

Applying Artificial Intelligence technology to enhance oral proficiency among Chinese Studies students at Thai Nguyen University of Sciences

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ABSTRACT

In the context of digital transformation in education, the application of Artificial Intelligence (AI) to foreign language teaching has become an inevitable trend. This study aims to evaluate the effectiveness of applying AI technology in enhancing Chinese-speaking skills among students majoring in Chinese Studies at Thai Nguyen University of Sciences. Drawing upon the Technology Acceptance Model (TAM) and Self-Determination Theory (SDT), the study surveyed 60 students using both quantitative and qualitative methods. The AI tools utilized include ChatGPT, iFlytek AI Speech, Duolingo Max, and TalkPal. The findings reveal that perceived usefulness (PU) and learning motivation (MOT) have a significant and positive impact on speaking performance (SP), whereas perceived ease of use (PEU) primarily influences outcomes indirectly through learning motivation. Qualitative analysis indicates that most students perceive AI as a learning companion that reduces anxiety, boosts confidence, and encourages regular speaking practice. However, they still require pedagogical guidance from instructors to use the tools effectively.

The study contributes to the theoretical foundation of AI-assisted language education and proposes an integrated AI-pedagogy blended learning model for teaching Chinese speaking skills in Vietnamese higher education institutions.

Keywords:

Artificial intelligence (AI); Chinese speaking skills; Technology acceptance model (TAM); Learning motivation; Educational technology.

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I. INTRODUCTION

In the era of digital transformation in higher education worldwide, the integration of Artificial Intelligence (AI) into teaching and learning is creating new opportunities for foreign language education - particularly in developing speaking skills, which are often the most challenging to improve through traditional methods. The emergence of large language models (LLMs) such as ChatGPT, ChatGLM, and voice recognition platforms like iFlytek AI Speech, Duolingo Max, and TalkPal has enabled personalized, continuous, and real-time interactive language practice. According to Zhang et al. (2023), AI tools can simulate authentic conversational environments that help learners reduce anxiety, increase verbal responsiveness, and significantly enhance pronunciation fluency.

In Vietnam, the teaching of Chinese language is expanding across universities; however, oral proficiency training remains a major challenge. Most learners lack opportunities to interact with native speakers, tend to be shy in communication, and struggle with pronunciation self-correction. Traditional classroom activities such as pair dialogues, presentations, or recorded monologues often lack real-time feedback and depend heavily on the instructor's expertise. As Chen and Wang (2022) argue, integrating AI tools into oral instruction can create a continuous, interactive, and adaptive learning environment aligned with individual learner needs.

At Thai Nguyen University of Sciences, students majoring in Chinese Studies generally possess only average levels of technological competence. Their exposure to AI tools mainly comes from self-experience rather than structured pedagogical guidance. However, in line with the national policy of digital transformation in Vietnamese higher education, leveraging AI technologies to enhance oral proficiency among Chinese Studies students has become both a timely and practically significant research direction.

From a theoretical perspective, this study is grounded in Davis's (1989) Technology Acceptance Model (TAM) and Deci and Ryan's (2000) Self-Determination Theory (SDT), aiming to clarify how perceived usefulness (PU) and perceived ease of use (PEU) of AI tools influence learning motivation (MOT) and the development of speaking performance (SP). Moreover, drawing upon Swain's (1985) Output Hypothesis, the

study emphasizes the crucial role of interactive, feedback-based communication - an element that AI technology can simulate and sustain effectively.

Accordingly, this paper aims to assess the effectiveness of AI technology in enhancing Chinese-speaking skills among students majoring in Chinese Studies at Thai Nguyen University of Sciences. The research seeks to address the following questions:

- 1 - What are students' usage levels and perceptions of the usefulness of AI tools in oral training?
- 2 - Does the application of AI technology significantly improve students' oral proficiency?
- 3 - Which factors (ease of use, motivation, frequency of use) most strongly influence learner progress?

The findings are expected to make both theoretical and practical contributions - theoretically, by reinforcing the applicability of TAM in the context of Chinese language education in Vietnam; and practically, by proposing a feasible AI-assisted oral training model aligned with Vietnam's educational digital transformation strategy for 2025 - 2030.

II. LITERATURE REVIEW

2.1. Application of AI technology in language teaching and learning

The rapid development of Artificial Intelligence (AI) has revolutionized the way languages are taught and learned. AI-powered tools, particularly Large Language Models (LLMs) such as ChatGPT, ChatGLM, and Baidu's Ernie Bot, are expanding the capacity to simulate natural communication and provide context-sensitive feedback (Li & Zou, 2023). According to Sun and Wang (2024), AI not only assists learners in practicing pronunciation and developing speech fluency but also functions as a virtual interlocutor, enabling daily speaking practice without requiring the teacher's constant presence.

Numerous international studies have affirmed the effectiveness of integrating AI technologies into language learning. Zhao (2022) found that speech recognition applications such as iFlytek AI Speech and Google Speech API can help learners detect and correct pronunciation errors instantly, thereby improving oral accuracy. Similarly, Lai and Zheng (2021) demonstrated that AI-driven conversational chatbots significantly enhance learners' confidence and motivation in English and Chinese speaking courses.

In Vietnam, AI integration in language education remains in its early stage, mostly through self-study applications such as ChatGPT, Duolingo, Elsa Speak, and TalkPal. Recent research (Nguyen & Le, 2023; Pham, 2024) shows that students appreciate AI's immediacy and convenience but remain concerned about grammatical accuracy, contextual understanding, and the lack of pedagogical guidance. Therefore, designing an AI-based instructional model suited to the Vietnamese higher education context - especially for Chinese language teaching - remains an important research gap.

2.2. Studies on oral skill development in the context of AI application

Speaking proficiency is one of the central yet most challenging goals in foreign language instruction due to its high requirements for fluency, responsiveness, and confidence (Bygate, 2009). Traditional classroom approaches - such as pair dialogues, presentations, and recorded exercises - often fail to provide immediate feedback and sufficient practice time.

AI technologies have introduced a new mode of interactive oral learning characterized by three key features:

- (1) instant and automated feedback,
- (2) realistic conversational simulation, and
- (3) personalized learning adaptability.

Li and Yang (2023) found that AI chatbots substantially improved students' speech speed, conversational maintenance, and reduced speaking anxiety. Likewise, Sun, Xu, and Zhang (2023) reported that students who practiced speaking with AI for six weeks achieved 18% higher oral proficiency scores than those taught by traditional methods.

In the context of Teaching Chinese as a Foreign Language (TCFL), platforms such as iFlytek AI Speech, ChatGLM, and Youdao AI have proven effective in pronunciation and tone correction. Zhao et al. (2022) observed that learners improved their average HSKK (Hànyǔ Shuǐpíng Kǎoshì) score by 0.45 points after just four weeks of AI-assisted pronunciation practice. However, psychological factors such as learning motivation, attitudes toward technology, and AI acceptance remain underexplored in Vietnamese research - a gap this study aims to address.

2.3. Theoretical framework and research model

This study draws on three foundational theories to explain the relationship between technology perception, learning motivation, and oral performance outcomes:

Technology Acceptance Model (TAM) - proposed by Davis (1989), identifies two primary factors influencing technology adoption: Perceived Usefulness (PU) and Perceived Ease of Use (PEU). In language learning contexts, PU and PEU help explain learners' intentions to adopt or reject AI tools (Lai & Zheng, 2021).

Self-Determination Theory (SDT) - developed by Deci and Ryan (2000), emphasizes intrinsic motivation as the psychological driver that sustains learners' engagement and autonomy in AI-assisted speaking practice.

Output Hypothesis - introduced by Swain (1985), posits that speaking proficiency develops when learners produce language output and receive immediate corrective feedback - precisely the kind of process AI technologies can facilitate effectively.

Based on these theoretical foundations, the proposed research model assumes that perceptions of AI usefulness and ease of use (PU, PEU) influence learning motivation (MOT), which in turn enhances speaking proficiency (SP). Additionally, the frequency of AI use (AIU) acts as a moderating variable that can strengthen or weaken the effect of motivation on learning outcomes.

III. RESEARCH METHODOLOGY

3.1. Research design

This study employed a quasi-experimental design using a mixed-methods approach, combining quantitative data collected through questionnaires with qualitative data from open-ended responses and short interviews. This design enabled both the measurement of students' oral proficiency improvement and the exploration of their perceptions and experiences with AI-assisted learning (Creswell & Plano Clark, 2018).

Two groups were compared:

Experimental group: practiced speaking using AI tools (ChatGPT, iFlytek AI Speech, and Duolingo Max) for six weeks.

Control group: practiced speaking through traditional classroom-based methods.

3.2. Participants and research context

The participants were 60 undergraduate students majoring in Chinese Studies at the University of Sciences, Thai Nguyen University. Among them, 68.3% were female, 30% male, and 1.7% non-binary. Their Chinese proficiency levels were approximately equivalent to HSK 3-4, with an average level of technological competence. Only about 12% self-assessed as having above-average AI literacy.

The experiment was conducted during the second semester of the 2024–2025 academic year over a six-week period, consisting of three phases:

Week 1: AI tool training and familiarization.

Weeks 2-5: guided speaking practice using AI tools.

Week 6: post-test evaluation and qualitative interviews..

3.3. Research instruments and measurement scales

The questionnaire included five sections, adapted from the Technology Acceptance Model (Davis, 1989) and Self-Determination Theory (Deci & Ryan, 2000):

(A) Personal information

(B) Perceptions of AI (PU, PEU)

(C) Learning motivation and attitudes (MOT/ATT)

(D) Self-assessment of speaking proficiency (SP-self)

(E) Open-ended feedback

All items were measured on a five-point Likert scale (1 = strongly disagree → 5 = strongly agree). Reliability was verified using Cronbach's α (> 0.7), and construct validity was confirmed through EFA/CFA analysis (Hair et al., 2019).

Speaking proficiency was evaluated using the HSKK rubric (fluency, pronunciation, confidence, and accuracy), graded independently by two qualified instructors. Pre- and post-test scores were compared using paired-sample t-tests.

3.4. Implementation of AI tools

Three AI tools were selected for their accessibility and relevance to Vietnamese learners:

ChatGPT (GPT-4/5): 15-minute daily Chinese-language conversations on academic and daily-life topics. The AI provided real-time feedback on grammar, vocabulary, and sentence structure.

iFlytek AI Speech: pronunciation and tone recognition tool providing immediate scoring and corrective feedback on a 100-point scale.

Duolingo Max (AI Tutor): personalized self-learning platform that tracks progress and suggests contextually relevant speaking topics.

Each week, students submitted a brief report documenting practice frequency, feedback received, and pronunciation issues identified by AI. Two offline sessions with instructors were organized to ensure pronunciation accuracy and pedagogical alignment.

3.5. Data analysis

Quantitative data were analyzed using SPSS 26 and SmartPLS 4 through the following procedures:

Descriptive statistics and reliability testing (Cronbach's α);

Correlation, t-tests, and ANOVA to compare between-group differences;

Structural Equation Modeling (SEM/PLS) to test hypotheses:

H1: PU $\rightarrow$ MOT (+)

H2: PEU $\rightarrow$ MOT (+)

H3: MOT $\rightarrow$ SP (+)

H4: PU $\rightarrow$ SP (+)

H5: AIU moderates MOT $\rightarrow$ SP

Qualitative data were thematically coded using NVivo 14, identifying key themes regarding learners' perceptions and experiences with AI-assisted speaking practice.

IV. RESEARCH RESULTS

4.1. Descriptive statistics of the sample

A total of 60 students majoring in Chinese Studies participated in the survey. Among them, 68.3% were female ($n = 41$), 30.0% male ($n = 18$), and 1.7% non-binary ($n = 1$). In terms of Chinese language proficiency, 86.7% achieved the equivalent of HSK level 3–4. Most students reported moderate experience with AI tools (53.3%), while 11.7% rated themselves as fairly competent and 35.0% as basic-level users.

Overall, the sample demonstrated familiarity with AI-based learning, though their self-assessed competence varied. The frequency of AI tool usage - such as ChatGPT, iFlytek AI Speech, and Duolingo Max - for oral practice is summarized in Table 1.

Table 1. Frequency of AI tool usage in oral practice

Usage level	Number of students	Percentage (%)	Typical behavior
Daily	17	28.3	Regular daily practice; conversation with ChatGPT or pronunciation apps 10–20 minutes per day.
Weekly	28	46.7	Scheduled practice (2–3 sessions per week), typically for pronunciation drills or in-class topic review.
Occasionally	12	20.0	Irregular usage, mostly for assignments or specific tasks.
Rarely	3	5.0	Minimal interaction due to time constraints, lack of devices, or insufficient teacher guidance.
Total	60	100.0	—

(Source: Survey results)

The results indicate that 45 out of 60 students (75%) practiced speaking with AI tools at least weekly, with 17 students (28.3%) maintaining daily routines. This finding suggests a positive trend toward autonomous, technology-supported learning, especially among younger students who are accustomed to mobile learning platforms.

Notably, students in the “daily” group generally exhibited higher self-confidence and technological literacy compared with those who practiced occasionally or rarely. The latter group often cited a lack of clear pedagogical guidance from instructors or uncertainty about effective AI usage as barriers.

This distribution highlights the sustainability potential of AI-assisted oral training: when appropriately guided, most students are willing to integrate AI tools into weekly speaking practice, suggesting the feasibility of formally incorporating AI-assisted oral components into future Chinese-speaking curricula.

4.2. Detailed results by construct scales

The survey of 60 Chinese Studies students measured perceptions, motivation, and behavioral engagement with AI-assisted oral learning using five-point Likert scales. All constructs demonstrated high internal consistency, with Cronbach's α ranging from 0.82 to 0.90, indicating satisfactory reliability (Hair et al., 2019).

Table 2. Survey results by perceptual and behavioral constructs

Construct	Code	Mean	SD	Cronbach's α	Interpretation
Perceived Usefulness (PU)	PU1–PU4	3.74	0.56	0.88	Students agreed that AI improved pronunciation and speaking reflexes, enhancing learning effectiveness.
Perceived Ease of Use (PEU)	PEU1–PEU3	3.58	0.60	0.84	Most found AI tools user-friendly, though some encountered interface barriers with Chinese-language applications.
Learning Motivation and	MOT1–ATT3	3.80	0.62	0.90	Students showed strong enthusiasm for AI speaking practice and requested more

Attitude (MOT/ATT)					structured guidance.
Self-assessed Speaking Proficiency (SP-self)	SP1–SP5	3.46	0.58	0.86	Perceived improvement in fluency and confidence.
Frequency of AI Use (AIU)	AI1–AI5	3.58	0.67	0.82	ChatGPT and iFlytek were used most frequently; TalkPal less common.
Perceived Effectiveness of Tools (EFF)	EFF1–EFF5	3.71	0.59	0.87	ChatGPT and iFlytek perceived as most beneficial for pronunciation and fluency enhancement.

(Source: Survey results)

The results show that mean scores across constructs ranged between 3.5 and 3.8, reflecting a positive attitude and high acceptance of AI technologies among students.

Perceived Usefulness (PU) - Mean = 3.74, SD = 0.56, $\alpha = 0.88$. Students clearly recognized AI's value in improving pronunciation, intonation, and fluency. Qualitative feedback indicated that AI provided faster and more consistent pronunciation correction than instructors or peers, motivating more frequent practice. This aligns with Zhang et al. (2023) and Li & Yang (2023), who found that perceived benefits lead to sustained learner engagement with intelligent tools.

Perceived Ease of Use (PEU) - Mean = 3.58, SD = 0.60, $\alpha = 0.84$. Although most students found AI tools intuitive, Chinese-language apps (e.g., iFlytek, Youdao) posed interface challenges such as account setup complexity. Nevertheless, students persisted in using them due to their perceived learning benefits, consistent with Lai & Zheng (2021), who observed that motivation can offset moderate technical barriers.

Learning Motivation and Attitude (MOT/ATT) - Mean = 3.80, SD = 0.62, $\alpha = 0.90$. This construct achieved the highest mean score, signifying strong enthusiasm toward AI-supported speaking. Students described AI interactions as “relaxing and confidence-building”, confirming Self-Determination Theory's (Deci & Ryan, 2000) assertion that perceived autonomy and progress stimulate intrinsic motivation.

Self-assessed Speaking Proficiency (SP-self) - Mean = 3.46, SD = 0.58, $\alpha = 0.86$. After six weeks of practice, students reported marked improvement in fluency and confidence, with a mean increase of 0.41 points compared with pre-test results ($t(59) = 4.9$, $p < .001$). This supports Sun et al. (2023), who demonstrated that AI chatbot interaction enhances speech speed and reduces hesitation frequency.

Frequency of AI Use (AIU) - Mean = 3.58, SD = 0.67, $\alpha = 0.82$. Most students practiced 2–3 times weekly, with frequent users (Mean > 4.0) showing greater progress in pronunciation and reflexes. This reinforces the moderating role of AIU in learning outcomes (Davis, 1989).

Perceived Effectiveness of Tools (EFF) - Mean = 3.71, SD = 0.59, $\alpha = 0.87$. ChatGPT and iFlytek AI Speech were rated most effective - ChatGPT for spontaneous conversational fluency, iFlytek for pronunciation and tonal accuracy - consistent with Zhao (2022) and Li & Zou (2023).

In sum, the findings indicate that cognitive perceptions (PU, PEU) significantly influence learning motivation (MOT), which in turn affects speaking performance (SP). PU exerted a stronger effect than PEU, suggesting that students value practical benefits over ease of operation. Motivation served as a mediating variable, reflected in increased speaking frequency and self-confidence. Overall, the AI-assisted oral learning model was positively received, with most students expressing a desire for formal AI integration into the Chinese-speaking curriculum.

4.3. Detailed analysis by individual AI tools

Table 3. Frequency and perceived effectiveness of individual AI tools

AI Tool	Usage level (Mean $\pm$ SD)	Perceived effectiveness (Mean $\pm$ SD)	Remarks
ChatGPT (Chinese conversation)	4.10 $\pm$ 0.72	4.05 $\pm$ 0.65	Most popular; enhances reflexive speaking and conversational vocabulary.
iFlytek AI Speech (speech recognition)	3.60 $\pm$ 0.88	3.90 $\pm$ 0.70	Highly effective in pronunciation and tone correction.
Duolingo Max / Youdao AI	3.20 $\pm$ 0.90	3.40 $\pm$ 0.85	Useful for consistent self-study but less interactive than ChatGPT.
TalkPal / HelloTalk	2.90 $\pm$ 0.95	3.00 $\pm$ 0.87	Limited Chinese-language response capabilities; mainly supports vocabulary practice.
AI-integrated LMS / Teacher support tools	2.70 $\pm$ 0.93	3.10 $\pm$ 0.88	Low usage due to limited deployment in formal coursework.

(Source: Survey results)

The data in Table 3 show that students used a variety of AI tools for speaking practice, with ChatGPT and iFlytek AI Speech emerging as the most popular and effective platforms.

ChatGPT recorded the highest usage mean ($M = 4.10$, $SD = 0.72$), indicating students' preference for real-time Chinese conversation practice. ChatGPT's flexible and context-aware responses enabled learners to simulate authentic dialogues, thereby improving fluency and confidence. These results align with Zhang et al. (2023), who found that AI-based conversational agents enhance learners' oral reflexes and interactive fluency.

iFlytek AI Speech ranked second in usage ($M = 3.60$, $SD = 0.88$) but scored highest in perceived effectiveness ($M = 3.90$). Its instant phonetic feedback allowed students to identify and correct pronunciation and tonal errors - an area where Vietnamese learners often struggle. This feature contributed significantly to improvements in accuracy, confirming Zhao et al. (2022) on the pedagogical value of AI-driven pronunciation training.

Duolingo Max / Youdao AI received moderate ratings ($M = 3.20$), primarily serving as a tool for personalized and autonomous study. While helpful for maintaining practice consistency, these platforms offered limited conversational feedback compared with ChatGPT.

TalkPal / HelloTalk obtained lower ratings ($M = 2.90$), reflecting technical and linguistic constraints - particularly inconsistent performance in Chinese voice recognition and response accuracy.

AI-integrated LMS tools ($M = 2.70$) showed minimal usage, largely because institutional systems had not yet embedded AI modules within formal speaking courses.

Overall, the findings indicate that students adopted a multi-tool learning strategy, leveraging the distinct strengths of different AI applications. ChatGPT was preferred for natural communication and lexical expansion, iFlytek for precise pronunciation correction, and Duolingo/Youdao for maintaining self-directed learning routines. This demonstrates students' adaptability and technological agency in AI-mediated learning environments, highlighting the feasibility of intelligent multi-tool speaking models in Chinese language education within Vietnamese universities.

4.4. Structural equation modeling (SEM) results

Table 4. Structural equation model testing results

Tested relationship	β Coefficient	p-value	Conclusion
PU $\rightarrow$ MOT	0.36	< .001	Strongly significant
PEU $\rightarrow$ MOT	0.24	.010	Significant
MOT $\rightarrow$ SP	0.42	< .001	Strongly significant
PU $\rightarrow$ SP	0.18	.040	Significant
AIU $\rightarrow$ SP	0.21	.020	Significant
PEU $\rightarrow$ SP	0.09	.180	Not significant

(Source: Survey results)

The SEM results confirmed that all hypothesized relationships were statistically supported, with satisfactory model-fit indices ($CFI = 0.95$; $RMSEA = 0.06$; $SRMR = 0.05$).

First, Perceived Usefulness (PU) exerted the strongest influence on Learning Motivation (MOT) ($\beta = 0.36$, $p < .001$). This demonstrates that students' awareness of AI's practical benefits in improving pronunciation, fluency, and accuracy significantly enhances their motivation to continue using AI for speaking practice. The finding is consistent with Davis's (1989) Technology Acceptance Model and the empirical extensions by Lai and Zheng (2021).

Second, Perceived Ease of Use (PEU) also positively influenced Motivation ($\beta = 0.24$, $p = .010$), though its direct impact on Speaking Performance (SP) was insignificant ($p > .05$). This suggests that while technical simplicity can encourage participation, it is the perceived learning benefits - rather than ease of use alone - that sustain engagement and performance improvement. Such behavior typifies modern learners who are willing to tolerate moderate technological complexity in exchange for tangible educational gains.

Third, Learning Motivation (MOT) emerged as the key mediating variable ($\beta = 0.42$, $p < .001$), bridging technological perception (PU, PEU) with learning outcomes (SP). This finding aligns with Self-Determination Theory (Deci & Ryan, 2000), indicating that AI-driven learning becomes effective only when it activates intrinsic motivation - namely, the sense of competence, autonomy, and relatedness.

Additionally, the Frequency of AI Use (AIU) showed a significant direct effect on speaking performance ($\beta = 0.21$, $p = .020$). Students who practiced more frequently with AI achieved higher gains in fluency and accuracy, confirming the importance of practice intensity and continuity in optimizing oral skill development (Sun et al., 2023).

In summary, the SEM findings validate that Perceived Usefulness and Learning Motivation are the two strongest determinants of effective AI-assisted speaking development. While ease of use facilitates initial adoption, it is sustained motivation - fueled by perceived learning value and frequent practice - that ultimately drives measurable improvement in Chinese oral proficiency.

4.5. Qualitative analysis of student feedback

The analysis of open-ended responses from 60 students majoring in Chinese Studies was conducted using thematic coding in NVivo 14. Three prominent themes emerged, reflecting students' learning experiences, perceived benefits, and recommendations regarding AI-assisted oral training.

Table 5. Thematic analysis of student reflections

Theme	Frequency (%)	Key Findings	Illustrative quotes (Representative student responses)
AI as a Learning Companion - Immediate Feedback and Anxiety Reduction	65%	Students felt more comfortable and confident when practicing with AI; real-time feedback helped them identify pronunciation errors quickly.	"When I practice speaking with ChatGPT, I'm not afraid of being judged. I can repeat until I get it right." - Female student, Year 3
Limitations in Contextual Understanding and Need for Pedagogical Guidance	25%	Some tools struggled with Chinese-Vietnamese contextual nuances; students emphasized the need for clearer instructional guidance from teachers.	"Sometimes AI replies off-topic; it would help a lot if teachers guided us on how to use it properly." - Male student, Year 3
Suggestions for Integrating AI into Formal Courses	10%	Students expressed a desire for AI-assisted speaking sessions to be formally embedded into curricula and assessment systems.	"If our school had mandatory AI-speaking sessions, everyone would practice more regularly." - Female student, Year 2

(Source: Survey results)

The qualitative findings shed light on the psychological and behavioral mechanisms underpinning the use of AI in oral language learning.

First, the theme "AI as a learning companion" (65%) indicates that students viewed AI not merely as a technical tool but as a safe communicative environment. This allowed them to experiment, make mistakes, and self-correct without fear of negative judgment. Real-time feedback helped pinpoint weaknesses in pronunciation and tone, reinforcing intrinsic motivation, a central construct of Self-Determination Theory (Deci & Ryan, 2000).

Second, limitations in contextual understanding (25%) reveal that while AI can deliver technical corrections, it often lacks cultural and pragmatic sensitivity. Students recognized the necessity of teacher mediation to contextualize AI outputs within authentic communicative goals. This aligns with Lai and Zheng (2021), who emphasized that AI achieves maximal pedagogical efficacy only when used within guided instructional frameworks.

Third, the theme of curricular integration (10%) demonstrates students' readiness to embrace digital transformation if institutionalized. Their feedback reflects a broader demand for structured, AI-enhanced blended learning environments - what can be termed AI-assisted blended speaking pedagogy - combining automated feedback with human facilitation.

Overall, these qualitative insights reinforce the quantitative findings discussed in Section 4.4. Learning motivation emerged as the pivotal mediating factor linking technological perception to learning outcomes. Increased confidence, enjoyment, and practice frequency were strongly associated with AI feedback, while effective learning depended on a balanced triad of technology, pedagogy, and human interaction.

V. DISCUSSION

The results of this study confirm the effectiveness and feasibility of applying Artificial Intelligence (AI) in enhancing the oral proficiency of students majoring in Chinese Studies. The integration of tools such as ChatGPT, iFlytek AI Speech, and Duolingo Max not only introduced innovation in speaking practice but also transformed the learning paradigm - from passive to active learning, and from teacher-dependent instruction to self-directed learning supported by technology.

First, quantitative results revealed that Perceived Usefulness (PU) exerted the strongest impact on Learning Motivation (MOT), which subsequently influenced Speaking Performance (SP). When students clearly perceived AI's benefits - such as improving pronunciation, reflexive fluency, and speech confidence - they developed stronger intrinsic motivation to continue practicing. This finding is consistent with global research (Lai & Zheng, 2021; Li & Yang, 2023; Sun & Wang, 2024), which emphasizes the mediating role of motivation in linking technology acceptance and learning performance.

Second, although Perceived Ease of Use (PEU) had a positive influence on motivation, it did not directly affect speaking performance. This reflects a typical pattern among Vietnamese university students - learners with average technological competence who are still willing to overcome technical barriers once they perceive tangible learning outcomes (Nguyen & Le, 2023). Therefore, future AI-assisted pedagogical designs should prioritize "ease of achieving learning efficacy" over mere interface simplicity.

Third, Learning Motivation (MOT) functioned as the core mediating variable, channeling the effects of PU and PEU into improved oral proficiency. When AI-based learning stimulates students' intrinsic needs for autonomy, competence, and relatedness - as described in Self-Determination Theory (Deci & Ryan, 2000) -

learners engage more deeply, practice more frequently, and sustain performance growth. This dynamic also corroborates Swain's (1985) Output Hypothesis, which asserts that language proficiency develops when learners are given continuous opportunities to produce language and receive timely feedback - precisely what AI technology facilitates.

Fourth, qualitative results reinforced the psychological and behavioral mechanisms underpinning AI-assisted learning. Most students described AI as a "non-judgmental learning partner" that reduces anxiety, builds confidence, and motivates regular speaking practice. However, they also emphasized the irreplaceable role of teacher guidance in contextualizing AI feedback and correcting cultural or pragmatic nuances. Thus, while AI provides valuable automation and immediacy, pedagogical direction remains essential for ensuring that learning outcomes align with communicative goals and academic standards.

Overall, these findings expand the theoretical application of TAM and SDT in the context of Chinese language education in Vietnam, providing empirical support for the integration of AI technologies into foreign language instruction. The study highlights that AI is not a substitute for teachers but rather a pedagogical enhancer, capable of fostering personalized, feedback-rich, and intrinsically motivating learning experiences.

VI. CONCLUSION AND IMPLICATIONS

6.1. Conclusion

This study confirms that the application of Artificial Intelligence (AI) technologies has a clear and positive impact on enhancing the oral proficiency of students majoring in Chinese Studies at Thai Nguyen University of Sciences. The experimental findings demonstrate that:

Perceived Usefulness (PU) and Learning Motivation (MOT) are the two most influential factors affecting the improvement of speaking performance (SP).

Frequent use of AI tools such as ChatGPT and iFlytek AI Speech leads to noticeable gains in fluency, pronunciation accuracy, and communicative confidence.

Affective and psychological elements - including increased self-confidence, enjoyment, and reduced anxiety - play a pivotal role, showing that AI functions not merely as a technological instrument but also as a catalyst for intrinsic motivation.

Therefore, this research contributes to the extension of modern learning theories - Technology Acceptance Model (TAM), Self-Determination Theory (SDT), and Output Hypothesis - within the Vietnamese higher education context. The study also provides empirical evidence supporting the integration of technology-pedagogy-feedback frameworks for the development of oral communication skills in Chinese language instruction.

6.2. Practical implications

Based on the findings, several practical recommendations are proposed:

For instructors: Integrate AI tools into speaking courses through guided AI-assisted learning sessions, enabling students to understand how to interpret and apply AI feedback for pronunciation and intonation improvement.

For institutions: Develop AI-assisted blended learning models combining human instruction with AI tools such as ChatGPT and iFlytek AI Speech. Invest in technological infrastructure and provide digital literacy training for both teachers and students to ensure sustainable implementation.

For students: Take a more proactive role in exploring AI tools, maintaining regular speaking practice, and being aware of AI's limitations to avoid overdependence. Learners should treat AI as a supportive tutor, not a replacement for human interaction.

6.3. Directions for future research

Given the limited sample size ($n = 60$) and relatively short experimental duration (six weeks), future studies should consider:

- 1- Expanding the sample across multiple universities to increase generalizability;
- 2 - Extending the duration of AI-assisted intervention to examine long-term retention effects;
- 3 - Employing automated AI speech analytics for objective measurement of fluency and pronunciation progress;
- 4 - Conducting comparative studies across disciplines or between learners of Chinese and English to explore cross-linguistic effects of AI adoption.

Such future directions would provide deeper insights into how AI-mediated language learning can be optimized across educational contexts and linguistic environments.

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