Practice and Exploration of Applying Artificial Intelligence to Spoken English Teaching for Undergraduate Students in Minzu Colleges and Universities

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Abstract. Under the backdrop of educational digital transformation, Artificial Intelligence (AI) technology offers a new pathway for the reform and innovation of spoken English teaching for undergraduate students in ethnic colleges and universities. This teaching faces unique challenges such as significant disparities in students' language proficiency, a lack of authentic language practice scenarios, and insufficient cultivation of cross-cultural communication skills. Based on constructivist learning theory and the theory of multiple intelligences, and considering the characteristics of ethnic colleges and universities and their students, this paper explores the application value and practical approaches of AI technology in spoken English teaching for undergraduates in these institutions. By analyzing the functional advantages of AI-powered spoken English teaching platforms, a teaching model integrating "technology empowerment + cultural immersion + personalized guidance" is designed. A practical teaching study is conducted using a specific ethnic college as a case study to verify the effectiveness of this model in enhancing students' English oral expression ability, cross-cultural communication literacy, and learning initiative. Finally, optimization strategies are proposed to address issues encountered during practice, such as technology adaptability, teaching resource development, and improvement of teacher competency, providing theoretical reference and practical insights for the deep integration of AI technology with undergraduate spoken English teaching in ethnic colleges and universities.

Keywords: Artificial Intelligence; Minzu Colleges and Universities; Undergraduate College English; Spoken English Teaching; Practical Exploration

1 Introduction

With the acceleration of globalization and the deepening advancement of the "Belt and Road" Initiative, the societal demand for interdisciplinary talents equipped with cross-cultural communication skills has become increasingly urgent, highlighting the importance of college English spoken language teaching. As crucial bases for cultivating

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minority talents and promoting development in ethnic regions, undergraduate English spoken language teaching in ethnic colleges and universities not only undertakes the task of language skill cultivation but also shoulders the mission of inheriting ethnic culture, enhancing interethnic exchange, and fostering patriotism. However, influenced by factors such as geographical environment, student demographics, and teaching resources, spoken English teaching for undergraduates in these institutions has long faced numerous difficulties.

Concurrently, AI technologies centered on big data, cloud computing, natural language processing, and speech recognition & synthesis are rapidly developing, profoundly reshaping the forms and models of education and teaching. The Education Informatization 2.0 Action Plan explicitly calls for promoting the deep integration of AI and education to build an intelligent education system. Riding this wave, introducing AI technology into undergraduate spoken English teaching in ethnic colleges and universities holds the potential to overcome the limitations of traditional teaching models, compensate for insufficient teaching resources, and create personalized, immersive language learning environments for students, thereby enhancing the quality and effectiveness of spoken English teaching[1]. Therefore, exploring the practical application of AI technology in this context possesses significant practical relevance and contemporary value.

1.1 Research Significance

1.1.1 Theoretical Significance.

Theoretical Significance: This research enriches the theoretical framework of AI applications in education by combining AI technology with the specific educational context of Minzu colleges and universities, expanding the application boundaries of constructivist learning theory and the theory of multiple intelligences in ethnic education. By analyzing the integration mechanism between AI technology and undergraduate English spoken language teaching in these institutions, it provides a new theoretical perspective for foreign language teaching reform in ethnic colleges and universities and lays a foundation for subsequent research in related fields.

1.1.2 Practical Significance.

Addressing the actual problems in undergraduate English spoken language teaching in ethnic colleges and universities, this study constructs an AI-based spoken language teaching model and conducts practical verification, offering specific teaching reference plans for front-line English teachers in these institutions. It helps enhance the English oral expression ability and cross-cultural communication literacy of students in ethnic colleges and universities, strengthening their employability and social adaptability. Simultaneously, it contributes to promoting the informatization of education in ethnic colleges and universities, facilitating the balanced allocation of high-quality educational resources, and supporting the development of education in ethnic regions.

1.1.3 Current Research Status at Home and Abroad.

International Research Status: Research on the integration of AI and English spoken language teaching started earlier abroad, with relatively mature related technologies and applications. Since the 1990s, international scholars have explored Computer-Assisted Language Learning (CALL) in spoken language teaching. With the development of AI technology, research has gradually focused on the application of core technologies such as intelligent speech recognition and adaptive learning systems. For example, scholars have utilized speech recognition technology to develop oral assessment systems capable of real-time precise evaluation of students' pronunciation, intonation, grammar, etc., and providing personalized feedback. Adaptive learning systems adjust teaching content and difficulty automatically based on students' learning progress and ability levels, achieving personalized instruction. Furthermore, international research emphasizes integrating technologies like Virtual Reality (VR) and Augmented Reality (AR) into spoken language teaching to create immersive language practice scenarios and enhance students' language application ability. Overall, international research has accumulated rich experience in technology development and teaching model innovation, but studies targeting specific educational contexts like ethnic colleges and universities are relatively scarce.

Domestic Research Status: Domestic research on the integration of AI and college English spoken language teaching has developed rapidly in recent years. Numerous scholars have conducted research on the application of intelligent spoken language teaching platforms, teaching model reform, and teaching effectiveness evaluation. For instance, some scholars, through empirical studies, have verified the effectiveness of intelligent spoken language platforms in improving students' pronunciation accuracy and oral fluency. Others have constructed AI-based "online + offline" blended spoken language teaching models, exploring their implementation paths and advantages[2].

Regarding research on ethnic colleges and universities, domestic scholars primarily focus on spoken language teaching issues under traditional models, such as students' weak language foundation, scarcity of teaching resources, and insufficient cultivation of cross-cultural communication skills, proposing corresponding teaching reform suggestions. However, research combining AI technology with undergraduate English spoken language teaching in ethnic colleges and universities is still in its infancy. Existing studies are mostly theoretical discussions, lacking systematic practical research and in-depth effectiveness analysis, and fail to fully incorporate the distinctive characteristics of ethnic colleges and the cultural backgrounds of their students. Therefore, this study aims to fill this research gap and provide practical support for the intelligent reform of undergraduate English spoken language teaching in ethnic colleges and universities.

1.1.4 Research Framework and Methods.

Research Framework: This paper first reviews relevant domestic and international research to clarify the application status and development trends of AI technology in English spoken language teaching. Secondly, it analyzes the current situation and challenges of undergraduate English spoken language teaching in ethnic colleges and universities, discussing the application value of AI technology therein, considering the characteristics of these institutions and their students. Thirdly, based on relevant

educational theories, it constructs an AI-based teaching model for undergraduate English spoken language in ethnic colleges and universities and designs specific teaching implementation plans. Then, taking a specific ethnic college as a case study, it conducts practical teaching research, collecting data through questionnaires, interviews, and performance analysis to verify the model's effectiveness[3]. Finally, it summarizes problems encountered during practice and proposes corresponding optimization strategies.

Research Methods: (1) Literature Review: Systematically reviewing domestic and international literature in related fields such as AI applications in education and spoken English teaching in Minzu colleges and universities to establish the theoretical foundation for this study. (2) Survey Research: Using questionnaires and interviews to understand the current status and needs of undergraduate students' English spoken language learning and teachers' teaching situations in ethnic colleges and universities, providing a realistic basis for constructing the teaching model. (3) Experimental Research: Selecting two undergraduate classes from an ethnic college as experimental subjects, applying the traditional spoken language teaching model and the AI-based model respectively. Comparative analysis of indicators like academic performance and learning initiative between the two groups verifies the effectiveness of the new teaching model. (4) Case Analysis: Taking the AI-based spoken language teaching practice of a specific Minzu college as a case study to deeply analyze the implementation process, effectiveness, and existing problems of the teaching model, providing practical support for proposing optimization strategies.

2 Relevant Theoretical Foundations

2.1 Constructivist Learning Theory

Constructivist learning theory posits that knowledge is not acquired through teacher transmission but is actively constructed by learners within certain contexts through collaboration, communication, and the use of necessary learning resources. This theory emphasizes the learner's central role, viewing learning as an active, personalized process, with context, collaboration, conversation, and meaning construction as its four core elements.

In undergraduate English spoken language teaching in ethnic colleges and universities, constructivist learning theory provides important guidance for the application of AI technology. AI technology can construct rich, immersive language learning contexts, such as simulating real-life scenarios like business negotiations and cross-cultural exchanges, encouraging students to actively engage in language practice within these contexts. Simultaneously, intelligent learning platforms can provide students with personalized learning resources and pathways, supporting their autonomous choice of content and pace[4]. Furthermore, the collaborative learning functions of such platforms can promote interaction and communication among students and between teachers and students, aiding learners in constructing language knowledge and improving oral skills through collaboration.

2.2 Theory of Multiple Intelligences

Proposed by American psychologist Howard Gardner, the theory of multiple intelligences suggests that human intelligence is not singular but consists of multiple intelligences including linguistic, logical-mathematical, spatial, bodily-kinesthetic, musical, interpersonal, intrapersonal, and naturalist intelligences. Each individual has a unique combination and developmental level of these intelligences. Therefore, education should pay attention to individual differences, employ diverse teaching methods, and promote students' holistic development.

Students in ethnic colleges and universities come from various ethnic groups with different cultural backgrounds and intellectual characteristics. The theory of multiple intelligences requires that English spoken language teaching in these institutions fully respects individual differences and teaches students according to their aptitude. AI technology can accurately capture student learning data, analyze their intellectual characteristics and learning needs, and provide personalized spoken language learning plans for different students. For example, for students with strong linguistic intelligence, more challenging oral expression tasks can be provided; for those with strong interpersonal intelligence, group collaborative oral practice activities can be designed more frequently, thereby leveraging each student's strengths and enhancing the pertinence and effectiveness of spoken language teaching.

2.3 Second Language Acquisition Theory

Second Language Acquisition (SLA) theory holds that language learning is a complex psychological process requiring substantial comprehensible input and meaningful language output. Comprehensible input refers to language materials learners can understand, forming the foundation for language acquisition. Meaningful output involves learners using the target language for authentic communication and expression, which is key to enhancing language proficiency. Additionally, language learning requires a relaxed, pleasant environment to reduce learners' affective filters and facilitate language acquisition.

AI technology can provide abundant comprehensible input resources for undergraduate students' English spoken language learning in ethnic colleges and universities, such as vast amounts of English film clips, audiobooks, and authentic dialogue materials, and can deliver precise recommendations based on students' language proficiency levels. Simultaneously, intelligent speech interaction systems can offer immediate feedback on students' language output, helping them correct errors promptly and improve the accuracy of their expression. Furthermore, AI-constructed virtual learning environments can reduce student anxiety, allowing them to practice speaking boldly in a relaxed atmosphere, lowering the impact of the affective filter on language acquisition, thereby promoting the rapid enhancement of students' English speaking ability.

3 Current Situation and Challenges of Undergraduate English Spoken Language Teaching in Minzu Colleges and Universities

3.1 Current Situation

Minzu colleges and universities, with their core mission of cultivating minority talents, design their undergraduate College English curriculum following national unified syllabus requirements while considering the development needs of ethnic regions. Regarding English spoken language teaching, most ethnic colleges and universities employ the class-based teaching system, with teacher-centered traditional models still dominating. Teaching content primarily revolves around textbooks, focusing on explaining grammar, vocabulary, and other foundational knowledge, with insufficient emphasis on cultivating students' oral expression ability. Teaching methods are relatively monotonous, mainly consisting of teacher demonstration, student repetition, and group discussions, lacking innovation and interest. In terms of teaching resources, although some ethnic colleges have introduced English learning software and online resources, their utilization efficiency is low, failing to fully leverage their role in spoken language teaching[5].

From the student perspective, undergraduate students in ethnic colleges come from various ethnic regions across the country, with significant disparities in language foundation. Some students, having received limited English education resources during primary and secondary school, have a weak English foundation, particularly in oral expression, manifesting as non-standard pronunciation, unnatural intonation, limited vocabulary, and frequent grammatical errors. Moreover, due to a lack of authentic language communication scenarios, students have few opportunities for English oral practice, making it difficult to apply acquired knowledge to actual communication, leading to the prevalence of "dumb English." Additionally, students from different ethnic backgrounds may encounter cultural misunderstandings in cross-cultural communication, affecting the effectiveness of oral interaction.

3.2 Challenges

Significant Disparities in Student Language Proficiency, Difficulty Implementing Personalized Teaching: Students in ethnic colleges come from diverse ethnic regions. Due to varying levels of economic development and educational resource allocation across regions, students' English proficiency is uneven. Some students from economically developed regions or Han Chinese backgrounds may have a better English foundation, while those from remote ethnic minority areas often have a weaker foundation. Under the traditional class-based teaching model, teachers struggle to cater to the learning needs of students at different levels, often resorting to a "one-size-fits-all" approach. This results in advanced students being under-challenged and struggling students falling behind, making effective implementation of personalized teaching difficult and severely impacting the overall effectiveness of spoken language teaching.

Scarcity of Language Practice Scenarios, Insufficient Opportunities for Oral Output: Language learning requires extensive practice. However, most ethnic colleges are

located in ethnic regions with relatively limited external exchanges, leading to a scarcity of authentic English oral communication scenarios for students. In classroom teaching, due to large class sizes, each student receives limited individual speaking practice time. After class, students also find it hard to locate suitable practice partners and environments, resulting in a severe shortage of oral output opportunities[6]. Long-term lack of practice hinders the effective improvement of students' English oral expression ability, preventing the transformation from language knowledge to practical application.

Insufficient Cultivation of Cross-Cultural Communication Skills, Difficulty Adapting to Globalization Needs: Students in ethnic colleges possess unique ethnic cultural backgrounds, requiring them to navigate differences between their native culture, Han Chinese culture, and Western culture in cross-cultural communication. However, current English spoken language teaching in these institutions does not place enough emphasis on cultivating cross-cultural communication skills. Teaching content includes relatively little about Western culture and lacks cross-cultural comparison and exchange materials related to students' own ethnic cultures. In terms of teaching methods, there is also ineffective guidance for students to understand cultural differences and master cross-cultural communication techniques. This leads to issues like cultural conflicts and misunderstandings during cross-cultural oral communication, making it difficult for students to adapt to the demands of cross-cultural communication in a globalized context.

Scarcity and Low Utilization Efficiency of Teaching Resources, Hindering High-Quality Teaching: Compared with regular universities, ethnic colleges and universities often have relatively limited educational funding, leading to scarce resources for English spoken language teaching. Although some institutions have introduced English learning software and online resources, these resources often lack specificity and are not adequately developed considering the characteristics and needs of students in ethnic colleges. Concurrently, due to teachers' insufficient mastery of relevant technologies and a lack of effective teaching guidance, students' utilization efficiency of these resources is low, failing to fully exploit their auxiliary role in spoken language teaching. Furthermore, ethnic colleges often lack specialized English spoken language teaching faculty; most English teachers focus their research on areas like reading and writing, with room for improvement in their spoken language teaching ability and cross-cultural teaching competency[7].

Singular Teaching Evaluation Methods, Inability to Comprehensively Reflect Student Ability: The current evaluation methods for undergraduate English spoken language teaching in ethnic colleges primarily rely on final exams, focusing on assessing students' mastery of foundational knowledge like pronunciation, intonation, and grammar. There is insufficient comprehensive evaluation of students' overall abilities such as oral fluency, logical thinking, and cross-cultural communication skills. This singular evaluation approach cannot fully and objectively reflect students' English oral proficiency, nor can it effectively motivate students to proactively improve their oral expression ability, hindering the enhancement of teaching quality.

4 Application Value of AI in Undergraduate English Spoken Language Teaching in Ethnic Colleges and Universities

4.1 Achieving Personalized Teaching, Accommodating Student Differences

AI technology can precisely capture student learning data through big data analysis, including language foundation, learning progress, habits, and weak points, thereby constructing personalized learning profiles for each student. Based on these profiles, intelligent learning platforms can automatically recommend learning content and practice tasks that match students' ability levels and learning needs. For example, students with a weak foundation can receive basic pronunciation exercises, common vocabulary, and sentence pattern drills; students with a stronger foundation can be assigned more challenging tasks like topic discussions, debates, or cross-cultural communication simulations. Simultaneously, intelligent platforms can adjust learning paths and teaching strategies in real-time based on student feedback, ensuring each student learns at an appropriate pace. This effectively addresses the difficulty of implementing personalized teaching in traditional settings and accommodates the significant language proficiency disparities among students in ethnic colleges.

4.2 Creating Immersive Practice Scenarios, Increasing Oral Output Opportunities

AI technologies such as Virtual Reality (VR), Augmented Reality (AR), and speech interaction can create rich, immersive English oral practice scenarios for students in ethnic colleges. For instance, VR technology can simulate real-life situations like airport pickups, business negotiations, international conferences, and cross-cultural exchanges, allowing students to assume different roles and engage in real-time oral communication within virtual environments. Intelligent speech interaction systems can act as "virtual conversation partners" for one-on-one oral dialogue practice, capable of understanding students' expressive intent in real-time and providing immediate responses and feedback. These immersive practice scenarios break temporal and spatial constraints, providing ample opportunities for oral output. Through repeated practice, students can improve the fluency and accuracy of their oral expression, effectively tackling the scarcity of practice scenarios.

4.3 Strengthening Cross-Cultural Communication Cultivation, Enhancing Cultural Adaptation Ability

AI technology can integrate vast cross-cultural communication resources, providing students in ethnic colleges with rich materials for cross-cultural learning. For example, intelligent learning platforms can recommend knowledge about cultural customs, social etiquette, and language habits from different countries and regions, presented through

various formats like text, images, video, and audio, helping students deeply understand cultural differences. Furthermore, AI can be used to construct simulated cross-cultural communication scenarios where students interact with "virtual characters" from diverse cultural backgrounds, experiencing the cross-cultural communication process and learning skills to handle cultural conflicts and resolve misunderstandings[8]. Additionally, intelligent platforms can incorporate students' own ethnic cultures, designing cross-cultural comparison and exchange tasks, guiding students to respect different cultures while inheriting and promoting their own, thereby enhancing cross-cultural communication skills and cultural confidence.

4.4 Enriching Teaching Resources, Improving Resource Utilization Efficiency

AI technology can integrate and optimize various English spoken language teaching resources, providing robust resource support for teaching in ethnic colleges. Intelligent learning platforms can aggregate vast resources such as English film clips, audiobooks, authentic dialogue materials, and oral practice question banks. Through big data analysis, these resources can be categorized, filtered, and precisely recommended, ensuring their relevance and effectiveness. Moreover, AI technology supports the generation of personalized resources; for example, it can automatically create customized oral practice questions or dialogue scripts based on student learning needs. Additionally, intelligent platforms feature resource management and learning tracking functions, allowing teachers to monitor students' resource usage in real-time and provide timely guidance, thereby improving resource utilization efficiency. The application of AI technology can effectively compensate for the scarcity of teaching resources in ethnic colleges and ensure high-quality spoken language teaching.

4.5 Innovating Teaching Evaluation Methods, Comprehensively Assessing Student Ability

AI technology enables intelligent, diversified, and process-oriented evaluation in English spoken language teaching. Intelligent oral assessment systems can utilize speech recognition and natural language processing technologies to conduct real-time, precise evaluations of students' oral expression. The evaluation dimensions extend beyond foundational knowledge like pronunciation, intonation, and grammar to encompass comprehensive indicators such as oral fluency, logical clarity, vocabulary richness, and cross-cultural communication ability. Simultaneously, intelligent platforms can record students' entire learning process data, including learning time, practice frequency, task completion, and progress, providing a rich basis for formative assessment[9]. Based on this data, teachers can conduct comprehensive and objective evaluations of students' English oral ability, shifting away from the singular summative evaluation of traditional teaching. This approach more accurately reflects students' learning outcomes and ability levels while effectively motivating them to actively participate in oral learning and enhancing their learning initiative.

5 Practical Pathways for Applying AI in Undergraduate English Spoken Language Teaching in Ethnic Colleges and Universities

5.1 Constructing a "Technology Empowerment + Cultural Immersion + Personalized Guidance" Teaching Model

Integrating the distinctive characteristics of ethnic colleges and universities, student profiles, and the advantages of AI technology, a trinity teaching model for English spoken language is constructed: "Technology Empowerment + Cultural Immersion + Personalized Guidance." This model is supported by AI technology, centered on cultural immersion, and guaranteed by personalized guidance, aiming to comprehensively enhance students' English oral expression ability and cross-cultural communication literacy[10].

Technology Empowerment: Relying on AI-powered spoken language teaching platforms, integrating technologies like VR/AR virtual scenarios, intelligent speech interaction, and big data analysis to provide students with immersive language practice environments, personalized learning resources, and precise learning feedback. Through technology empowerment, the temporal and spatial constraints of traditional teaching are broken, students' oral practice opportunities are increased, and teaching efficiency and effectiveness are improved.

Cultural Immersion: Integrating ethnic culture, Han Chinese culture, and Western culture throughout the spoken language teaching process. In teaching content design, select oral materials containing multicultural elements, such as introductions to ethnic cultures and cross-cultural communication cases. In teaching activity design, organize cross-cultural topic discussions, English presentations on ethnic culture, cross-cultural communication simulations, etc., guiding students to understand different cultures, inherit ethnic culture, and enhance cross-cultural communication skills during language learning[11].

Personalized Guidance: Based on student learning profiles constructed through AI technology, provide personalized learning plans and guidance for each student. Teachers can monitor student learning data in real-time via intelligent platforms, offering precise tutoring targeting students' weak areas. Simultaneously, students are encouraged to autonomously choose learning content and pace based on their own needs and interests, achieving an organic combination of self-directed learning and teacher guidance.

5.2 Designing an AI-Based Spoken Language Teaching Implementation Plan

Targeting non-English major undergraduate students in an ethnic college, using the College English Level 3 spoken language course as the teaching content, an AI-based spoken language teaching implementation plan is designed as follows:

Pre-Class Preparation Phase: Based on teaching objectives and student learning profiles, teachers push preview resources through the intelligent teaching platform,

including relevant vocabulary, sentence patterns, cultural background knowledge, and oral practice tasks. Students complete preview tasks via the platform, which automatically records their progress and feeds the data back to the teacher. Teachers adjust classroom teaching plans based on the feedback.

Classroom Teaching Phase: Adopt a "blended online + offline" teaching model. For the online part, use VR technology to create virtual scenarios like cross-cultural communication and business dialogues, organizing students for group simulation practice. The intelligent speech interaction system provides real-time evaluation and feedback on students' expression. For the offline part, teachers address common problems identified during online practice through centralized explanations and demonstrations, organize group discussions, speeches, and other activities to strengthen interaction between teachers and students and among students. Concurrently, teachers design culture-related oral tasks incorporating students' ethnic cultural backgrounds, such as asking students to introduce their ethnic traditional festivals or customs in English, achieving the integration of cultural immersion and language learning.

Post-Class Consolidation Phase: Based on students' classroom performance, the intelligent platform pushes personalized post-class practice tasks, such as pronunciation correction exercises, topic expansion practice, and cross-cultural communication case analysis. Upon completion, the platform automatically generates learning reports, providing feedback on learning outcomes and progress. Students can also use the platform's collaborative learning function for online oral communication practice with peers. Teachers provide real-time guidance and answer questions regarding students' post-class learning via the platform.

Teaching Evaluation Phase: Adopt a diversified evaluation method combining formative and summative assessment. Formative assessment mainly includes students' preview status, classroom participation, and post-class exercise completion, automatically recorded and scored by the intelligent platform. Summative assessment combines AI oral evaluation system results with teacher evaluation to comprehensively assess students' overall oral proficiency. Evaluation results are promptly provided to students, helping them understand their strengths and weaknesses and clarify future learning directions.

5.3 Building an Intelligent Spoken Language Teaching Resource System

Integrate High-Quality Resources: Collect and organize high-quality English spoken language teaching resources domestically and internationally, including English film clips, audiobooks, authentic dialogue materials, and cross-cultural communication cases. Use AI technology to classify, annotate, and optimize these resources, building a standardized resource repository. Simultaneously, considering the characteristics of ethnic colleges, collect and organize cultural materials from various ethnic groups, transforming them into English spoken language learning resources, such as English introductions to ethnic cultures or English adaptations of ethnic folktales, enriching the cultural connotation of the resource repository[12].

Develop Personalized Resources: Utilize AI's natural language generation capabilities to automatically create personalized oral practice questions, dialogue scripts, study guides, and other resources based on students' proficiency levels, interests, and learning needs. For example, generate simple daily conversation exercises for students with weak foundations and complex topic discussion scripts for more advanced students.

Construct a Resource Sharing Platform: Establish an intelligent spoken language teaching resource sharing platform for efficient resource management and sharing. Students can access needed learning resources anytime, anywhere via the platform. Teachers can upload and update teaching resources and engage in resource co-construction and sharing activities. The platform also supports resource exchange and evaluation functions, promoting resource sharing and interaction among teachers and students.

5.4 Enhancing Teachers' AI Teaching Application Ability

Conduct Specialized Training: Regularly organize English teachers to participate in specialized training on integrating AI technology with English spoken language teaching. Content includes operating intelligent teaching platforms, basic principles of AI technology, and designing and implementing intelligent spoken language teaching models. Invite experts in relevant fields for lectures and guidance to enhance teachers' theoretical understanding and practical skills.

Form Teaching Teams: Establish teaching teams composed of English teachers, IT teachers, and educational technology experts to conduct teaching research activities on AI-based spoken language teaching. Team members collaborate, jointly researching problems encountered in teaching, exploring effective teaching strategies and methods, and developing personalized teaching resources to improve the overall strength of the teaching team.

Encourage Teaching Practice and Innovation: Encourage teachers to actively participate in practical exploration of AI-based spoken language teaching and engage in teaching reform project research. Support teachers in combining AI technology with their own teaching characteristics to innovate teaching models and methods. Simultaneously, establish mechanisms for evaluating teaching outcomes and providing incentives, recognizing and rewarding teachers who achieve excellent results in AI spoken language teaching practice (e.g., in professional title evaluation, awards, or project applications) to stimulate teachers' enthusiasm for teaching innovation.

6 Practical Teaching Research – A Case Study of an Ethnic College

6.1 Research Subjects

Two classes of non-English major undergraduate students from the 2024 cohort at an ethnic college were selected as experimental subjects: an experimental class of 45 students and a control class of 45 students. Students in both classes come from various ethnic minority regions, including Yi, Tibetan, Hui, Miao, and others, showing strong

comparability in terms of English foundation and ethnic cultural background. The experimental class adopted the AI-based "Technology Empowerment + Cultural Immersion + Personalized Guidance" spoken language teaching model, while the control class used the traditional spoken language teaching model.

6.2 Research Duration and Content

The research lasted one semester (18 weeks). The teaching content was the College English Level 3 spoken language course, covering modules such as daily communication, topic discussion, speeches, and cross-cultural communication. The experimental class followed the teaching implementation plan designed earlier, making full use of technologies like the AI spoken language teaching platform, VR virtual scenarios, and intelligent speech interaction systems. The control class employed the traditional class-based teaching system, using methods like teacher explanation, student repetition, and group discussions.

6.3 Data Collection and Analysis Methods

Data Collection: (1) Performance Data: Collected initial, mid-term, and final oral test scores for both classes. The final oral test combined AI oral evaluation system results with teacher evaluation. (2) Questionnaire Data: After the practice period, a questionnaire was distributed to students in the experimental class to understand their satisfaction with the AI-based teaching model, learning experience, and self-perceived learning outcomes. 45 questionnaires were distributed, with 45 valid responses returned (100% effective rate). (3) Interview Data: Conducted semi-structured interviews with 10 students from the experimental class and 2 English teachers to gain in-depth understanding of the model's implementation process, existing problems, and suggestions for improvement.

Analysis Methods: Used SPSS 26.0 statistical software to conduct independent samples t-tests on the performance data of the two classes, comparing differences in learning outcomes. Descriptive statistical analysis was performed on the questionnaire data to understand student satisfaction and learning experience. Qualitative analysis was conducted on the interview data to extract key information, providing a basis for optimizing the teaching model[13].

6.4 Research Results and Analysis

Performance Analysis: Initial oral test scores showed average scores of 62.3 for the experimental class and 61.8 for the control class. An independent samples t-test result was $t=0.523$, $p=0.602 > 0.05$, indicating no significant difference in English oral proficiency between the two classes before the experiment, establishing comparability. Mid-term oral test scores showed an average of 70.5 for the experimental class and 65.2 for the control class, with $t=3.215$, $p=0.002 < 0.05$, indicating the experimental class's oral performance was significantly higher. Final oral test scores showed an average of 78.6 for the experimental class and 68.3 for the control class, with $t=4.872$, $p=0.000 < 0.01$,

indicating that after one semester, the experimental class's English oral level was significantly superior to the control class. The AI-based spoken language teaching model effectively enhanced students' English oral ability.

Questionnaire Results Analysis: (1) Learning Satisfaction: 86.7% of students expressed satisfaction or high satisfaction with the AI-based teaching model, believing it stimulated learning interest and improved outcomes. Only 13.3% were somewhat dissatisfied, mainly due to unfamiliarity with the platform's operation and perceived room for improvement in the realism of some virtual scenarios. (2) Learning Experience: 91.1% of students believed the virtual practice scenarios created by AI technology increased oral practice opportunities and improved fluency. 84.4% thought personalized learning resources and guidance helped them address weak areas. 82.2% felt the cultural immersion components enhanced their cross-cultural communication awareness and ability. (3) Learning Initiative: 88.9% reported significantly increased initiative in English oral learning under the new model, actively completing preview and post-class tasks and participating in classroom interactive activities.

Interview Results Analysis: Students generally found the AI-based model novel and interesting. Virtual scenario practice allowed them to speak English boldly in a relaxed atmosphere, effectively overcoming anxiety. Personalized resources and feedback helped them quickly identify and correct problems. Students also offered suggestions for improvement, such as adding more oral practice tasks related to their own ethnic cultures, optimizing the platform's user interface, and enhancing the realism of virtual scenarios. Teachers indicated that AI application effectively reduced teaching workload and improved efficiency. The intelligent platform allowed real-time monitoring of student progress, enabling precise teaching. However, they also faced challenges like unfamiliarity with platform operation and difficulty in developing teaching resources, indicating a need to further enhance their own technical application skills.

6.5 Practical Conclusion

The one-semester practical teaching research demonstrates that the AI-based "Technology Empowerment + Cultural Immersion + Personalized Guidance" spoken language teaching model can effectively enhance the English oral ability of undergraduate students in ethnic colleges and universities, proving significantly superior to the traditional model. This model stimulates student interest and initiative, increases oral practice opportunities, and enhances cross-cultural communication awareness and ability. Simultaneously, it reduces teachers' workload, improves teaching efficiency, and enables precise instruction. However, issues were identified during practice, such as room for improvement in platform adaptability, imperfect teaching resource development, and the need to strengthen teachers' technical application skills, requiring further optimization and refinement in future teaching practice[14].

7 Optimization Strategies for Applying AI in Undergraduate English Spoken Language Teaching in Ethnic Colleges and Universities

7.1 Enhancing the Adaptability of AI Technology to Teaching

Optimize Intelligent Teaching Platform Functions: Collaborate with technology development companies to customize and optimize intelligent spoken language teaching platforms according to the characteristics and teaching needs of students in ethnic colleges. Simplify the platform's user interface, improve its stability and smoothness. Add cultural adaptation functions, incorporating more ethnic cultural elements and designing oral practice tasks and virtual scenarios related to ethnic cultures. Optimize intelligent speech recognition and assessment algorithms to improve accuracy in recognizing the pronunciation characteristics of minority students, ensuring the fairness and objectivity of evaluation results.

Strengthen Training and Guidance on Technology Application: Provide systematic operational training on the intelligent teaching platform for both students and teachers through various methods like online tutorials, offline lectures, and one-on-one guidance to help them master platform functions and usage. Establish a technical support team to promptly resolve technical issues encountered by teachers and students during platform use, ensuring the smooth conduct of teaching activities.

7.2 Improving the Construction of the Intelligent Spoken Language Teaching Resource System

Increase Investment in Resource Development: Seek funding support from the institution and relevant departments to increase investment in developing intelligent spoken language teaching resources. Form professional resource development teams to create a batch of high-quality, ethnically distinctive teaching resources tailored to the characteristics of ethnic colleges and students' cultural backgrounds, such as English textbooks on ethnic culture, cross-cultural communication case libraries, and virtual cultural experience scenarios.

Promote Resource Co-Construction and Sharing: Strengthen cooperation with other ethnic colleges, regular universities, and relevant educational institutions to establish resource co-construction and sharing mechanisms. Integrate high-quality spoken language teaching resources through joint development and resource exchange, enriching the resource repository. Encourage teachers and students to participate in resource construction and evaluation, fostering a positive atmosphere of co-creation and sharing.

7.3 Enhancing Teachers' Comprehensive Competency

Build a Diversified Teacher Training System: Establish a diversified teacher training system integrating technology application, teaching philosophy, and cross-cultural teaching ability. Regularly organize teachers to participate in training and seminars on

AI technology, cross-cultural communication teaching, and spoken language teaching methods. Encourage teachers to engage in exchange visits to advanced institutions to learn from their successful experiences in AI-based spoken language teaching. Support teachers' involvement in relevant research projects and teaching reform practices to enhance their research capability and teaching innovation ability.

Establish Teacher Incentive Mechanisms: Establish sound teacher incentive mechanisms to recognize and reward teachers who demonstrate outstanding performance and achieve excellent results in AI spoken language teaching practice, offering preferential treatment in areas like professional title evaluation, awards, and project applications. Encourage teachers to actively participate in intelligent teaching resource development and teaching model innovation to stimulate their teaching enthusiasm and innovative drive.

7.4 Strengthening Supervision and Optimization of the Teaching Process

Establish Teaching Quality Monitoring Mechanisms: Establish robust AI-based spoken language teaching quality monitoring mechanisms. Use intelligent platforms to collect and analyze teaching data in real-time, monitoring the entire teaching process. Regularly evaluate and provide feedback on teaching effectiveness, promptly identify problems, and adjust teaching strategies and plans. Simultaneously, strengthen supervision of students' learning processes, ensuring learning outcomes.

Emphasize Teaching Reflection and Improvement: Encourage teachers to regularly engage in teaching reflection, summarizing experiences and shortcomings from AI spoken language teaching practice, and continuously optimize teaching models and methods. Strengthen communication between teachers and students, promptly understanding students' learning needs and suggestions, and adjust teaching content and activities based on student feedback to enhance teaching pertinence and effectiveness[15].

7.5 Fostering a Conducive Environment for Intelligent Teaching

Strengthen Publicity and Guidance: Utilize various channels such as the university website, official WeChat accounts, and campus radio to publicize the advantages and success cases of applying AI technology in English spoken language teaching. Ensure teachers and students fully recognize the importance and necessity of intelligent teaching, shift traditional teaching perspectives, and actively participate in intelligent teaching reform.

Organize Diverse Intelligent Teaching Activities: Organize diverse activities like English oral competitions, cross-cultural communication simulation contests, and intelligent oral learning experience sharing sessions to create a strong atmosphere for intelligent spoken language learning. Encourage students to actively participate, showcase their learning achievements, and enhance their sense of accomplishment and confidence in learning.

8 Conclusion

Through the practice and exploration of applying AI to undergraduate English spoken language teaching in ethnic colleges and universities, the following conclusions are drawn: (1) This teaching faces challenges such as significant student language proficiency disparities, scarcity of practice scenarios, insufficient cross-cultural communication cultivation, scarce teaching resources, and singular evaluation methods, urgently requiring reform. (2) AI technology holds significant application value in this context, capable of achieving personalized teaching, creating immersive practice scenarios, strengthening cross-cultural communication cultivation, enriching teaching resources, and innovating evaluation methods. (3) The AI-based "Technology Empowerment + Cultural Immersion + Personalized Guidance" teaching model can effectively enhance undergraduate students' English oral ability and cross-cultural communication literacy in ethnic colleges, stimulate learning interest and initiative, and improve teaching efficiency. (4) During practice, strategies such as enhancing technology adaptability, improving the resource system, elevating teacher competency, strengthening teaching supervision, and fostering a supportive environment are needed to further optimize the integration of AI and spoken language teaching.

With the continuous development of AI technology, its application prospects in undergraduate English spoken language teaching in ethnic colleges will broaden further. Future research can delve deeper in the following aspects: (1) Strengthen research on the deep integration of AI technology and ethnic culture, developing more intelligent teaching resources and models with ethnic characteristics to enhance students' cultural confidence and cross-cultural communication ability. (2) Explore the long-term application effects of AI technology in English spoken language teaching, conducting longer-term longitudinal studies to provide a basis for the continuous optimization of teaching models. (3) Pay attention to AI ethics in education, researching how to protect student privacy and ensure the fairness and rationality of technology application in intelligent teaching. (4) Strengthen interdisciplinary research, integrating theories and methods from pedagogy, linguistics, computer science, ethnology, and other disciplines to promote the deep integration of AI with foreign language teaching in ethnic colleges, providing stronger support for the development of education in these institutions and talent cultivation in ethnic regions.

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