Research on the Compound Talent Cultivation Program for AI-Empowered External Publicity Translation Serving the "Ice and Snow Silk Road"

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Abstract: *To address the mismatch between the supply of external publicity translation talent for ice and snow tourism in Jilin Province and the demands of the industry under the context of the "Ice and Snow Silk Road" initiative, this study, guided by the need to align with the cultural and tourism communication requirements of the "Ice and Snow Silk Road," focuses on the enabling value of AI technology. Centered on key aspects such as "strengthening expertise in ice and snow tourism" and "enhancing the development of teacher echelons," and through methods including literature review, field research, action research, and comparative experiments, this research has developed and validated a "one core, two lines, six wings" AI-empowered talent cultivation program for ice and snow tourism external publicity translation across five research stages. The results indicate that this program, which focuses on cultivating compound external publicity translation competence as its core, integrates the transmission of ice and snow tourism expertise and the empowerment of AI translation technology as two parallel lines, supported by six auxiliary systems. It effectively enhances the quality of talent cultivation and significantly improves graduates' alignment with the development needs of the "Ice and Snow Silk Road." The findings provide a feasible pathway and practical reference for higher education institutions to optimize the cultivation system for external publicity translation talent and to support the international development of regional ice and snow tourism industries.*

Keywords: *Ice and Snow Silk Road; AI-empowered; external publicity translation talent*

1. Introduction

1.1 Research Background

As a significant extension of the Belt and Road Initiative into the ice and snow economy, the development of the "Ice and Snow Silk Road" provides a crucial platform for the internationalization of Jilin Province's ice and snow tourism industry. With its premium ice and snow tourism resources such as the Changbai Mountain ice and snowscape and the Chagan Lake Winter Fishing, Jilin Province stands as one of the core regions for the development of China's ice and snow tourism industry. However, the current external publicity efforts for Jilin's ice and snow tourism face a particularly prominent issue: a severe shortage of professional translation talent. Existing translators commonly exhibit shortcomings, including insufficient specialized knowledge in ice and snow tourism, a lack of proficiency in applying AI translation technologies, and deficiencies in cross-cultural communication literacy. This situation makes it difficult to meet the demands for precise and efficient external publicity translation services required by the "Ice and Snow Silk Road" initiative, thereby constituting a major bottleneck that restricts the enhancement of the region's international influence in ice and snow tourism.

At the same time, the rapid development of AI technology presents new opportunities for transforming the cultivation of translation talent. Integrating AI technology into the process of cultivating external publicity translation talent for ice and snow tourism, and constructing a talent cultivation program aligned with the development needs of the "Ice and Snow Silk Road," represents both an inevitable requirement for universities to respond to regional industrial development and to advance the applied transformation of translation programs, as well as a significant measure to support the cultural dissemination and economic cooperation of the "Ice and Snow Silk Road."

1.2 Research Significance

This study integrates the perspective of the "Ice and Snow Silk Road," AI technology, and the cultivation of translation talent for Jilin Province's ice and snow tourism to construct a "one core, two lines, six wings" cultivation model. This enriches the theoretical system of translation talent cultivation and provides new perspectives and ideas for research in related fields. Theoretically, it enriches the theoretical framework for cultivating specialized translation talent within the context of the "Ice and Snow Silk Road," expands the research dimensions on the integration of AI technology and translation education, and offers theoretical support for aligning the cultivation of regionally distinctive translation talent with industrial development needs. Practically, it establishes a targeted and feasible AI-empowered cultivation program. This program effectively enhances the professional competence and practical skills of external publicity translation talent for ice and snow tourism, alleviates the supply-demand imbalance for such talent within Jilin's ice and snow tourism industry, and provides solid human resource support for the development of the "Ice and Snow Silk Road." The study fills a research gap in cultivation models that combine AI technology under the Belt and Road context for this specific field, offering a reference for cultivating translation talent in other regional specialty industries. It contributes to elevating the international profile of Jilin's ice and snow tourism industry, fosters exchanges and cooperation with countries along the Belt and Road in the realm of ice and snow tourism, provides practical guidance for teaching reforms in English translation programs at Jilin's universities, promotes the further application and dissemination of AI technology in education, advances the process of educational informatization, and improves the efficiency and effectiveness of teaching and learning.

2. Research Program

The program for this research will unfold from the following aspects:

2.1 Research Objectives

The core objective of this research is to construct an AI-empowered talent cultivation program for external publicity translation in ice and snow tourism that aligns with the development requirements of the "Ice and Snow Silk Road." The key research priorities include enhancing the instruction of specialized knowledge in the ice and snow tourism sector to improve talent alignment with industry needs; strengthening the development of teacher echelons to build a composite teaching team; and deeply integrating AI technology to construct and verify the effectiveness of the "one core, two lines, six wings" cultivation model.

2.2 Research Methods

The research methods employed in this study are as follows:

2.2.1 Literature Research Method

This study will consult domestic and international literature concerning AI-empowered translation talent cultivation, the "Ice and Snow Silk Road" initiative and tourism industry development, and ice and snow tourism translation. This process aims to analyze and synthesize the current state of research and establish the theoretical foundation.

2.2.2 Survey Research Method

We will employ methods such as questionnaires and on-site interviews to investigate the demands of ice and snow tourism enterprises in Jilin Province for translation talent and to understand the current state of translation talent cultivation in universities.

2.2.3 Case Study Method

We will select certain universities and ice and snow tourism enterprises as case study subjects. By tracking and observing their practices in translation talent cultivation, we will analyze existing problems and summarize relevant experiences.

2.2.4 Model Construction Method

Based on preliminary research findings, we will construct the "one core, two lines, six wings"

cultivation model and provide theoretical justification for it.

2.2.5 Experimental Research Method

We will select a certain number of students as experimental subjects. Following the constructed cultivation model, we will conduct teaching experiments and perform a comparative analysis of changes in the students' capabilities before and after the experiment.

2.3 Research Process

This research spans a period of two years and is systematically advanced through five stages:

2.3.1 Stage One: Preparation Phase

The research team was formed to clarify the research objectives and tasks, and to formulate a detailed research plan and schedule. Extensive literature research was conducted to collect and organize relevant research findings and materials from both domestic and international sources, culminating in the compilation of a literature review. Survey questionnaires and interview outlines were designed, followed by the execution of pilot surveys and pilot interviews.

2.3.2 Stage Two: Investigation and Analysis Phase

Field research was carried out, involving questionnaire surveys and on-site interviews with ice and snow tourism enterprises in Jilin Province as well as with teachers and students from university translation programs to collect data and information. The research team organized and analyzed the collected survey data, processed the information using statistical software, and derived relevant conclusions regarding the demand for translation talent within Jilin's ice and snow tourism industry. A thorough analysis was conducted on the current application status and developmental trends of AI technology in translation talent cultivation. Based on the survey results, the team formulated a preliminary conceptual framework for the "one core, two lines, six wings" cultivation model.

2.3.3 Stage Three: Model Construction Phase

Based on the findings from the earlier investigation and analysis, the research team refined each component of the "one core, two lines, six wings" cultivation model, detailing the specific content of its core objective, the two main lines, and the six supporting aspects. Implementation rules for the cultivation model were formulated, covering curriculum design, teaching methodologies, practical arrangements, and assessment methods. The team developed relevant teaching resources, identified pilot classes, and completed all necessary preparatory work for the teaching practice.

2.3.4 Stage Four: Practical Application Phase

Teaching practice activities were carried out in the pilot classes in accordance with the "one core, two lines, six wings" cultivation model. The research team regularly tracked and monitored the teaching practice process, collecting students' learning data, teachers' instructional feedback, and evaluation comments from enterprises. The research team organized mid-term seminars to discuss the progress and, based on the practical experience, made adjustments and optimizations to the cultivation model. A comparative experiment involving an experimental group and a control group was conducted, and the corresponding experimental data were collected.

2.3.5 Stage Five: Evaluation and Optimization Phase

The research team conducted a comprehensive evaluation of the teaching practice outcomes, performed statistical analysis on the experimental data, compared the learning effectiveness between the experimental group and the control group, and verified the implementation results of the cultivation model. Subsequently, the team compiled the research report and related academic papers. The research findings were disseminated to provide reference for universities and enterprises.

3. Preliminary Research Findings

3.1 Demand for and Current State of Cultivating External Publicity Translation Talent for Ice and Snow Tourism in Jilin Province

3.1.1 Core Characteristics of Talent Demand

The survey results indicate that, within the context of the "Ice and Snow Silk Road" initiative, the

demand for external publicity translation talent among ice and snow tourism enterprises in Jilin Province exhibits characteristics of being "compound, technology-oriented, and industry-specific." Specifically, 83% of enterprises explicitly require talent to possess solid professional knowledge in ice and snow tourism, covering areas such as terminology for ice and snow sports, the cultural connotations of scenic spots, and the interpretation of folk customs. Furthermore, 79% of enterprises emphasize that talent must be proficient in applying AI translation tools (e.g., Trados, DeepL, Baidu Translate Enterprise Edition) and capable of efficiently completing tasks like translating external publicity materials and optimizing machine translation outputs. Additionally, 75% of enterprises require talent to possess cross-cultural communication literacy, enabling them to accurately convey the core cultural essence of Jilin's ice and snow tourism.

3.1.2 Shortcomings of the Existing Cultivation System

Significant deficiencies exist in the current cultivation of external publicity translation talent for ice and snow tourism within universities. First, there is insufficient integration of specialized ice and snow tourism knowledge. Only 12% of university translation programs offer elective courses related to tourism, and none include a dedicated module on ice and snow tourism knowledge. Second, there is a lack of empowerment through AI technology. In 68% of university translation programs, the application of AI technology in teaching remains superficial, often limited to introductory lectures on tools, without systematic practical training courses. Third, the structure of the teaching faculty is imbalanced. Composite teachers possessing both knowledge of ice and snow tourism and skills in AI translation technology constitute less than 15% of the faculty. Fourth, practical teaching is disconnected from industry needs. The external publicity translation practice available to students predominantly consists of simulated projects, lacking real-world enterprise scenario experience.

3.2 Core Components of the "One Core, Two Lines, Six Wings" AI-Empowered Cultivation Program

Based on the survey findings and practical exploration, the core components of the ultimately constructed "One Core, Two Lines, Six Wings" AI-Empowered Cultivation Program are as follows:

3.2.1 One Core

The "One Core" is defined as "the composite capability for external publicity translation in ice and snow tourism that aligns with the development of the 'Ice and Snow Silk Road.'" This core integrates four essential competencies: language translation proficiency, professional knowledge in ice and snow tourism, AI technology application skills, and cross-cultural communication competence.

3.2.2 Two Parallel Lines

First, the specialized knowledge line in ice and snow tourism: construct a three-tiered curriculum module of "Foundation + Core + Extension." The Foundation module includes courses such as "Introduction to Ice and Snow Tourism" and "Interpretation of Jilin Ice and Snow Culture." The Core module comprises courses like "Terminology Translation for Ice and Snow Sports" and "External Publicity Text Translation for Ice and Snow Scenic Areas." The Extension module offers courses including "Practices of Ice, Snow, and Cultural Tourism Exchanges in Northeast Asia" and "Cross-Cultural Communication in Ice and Snow Tourism," aiming to comprehensively strengthen students' knowledge base in ice and snow tourism.

Second, the AI translation technology empowerment line: establish a progressive cultivation pathway of "Cognitive + Practical Training + Application." The Cognitive stage includes the course "Fundamentals of AI Translation Technology," which explains the principles of AI translation and the features of mainstream tools. The Practical Training stage offers courses such as "Machine Translation Post-Editing (MTPE) Training" and "Construction and Application of an External Publicity Corpus for Ice and Snow Tourism," aimed at enhancing technical application skills through training with authentic language materials. The Application stage involves practical projects in AI-assisted translation, organizing students to participate in real-world enterprise external publicity translation tasks.

3.2.3 Six Supporting Wings

a. Restructuring the Curriculum System: For example, developing micro-courses for the "Ice and Snow Silk Road Specialization" (such as "Building an External Publicity Terminology Database for the Winter Olympics" and "Subtitle Translation for Short-Form Video Publicity") to align with the demands of different external publicity scenarios.

b. Building an Integrated Virtual-Physical Training Platform: Establish an "AI External Publicity

Translation Laboratory" on campus, equipped with a multilingual corpus system and virtual host training tools. Create "Enterprise Training Positions" off-campus, enabling participation in real external publicity activities such as ice and snow tourism festivals and cross-border tourism promotion events. AI systems will synchronously record practical data and generate competency profiles.

c. Strengthening the Teaching Faculty: Form a composite teaching team consisting of "university instructors + industry experts + technical consultants." Implement a faculty capability enhancement plan, organizing university instructors to attend specialized training on ice and snow tourism knowledge and workshops on AI translation technology. Hire seasoned industry publicity professionals as adjunct instructors to conduct practical teaching. Invite AI translation technology experts to provide specialized guidance. Through three main pathways—"institutional-enterprise cross-appointments, specialized training, and research collaboration"—the comprehensive quality of the teaching echelon is enhanced. Currently, among the teachers involved in the program, 80% have acquired the teaching capability in both ice and snow tourism knowledge and AI technology application.

d. External Publicity Training Project Drive: For instance, translating multilingual versions of the Jilin Province Ice and Snow Tourism White Paper; organizing students to participate in international publicity competitions (such as the "Northeast Asia Ice and Snow Culture Communication Translation Contest") to promote learning through competition.

e. Dynamic and Multifaceted Evaluation Empowerment: Establish a multifaceted evaluation system comprising "formative assessment + summative assessment + enterprise evaluation." Formative assessment (50% weighting) covers classroom performance, training assignments, and corpus development outcomes. Summative assessment (30% weighting) primarily evaluates the results of authentic external publicity translation projects. Enterprise evaluation (20% weighting) is scored by internship mentors from practice bases based on students' internship performance.

f. Full-Chain System Safeguard: Sign "customized cultivation agreements" with ice and snow tourism enterprises to achieve a closed loop of "learning-practice-employment."

3.3 Validation of the Cultivation Program's Effectiveness

3.3.1 Significant Improvement in Student Competence

Comparative experimental data indicate that students in the experimental group achieved an average score of 86.2 points on the ice and snow tourism professional knowledge test, representing a 31% improvement compared to the control group (65.8 points). In the assessment of AI translation tool application, the experimental group obtained an average score of 88.5 points, versus 59.3 points for the control group, marking a 49% improvement. In the practical exercise involving real-world enterprise external publicity translation projects, the pass rate for deliverables from the experimental group reached 92%, a 35% increase compared to the control group (68%). Furthermore, the deliverables from the experimental group surpassed those of the control group in aspects such as the accuracy of cultural connotation transmission and the fluency of language expression.

3.3.2 High Enterprise Satisfaction

Among the 10 ice and snow tourism enterprises participating in the practical evaluation, their satisfaction rate with the students from the experimental group reached 95%. They noted that the students possessed "solid expertise in ice and snow tourism, proficient application of AI translation technology, and external publicity translation deliverables that closely align with industry needs." Eight of these enterprises expressed their willingness to give hiring priority to graduates cultivated under this program.

3.3.3 Notable Achievements in Teaching Faculty Development

Through specialized training and practical experience, the proportion of interdisciplinary teachers within the teaching team has increased from 15% to 80%. Team members have completed three research projects related to ice and snow tourism external publicity translation, published five academic papers, and developed four specialized courses, resulting in a simultaneous enhancement of both their teaching and research capabilities.

4. Research Innovation and Limitations

4.1 Adaptability and Innovation of the Cultivation Program

The "one core, two lines, six wings" AI-empowered cultivation program constructed by this research precisely aligns with the demand for external publicity translation talent in ice and snow tourism under the "Ice and Snow Silk Road" initiative. Guided by industry needs, the program deeply integrates specialized knowledge of ice and snow tourism and AI translation technology into the entire talent cultivation process, thereby overcoming the limitations of traditional translation talent cultivation, which often overemphasizes theory, neglects practice, and lacks distinctiveness. Among its features, the development of the teaching faculty serves as a core support mechanism. By enhancing the comprehensive quality of teachers through multiple pathways, it provides crucial assurance for the program's implementation. Furthermore, the deep integration of AI technology effectively improves the efficiency and quality of talent cultivation, achieving precise alignment between talent development and industry demands.

4.2 Research Limitations and Future Directions

The pilot scope of this research is limited to one university in Jilin Province, and the sample size is constrained. Therefore, the long-term effectiveness of the cultivation program requires further tracking and validation. Future efforts could expand the pilot scope by involving multiple universities and enterprises in collaborative research. Additionally, there is potential to deepen the integration of AI technology and teaching practices through the development of more targeted intelligent teaching systems. Strengthening cooperation with universities in countries along the "Ice and Snow Silk Road" to introduce international cross-cultural communication resources would further enhance the global adaptability of the cultivated talent.

5. Conclusion

Through systematic investigation and practical exploration, this research has clarified the core demand for external publicity translation talent in Jilin Province's ice and snow tourism sector within the context of the "Ice and Snow Silk Road" initiative. It has constructed and validated the "one core, two lines, six wings" AI-empowered cultivation program. By strengthening the instruction of specialized ice and snow tourism knowledge, enhancing the development of the teaching faculty, and deeply integrating AI translation technology, this program effectively improves the quality of talent cultivation and achieves precise alignment with the development needs of the "Ice and Snow Silk Road." The research findings not only provide a feasible plan for universities in Jilin Province to optimize their external publicity translation talent cultivation systems but also offer a reference for talent development in other regions within China with developed ice and snow tourism industries. This holds significant practical importance for promoting cultural dissemination and economic cooperation along the "Ice and Snow Silk Road."

Fund Projects

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