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Application Research on AI Chatbots Assisting Non-English Majors in Improving Oral English

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Abstract: This study investigates the challenges in non-English major oral English instruction at vocational colleges and evaluates the effectiveness of AI chatbots in language education. Conducted at Hubei Preschool Education College, the research involved 100 non-English major students randomly assigned to an experimental group (50 participants) or a control group (50 participants). The experimental group adopted an "AI chatbot + blended learning" approach, while the control group received traditional oral instruction. After 14 weeks of intervention, data were collected through oral proficiency tests, the Foreign Language Classroom Anxiety Scale (FLCAS), and semi-structured interviews. Results demonstrated that the experimental group achieved significantly higher scores in pronunciation accuracy, fluency, and situational adaptability compared to the control group. Additionally, students in the experimental group showed markedly reduced anxiety levels and greater acceptance and satisfaction with AI-assisted learning. The study confirms that AI chatbots effectively address issues such as limited practice opportunities and delayed feedback in vocational oral English teaching, providing empirical evidence and practical pathways for intelligent transformation in vocational English instruction.

Keywords: AI Chatbot; English for Higher Vocational Education; Non-English Majors; Spoken English; Applied Research.

1. Introduction

The core mission of English oral instruction in vocational colleges for non-English majors is to cultivate professional application skills, which directly impacts students cross-border communication competitiveness in future careers. However, current teaching practices face multiple challenges: Large class sizes (often exceeding 50 students) make one-on-one guidance difficult, while students lack sufficient speaking practice opportunities and receive delayed feedback. Many students struggle with weak English foundations, limited vocabulary, improper pronunciation, and pronounced anxiety about speaking, resulting in widespread reluctance to practice. The curriculum predominantly focuses on basic sentence pattern drills, disconnected from vocational-specific scenarios like business communication, customer service, and logistics coordination, creating a "learning-dissemination gap." [5] With advancements in AI technology, real-time interactive chatbots offering personalized feedback and round-the-clock availability present new solutions [2]. Although existing research confirms the auxiliary value of AI chatbots in language teaching, most studies focus on undergraduate or secondary education. There remains a lack of evidence-based exploration tailored to vocational educations "career-oriented, skill-focused" approach, particularly regarding how AI chatbots can adapt to vocational scenarios and alleviate students speaking anxiety. To address this, this study employs a quasi-experimental design, selecting information security technology applications and health-related courses at Hubei Preschool Education College. A study involving 100 management students was conducted. The experimental group adopted a blended learning approach [9] with AI chatbots designed for workplace scenarios, while the control group maintained traditional teaching methods. Through a 1 4-week intervention program incorporating oral proficiency assessments, anxiety scale evaluations, and semi-structured interviews, this study systematically examined the practical effects of AI chatbots on enhancing students' oral communication skills and reducing anxiety. The findings provide theoretical support and actionable strategies for reforming English oral teaching in vocational colleges. [10]

2. Research Design

2.1. Research Subjects

This study involved 100 non-English majors from two regular classes of Hubei Preschool Education Colleges 2024 cohort. Participants were randomly divided into an experimental group (50 students) and a control group (50 students). The experimental group comprised 23 males and 27 females, including 29 Information Security Technology Application majors and 21 Health Management majors, all aged 18-20. The control group included 22 males and 28 females, with 28 Information Security Technology Application majors and 22 Health Management majors, also aged 18-20. A standardized PRETCO (Pre-English Test for College Students) oral test was administered as a pre-intervention assessment. No significant statistical differences were observed in oral test scores between the groups ($t=0.287$, $p>0.05$), confirming the homogeneity required for group intervention [4]. All participants demonstrated basic smartphone and computer operation skills but had no prior experience with AI chatbot practice, ensuring controlled experimental variables.

2.2. Research Tools

2.2.1. AI Chatbot Selection

DeepSeek-R1 is selected as the experimental tool, with its core functions adapting to the teaching needs of higher vocational education: first, it covers high-frequency vocational scenarios for higher vocational students, including business negotiations, customer consulting, job interviews, etc.; second, it supports real-time voice interaction, which can

accurately identify pronunciation deviations and grammatical errors, and immediately provide correction suggestions and standard example sentences [8]; third, it has an adaptive difficulty adjustment function, which can dynamically adjust the conversation difficulty according to students' expression fluency and vocabulary complexity, maintaining effective practice within the "zone of proximal development"; fourth, it automatically records practice data, including practice duration, error types, weak points in high-frequency expressions, etc., providing data support for teachers' precise teaching. [1]

2.2.2. Evaluation Tools

Oral proficiency assessment: Both pretest and posttest utilized the PRETCO standardized oral test format, comprising three components: situational dialogues, picture descriptions, and thematic discussions. Two vocational college English instructors with over 10 years of teaching experience conducted double-blind scoring across four dimensions: pronunciation accuracy (25 points), fluency of expression (25 points), lexical and grammatical application (25 points), and situational appropriateness (25 points), all scored on a 100-point scale. The consistency coefficient of scoring reached 0.91, ensuring reliable evaluation.

Foreign Language Classroom Anxiety Scale (FLCAS): Foreign Language Classroom Anxiety Scale (FLCAS): This study adopted the classic scale developed by Horwitz et al., which comprises 33 items and employs a 5-point Likert scoring system (1 = Strongly Disagree, 5 = Strongly Agree). The total score ranges from 33 to 165, with higher scores indicating a higher level of oral English anxiety. In the present study, the Cronbach's α coefficient of the scale was 0.88, confirming good internal consistency. [6]

Semi-structured Interviews: After the intervention, 20 students were randomly selected from the experimental group for interviews. The interview outline focused on three core dimensions, namely the experience of using AI tools, the perception of oral English proficiency improvement, and existing problems and improvement suggestions, with 8 key questions designed to ensure the pertinence and completeness of qualitative data.

2.3. Research Process

The experiment lasted 14 weeks, with two sessions per week. The specific procedure was as follows:

Pre-intervention preparation (Week 1):

Administer pretest of oral proficiency and FLCAS scale to both groups to establish baseline data. The experimental group will receive AI chatbot operation training covering core functions including scenario switching, voice interaction, and feedback review, with a mandatory requirement of 30 minutes of weekly self-practice after class. [2]

Teaching intervention phase (Weeks 2-13):

The experimental group adopted an "AI + blended learning" model: Before class, teachers assigned workplace scenario tasks (e.g., "simulated e-commerce customer return/exchange consultation"). Students completed pre-practice using AI chatbots, with real-time feedback on their expressions [1]. During class, teachers analyzed AI practice data to address common errors (e.g., tense confusion, non-standard workplace expressions), organized group role-playing activities, and guided students to apply AI-learned norms in real interactions. After class, AI chatbots delivered personalized reinforcement tasks based on student performance (e.g., targeted training for frequent errors, scenario-based expression expansion exercises).

The control group adopted the traditional teaching model: before class, students were assigned to read texts aloud and memorize vocabulary; during class, the teacher mainly explained core sentence patterns, organized group recitation, and conducted two-person dialogue practice, with random spot checks and on-the-spot comments [9]; after class, students were required to submit oral recordings on designated topics, and the teacher provided focused feedback on common issues in the next class. [4]

The Post-intervention Assessment (Week 14):

Both groups of students will take a post-test on oral proficiency, and the FLCAS (Foreign Language Classroom Anxiety Scale) will be administered simultaneously to collect quantitative data. Semi-structured interviews will be conducted with 20 students from the experimental group to record qualitative data. Finally, all data will be collated for statistical analysis and result validation. [3]

3. Research Results and Analysis

3.1. Results of the Oral Language Proficiency Test

Table 1. Oral Test Performance Comparison Between Groups (±s)

group	number of people	Test type	Spelling accuracy	expressive fluency	lexical grammar application	Scene adaptability	total points
experimental group	50	Pre-test	16.3±2.2	15.7±2.4	16.4±2.0	14.2±2.6	62.6±7.0
		Post-test	21.8±1.7	22.5±2.0	20.9±1.8	20.3±2.1	85.5±6.3
		D-value	5.5±1.4	6.8±1.6	4.5±1.2	6.1±1.5	22.9±4.9
control group	50	Pre-test	16.4±2.1	15.8±2.3	16.5±2.1	14.3±2.5	63.0±6.9
		Post-test	18.5±1.9	18.3±2.1	18.4±1.9	16.6±2.2	71.8±7.1
		D-value	2.1±1.1	2.6±1.3	1.9±1.0	2.3±1.3	8.9±4.6

Statistical analysis revealed no significant differences in pre-test scores across all dimensions or the total score between the two groups ($p>0.05$). In post-tests, however, the experimental group demonstrated significantly higher scores in all dimensions and the total score, with a 22.9-point gap between pre-and post-tests—far exceeding the 8.9-point gap in the control group. The independent samples t-test confirmed statistically significant differences in post-test total scores ($t=10.36$, $p<0.001$), particularly in the dimensions of fluency and situational adaptability [8]. These results highlight the unique advantages of AI chatbots in high-frequency interactions and workplace scenario simulations.

3.2. Changes in the Level of Oral Anxiety

Table 2. Pre-and post-test scores of the FLCAS scale in two student groups (±s)

group	number of people	Pre-test score	Post-test score	D-value	t price	p price
experimental group	50	112.5±10.3	82.1±9.6	-30.4±8.4	22.79	<0.001
control group	50	112.1±10.1	105.7±9.9	-6.4±7.8	5.31	<0.05

As shown in Table 2, there was no significant difference in oral anxiety levels between the two groups before intervention ($p>0.05$). After intervention, both groups showed a decrease in anxiety scores, but the experimental groups reduction (30.4 points) was significantly greater than that of the control group (6.4 points). Moreover, the experimental groups post-test score (82.1 points) fell within the low-anxiety range. The independent samples t-test revealed statistically significant differences between the groups ($p<0.001$), indicating that the low-stress interactive environment provided by the AI chatbot effectively alleviates students' anxiety in oral expression. [6]

3.3. Results of Semi-structured Interviews

Qualitative analysis revealed that students in the experimental group showed strong acceptance of AI-assisted teaching. 88% identified "always available and free from evaluation pressure" as a key advantage, effectively addressing the anxiety of speaking in traditional classrooms. 76% noted that workplace scenario dialogues directly aligned with professional learning needs, significantly enhancing the relevance of oral practice. 63% reported that AIs real-time feedback helped them quickly correct pronunciation and grammar errors, proving more efficient than traditional teacher-led feedback. Students also proposed improvements, including expanding the industry-specific vocabulary database, refining feedback accuracy for complex sentence structures, and enhancing the immersive quality of dialogue scenarios.

4. The Effectiveness Mechanism, Emotional Value and Optimization Path of AI Chatbot Empowering Oral English Teaching in Higher Vocational Education

4.1. Mechanism of AI Chatbot to Improve Oral Ability

4.1.1. High-frequency Interaction Bridges Practice Gaps

AI chatbots transcend time and space constraints, offering students round-the-clock, low-pressure oral practice. Experimental group students averaged 48 minutes of self-directed practice weekly, significantly exceeding the recorded practice time of the control group. This frequent language output fosters a closed-loop learning cycle of input-internalization-output, aligning with the interaction hypothesis that meaningful interaction is central to language acquisition. [7]

4.1.2. Personalized Feedback Refines Practice Precision

The tools real-time error correction for pronunciation and grammar helps students quickly identify weaknesses and prevent errors from becoming ingrained. Its adaptive difficulty adjustment keeps practice within an achievable range—just a step away from success—maintaining learning motivation while ensuring progressive skill development, aligning with the principle of differentiated instruction. [10]

4.1.3. Strengthening Application-Oriented Learning in Workplace Scenarios

The vocational college-specific workplace scenarios built into AI chatbots achieve precise alignment between oral English teaching and professional needs. The expressive skills students acquire through simulating real workplace communication can be directly transferred to future work, effectively addressing the "disconnection between learning and application" in traditional teaching and highlighting the vocational nature of higher vocational education. [9]

4.2. The Effect of AI Chatbot on Oral Anxiety and Emotional Empowerment

In traditional classrooms, vocational college students majoring in non-English disciplines often develop avoidance behaviors due to weak foundational skills and fear of being judged for expression errors, creating a vicious cycle of "anxiety-avoidance-cognitive stagnation." AI chatbots, with their anonymity and non-judgmental environment, completely break down this barrier: students are free from interpersonal evaluation pressure, receive no negative feedback for expression errors, and face significantly lower barriers to speaking, encouraging bold experimentation. Additionally, the built-in positive reinforcement mechanism enhances students self-efficacy and builds confidence in expression, fostering a virtuous cycle of "active practice-cognitive improvement-anxiety reduction," aligning with Krashen's affective filter hypothesis that "low affective filter facilitates language acquisition." [7] This anxiety reduction not only boosts participation in practice but also helps students focus on language content rather than emotional distress, accelerating the learning process.

4.3. Limitations of the Research and Future Optimization Direction

This study has two limitations: First, the 14-week experimental period only focused on short-term effects, failing to track long-term impacts of tool application. Issues such as whether students maintained practice habits after intervention cessation or if their abilities declined require

further verification [8]. Second, the study exclusively used a single type of AI tool, without comparing teaching effectiveness differences among tools with varying technical architectures and functional focuses, nor exploring their compatibility with different teaching methods.

Future improvements can be optimized through three key approaches: First, extending the experimental period to one semester or longer to conduct longitudinal tracking studies on long-term impacts and the formation of practice habits [3]. Second, expanding the sample scope to include students from diverse majors and academic backgrounds to validate the teaching models universality, while designing multi-group comparative experiments to explore differences in AI tool applications. Third, deepening the integration of tools with teaching needs by incorporating industry-specific vocabulary libraries based on student suggestions, optimizing feedback on complex sentence structures, introducing VR immersive scenarios, and exploring a "AI-assisted + teacher-led" collaborative model. This approach combines technological empowerment with humanistic education, driving the intelligent, precise, and professional development of vocational English speaking instruction.

5. Conclusion

The 14-week quasi-experimental study demonstrates that an AI-assisted blended teaching model significantly enhances English speaking proficiency among vocational college students in non-English majors. The program achieved breakthrough improvements across four key dimensions: pronunciation accuracy, fluency, vocabulary-grammar application, and situational adaptability. It effectively alleviated students' anxiety about oral expression while earning high student approval. By leveraging three core strengths—frequent interaction, personalized feedback, and workplace scenario adaptation—the model precisely addresses traditional pain points in vocational English teaching, including insufficient practice opportunities, delayed feedback, and disconnection between learning and application. This provides a viable pathway for intelligent and vocational-oriented reforms in English education. Future vocational English instruction should actively integrate AI chatbots to establish a new teaching model combining "AI assistance + teacher-led guidance + workplace orientation", while emphasizing the deep integration of tool functionalities with educational needs to achieve quality-enhanced teaching through technological empowerment.

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