantially reduced repetitive teaching labor, especially in mass homework correction, basic error screening, and conventional exercise design. With AI undertaking mechanical auxiliary work, teachers could allocate more time and energy to classroom interaction, cultural knowledge interpretation, and personalized student guidance. From the learner perspective, students generally reported that AI's anonymous and non-judgmental interactive mode effectively alleviated foreign language anxiety. Different from face-to-face classroom exercises where students feared making mistakes and being ridiculed, AI-supported oral practice provided a low-pressure, repeatable, and portable learning environment, greatly expanding learners' after-school language output volume.

Second, in terms of localized adaptation defects, most interviewed teachers emphasized the core problem of insufficient Vietnamese-Chinese teaching corpus adaptation. Current large language models are mainly trained on Chinese-English bilingual data, lacking targeted accumulation of Vietnamese learners' typical error types, pragmatic habits, and local daily communication scenarios. Consequently, AI-generated exercises failed to aim at Vietnamese students' high-frequency errors, and bilingual translation results often appeared rigid, unnatural, and inconsistent with local Vietnamese expression conventions. In addition, teachers from suburban and rural teaching sites reported frequent network instability and model stalling, which severely restricted real-time AI teaching application and resulted in obvious regional usage gaps.

Third, concerning learner behavioral risks, teacher interviews commonly reflected serious AI abuse problems in student groups. A considerable number of students directly copied fully AI-generated compositions and answers without modification, making it difficult for teachers to distinguish authentic learning outputs. Moreover, some students mechanically memorized AI-generated sentences without judging their pragmatic appropriateness. Although AI texts appeared grammatically fluent, certain expressions lacked real communicative logic and contextual rationality, which easily led to the solidification of incorrect language cognition. All interviewees agreed that AI could only solve basic linguistic problems but could not provide effective guidance for discourse logic, chapter layout, and cross-cultural pragmatic competence.

Fourth, regarding teacher competency bottlenecks, interview data indicated widespread digital literacy imbalance among local Chinese teachers. Most middle-aged and novice teachers could only master simple keyword prompting and basic tool operations, lacking systematic abilities in refined prompt design, AI output screening, error identification, and teaching scenario adaptation. Some teachers blindly trusted AI generation results and directly applied unmodified teaching materials to classrooms, causing potential knowledge misguidance. Conversely, some senior teachers held conservative attitudes toward emerging technology and completely rejected AI teaching tools, resulting in dual extremes of technological over-reliance and technological exclusion in local teaching communities.

5.3 Action Research Results

After an eight-week controlled teaching intervention, longitudinal tracking data of the experimental class (AI collaborative teaching) and the control class (traditional teaching) presented significant differences in learning effectiveness, learning behavior, and error distribution. Before the intervention, independent sample t-tests confirmed that the two parallel classes showed no significant difference in initial Chinese proficiency ($p > 0.05$), ensuring the validity of the experimental comparison.

Post-test data showed that the average final score of the experimental class reached 76.3, while the control class averaged 71.2, with the experimental group presenting an obvious overall proficiency improvement. In terms of learning process performance, students in the experimental class demonstrated higher after-class learning participation, more stable exercise completion rates, and significantly increased active oral output frequency. In writing performance, the experimental class showed a sharp decline in low-level errors including character writing mistakes, basic grammatical errors, and lexical collocation errors, which verified AI's strong effectiveness in standardized basic linguistic training.

However, further comparative analysis indicated no significant inter-group differences in high-level language competencies. The two classes showed similar performance in discourse coherence, logical connection, rhetorical appropriateness, and cross-cultural pragmatic expression. Classroom observation records revealed multiple practical limitations in AI collaborative teaching. First,



individual students in the experimental class frequently copied AI-generated sentences and paragraphs to reduce learning burden, which weakened the effectiveness of autonomous output training. Second, teachers needed to spend additional time verifying, revising, and localizing AI-generated teaching materials, indicating that AI could not completely reduce teachers' instructional workload but merely transformed the workload from repetitive creation to content auditing and optimization. Third, when teachers adopted simple and general prompts, AI often produced teaching content with mismatched difficulty, deviated scenarios, and inaccurate knowledge points, which required manual modification and secondary development.

In summary, the eight-week action research empirically validated that generative AI possesses prominent advantages in improving basic Chinese language skills and optimizing learning engagement for Vietnamese beginning-level learners. Nevertheless, AI has inherent limitations in cultivating advanced second language abilities and high-order thinking competence, which cannot replace teachers' professional instructional design, contextual judgment, and humanistic teaching guidance.

6. DISCUSSION

6.1 Core Value of Generative AI in Vietnamese Chinese Teaching

From the perspective of sociocultural constructivism, AI digital scaffolds effectively resolve core dilemmas in Vietnamese Chinese education. Firstly, AI alleviates structural teacher shortages by undertaking standardized auxiliary teaching work, freeing teachers to focus on high-level instruction and learner emotional support. Secondly, intelligent technology breaks temporal and spatial limitations of classroom teaching, reduces foreign language anxiety, and enables personalized and continuous language practice. Thirdly, customized AI material generation compensates for localized resource shortages by producing targeted exercises adapted to Vietnamese learners' tonal, character, and grammatical errors.

Consistent with the Technology Acceptance Model, although teachers and learners generally recognize AI's teaching potential, external constraints including bilingual corpus deficiencies, unstable network infrastructure, and insufficient digital literacy reduce tool usability, preventing technological advantages from being fully transformed into practical teaching effectiveness.

6.2 Localized Dilemmas of AI Application in Vietnamese Chinese Teaching

Firstly, severe lack of localized corpora. Current large language models are dominated by Chinese-English training data, with insufficient specialized Vietnamese-Chinese teaching corpora. Models cannot accurately identify Vietnamese learners' characteristic errors, and model hallucinations are amplified in localized teaching contexts, easily disseminating incorrect linguistic and cultural knowledge.

Secondly, imbalanced teacher AI pedagogical literacy. Local teachers lack systematic AI teaching training, resulting in inadequate capabilities in prompt engineering, content verification, and technology-integrated teaching design. The coexistence of excessive technological dependence and blind technological resistance hinders in-depth classroom integration.

Thirdly, prominent learner technological abuse risks. Students' inadequate media literacy leads to excessive reliance on AI for learning tasks, depriving them of essential second language trial-and-error processes and undermining autonomous thinking and language output capabilities. Students cannot effectively identify AI errors, resulting in the solidification of inappropriate linguistic habits.

Fourthly, significant regional digital divides. Uneven network and equipment resources between urban and rural areas and between public and private institutions prevent the equitable popularization of intelligent teaching resources, further exacerbating educational inequality.

6.3 Boundary Orientation of Teacher-AI Collaborative Teaching

Empirical results confirm that AI can only serve as an auxiliary teaching tool and cannot replace teachers' dominant role in education. AI is responsible for generating preliminary teaching materials, screening basic assignment errors, providing after-class Q&A and oral training, and collecting learning data. In contrast, teachers undertake irreplaceable core tasks: determining teaching objectives and instructional design, verifying and revising all AI-generated content, conducting in-class human interaction and cross-cultural teaching, guiding high-level language application, standardizing students' AI usage behaviors, and providing emotional and motivational support. The division of labor between teachers and AI forms a human-centered and technology-assisted collaborative teaching paradigm.



6.4 Localized Optimization Pathways

First, construct localized Vietnamese Chinese teaching resource systems. With the participation of Vietnamese Chinese education experts, build a specialized bilingual teaching corpus adapted to local learners' error characteristics and establish standardized localized AI prompt templates. This optimizes the accuracy of AI exercise generation, error correction, and bilingual translation and fundamentally resolves model localization deviations.

Second, establish hierarchical teacher AI competency training systems. Replace single tool-operation training with a three-level training system covering basic operation, teaching integration, and conceptual upgrading. Combining real local classroom cases, the training improves teachers' capabilities in refined prompt design, AI error identification, and technology-integrated teaching design, fostering scientific AI teaching concepts.

Third, reconstruct the whole-process collaborative teaching procedure. In the pre-class stage, teachers determine teaching objectives and learner conditions, while AI generates draft materials to be localized and verified by teachers. In-class teaching focuses on teacher-student interaction with AI as a supplementary auxiliary tool. After class, students complete tasks independently before referring to AI optimization suggestions, with teachers providing high-level academic feedback and standardized AI usage regulations to avoid plagiarism and technological abuse.

Fourth, cultivate students' digital media literacy. Integrate AI usage norms and media cognition into daily Chinese teaching. Through comparative case analysis of AI output defects, guide students to establish the concept of regarding AI as a reference tool rather than a learning substitute, clarify AI usage boundaries, and effectively avoid technological dependence.

6.5 Research Limitations

This research mainly samples participants from core urban areas in Vietnam, with insufficient coverage of remote regional samples. In addition, the eight-week action research cycle is relatively short, and the long-term teaching effects of AI collaborative teaching remain to be further verified. Future research can expand regional sampling coverage and conduct long-term tracking experiments to further optimize the localized AI collaborative teaching system for Vietnamese Chinese education.

7. CONCLUSION

Generative artificial intelligence provides new opportunities for the high-quality development of Vietnamese Chinese language education, effectively alleviating local bottlenecks including teacher shortages, resource scarcity, and insufficient personalized instruction, and offering a new path for the intelligent transformation of overseas Chinese teaching. Nevertheless, technological empowerment is highly context-dependent. Current AI applications in Vietnamese Chinese education are constrained by insufficient corpus localization, inadequate teacher literacy, student technological abuse, and regional digital divides, making automatic technological dividends impossible.

Verified by mixed empirical evidence, the teacher-led and AI-assisted collaborative teaching model is the most feasible paradigm adapted to local Vietnamese contexts. Intelligent teaching practice must adhere to human-oriented educational values and clarify the auxiliary positioning of AI technology. Through localized resource construction, hierarchical teacher training, whole-class teaching procedure reconstruction, and student media literacy cultivation, technology can be deeply and appropriately integrated into local Chinese pedagogy.

The intelligent development of country-specific Chinese education in ASEAN should abandon homogeneous replicated models from China and prioritize localized adaptation based on national linguistic characteristics, educational institutions, and digital infrastructure conditions. Continuous in-depth exploration of the integrated innovation of technology and international Chinese education will promote the high-quality and sustainable development of regional Chinese language education.

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