Application Scenario of AI-assisted Tools in Cross-cultural Adaptation of Russian-speaking International Students

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Abstract. Under the background of the "Belt and Road" initiative, the number of international students from Central Asian and Russian-speaking countries admitted by vocational colleges in Xinjiang has continued to grow, but they face multiple challenges in the process of cross-cultural adaptation. Based on the theory of cross-cultural adaptation and the perspective of educational digital transformation, this study takes 156 international students from Central Asia in three vocational colleges in Xinjiang as research subjects and explores the application scenarios and practical effects of intelligent auxiliary platforms in their adaptation process through a mixed-methods approach. The study constructs an intelligent support platform comprising three major modules and conducts a one-semester intervention experiment using a quasi-experimental design. The results show that the experimental group significantly outperformed the control group in psychological adaptation ($F=17.32$, $p<0.001$), sociocultural adaptation ($F=21.45$, $p<0.001$), and academic adaptation ($F=14.78$, $p<0.001$). Data analysis of platform usage indicates that emergency affairs guidance, cultural cognition construction, and academic norm learning constitute the three core application scenarios, accounting for 41.2%,34.7%, and 24.1% of total usage frequency, respectively. Qualitative research reveals that the platform's real-time response feature significantly alleviates students' adaptation anxiety, while the contextualized learning module enhances their cross-cultural communication skills. This study provides empirical evidence for the application of intelligent technology in cross-border education management and holds significant reference value for promoting the internationalization process of vocational colleges in border regions.

Keywords: intelligent assistant platform; Central Asian international students; cross-cultural adaptation; scenario analysis; vocational colleges

1. Introduction: Realistic Background and Research Significance

With the deepening of the Belt and Road Initiative, China's educational cooperation with Central Asian countries has become increasingly close. As the core area of the Silk Road Economic Belt, Xinjiang's higher vocational colleges have unique geographical advantages in admitting Central Asian international students. According to statistics, the number of international students admitted by Xinjiang's higher vocational colleges in 2022 increased by 156% compared to 2018, with Russian-speaking countries accounting for 83% of the total (Xinjiang Department of Education, 2023). However, language barriers, cultural differences, and insufficient management resources have led to numerous challenges for international students during their cross-cultural adaptation (Li Hongmei, 2022). Traditional support services for international students often rely on manual processing, which has limitations such as delayed responses, scattered resources, and low standardization.

The rapid advancement of intelligent technologies in recent years has opened new possibilities for educational management innovation. Intelligent auxiliary platforms, leveraging technologies such as natural language processing and machine learning, can provide personalized and real-time support services (Zhang Wei et al., 2023). However, existing research predominantly focuses on language learning scenarios, with limited exploration into the systematic application of intelligent tools throughout the cross-cultural adaptation process for international students, particularly in the specialized context of vocational colleges. To address this gap, this study investigates the application

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scenarios and implementation outcomes of intelligent auxiliary platforms in the cross-cultural adaptation of Central Asian international students, aiming to provide theoretical and practical references for international management innovation in frontier vocational colleges.

2. Theoretical Framework and Research Design

2.1 Theoretical Framework

Building upon the cross-cultural adaptation theory by Ward and Kennedy (1999) and Berry's (2005) cultural adaptation strategy model, this study develops a psychosocial-academic three-dimensional framework. The research further incorporates the technology acceptance model (Davis, 1989) to examine how international students' adoption of digital tools influences their adaptation processes.

2.2 Study Design

1) Study subjects: A total of 156 Central Asian international students from the 2023 cohort at three vocational colleges in Xinjiang were selected, including 89 from Kazakhstan, 45 from Kyrgyzstan, and 22 from Uzbekistan. Stratified random sampling was conducted by institution, resulting in an experimental group (n=78) and a control group (n=78).

2) Intelligent Platform Design: A customized platform developed within the WeChat ecosystem, featuring the following modules:

Intelligent Q&A System: Integrates a 1,200-question knowledge base with Russian natural language support

Situational Simulation Module: Developing 12 Interactive Learning Units of Life Scenes

Cultural navigation function: Provides multimedia introduction of local cultural resources

3) Data collection methods:

Quantitative data: The pre-test (α =0.87) and post-test (α =0.89) of the Cross-Cultural Adaptation Scale

Platform usage logs: record usage frequency, duration, and feature preferences

In-depth Interview: Semi-structured Interview with 30 Students in the Experimental Group

Observation Record: A Typical Case of Participatory Observation Record by Researchers

4) Data analysis: Repeated measures ANOVA was performed using SPSS 26.0, and qualitative data analysis was conducted with NVivo 12.

3. Findings of the Study

3.1 Analysis of Changes in Cross-Cultural Adaptation Levels

Note: ***p<0.001

As shown in Table 1, the experimental group demonstrated significantly higher improvements across all adaptation dimensions compared to the control group. Further analysis revealed that the most pronounced enhancement was observed in sociocultural adaptation, with an effect size of 0.23.

3.2 Feature Analysis of Platform Usage Scenarios

Through cluster analysis of platform log data, three core usage scenarios were identified:

1) Emergency Service Guidance Scenario (41.2%): Primarily involves sudden needs such as accommodation management, medical assistance, and document processing. Platform data indicates that the peak hours for such inquiries are on workdays (19:00-22:00), with an average response time of 2.3 minutes and a resolution rate of 94.7%.

2) Cultural cognitive construction scenarios (34.7%): This includes learning about festival customs, social etiquette, and religious beliefs. The usage pattern exhibits

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distinct stage-specific characteristics, with an 87% increase in usage one week prior to major festivals (e.g., Nowruz Festival, Spring Festival).
3) Academic norm learning scenarios (24.1%): Covering course selection guidance, examination arrangements, practical training requirements, and other academic-related content. The usage density during the semester beginning and examination week reached 2.1 times and 1.8 times the usual levels, respectively.

Table 1 Comparison of cross-cultural adaptation scores between the two groups (M± SD)Acknowledgements.

dimension	time point	Experimental group (n=78)	Control group (n=78)	F price	η ²
mental adaptation	before measurement	2.34±0.51	2.41±0.49	17.32	0.19
	aftertest	3.89±0.47	2.87±0.52		
social adjustment	before measurement	2.18±0.43	2.25±0.46	21.45	0.23
	aftertest	4.02±0.45	2.91±0.48		
academic adaptation	before measurement	2.27±0.39	2.32±0.41	14.78	0.16
	aftertest	3.76±0.43	2.84±0.45		

3.3 Qualitative findings of the adaptation process

The analysis of interview data reveals that the intelligent platform facilitates cross-cultural adaptation through the following mechanisms:
1) Reduction of uncertainty anxiety: Student A from Kazakhstan stated, 'Initially, I was very anxious about encountering problems and not knowing whom to consult. Now, I can check the platform at any time, which has significantly alleviated my sense of pressure in the new environment.' The predictability support provided by the platform has markedly mitigated the stress associated with the unfamiliar environment.
2) Fostering self-directed learning: Kyrgyz student B shared, 'I practice with the simulation feature before events to boost my confidence in real settings.' This feature effectively cultivates students' autonomous learning skills.
3) Building a Support Network: The "Peer Support" feature on the platform enables international students to share experiences and form social support. Observations indicate that 78.3% of international students participated in online interactions.

4. Discussion

4.1 Theoretical Implications

This study demonstrates that intelligent platforms effectively facilitate Berry's (2005) integrative adaptation strategy by providing a low-risk practice space and real-time support. This aligns with Kim's (2017) cross-cultural adaptation theory, which posits that adaptation is fundamentally a

dynamic equilibrium of learning and adjustment. The integration of intelligent technologies accelerates this equilibrium process.

4.2 Practical Value

The study demonstrates three key benefits of intelligent platforms in managing international students at vocational colleges: First, they enhance service efficiency by reducing routine task processing time by 68%; Second, they improve management precision through data analysis to identify evolving student needs; Third, they optimize resource allocation by directing limited administrative resources toward complex case management.

4.3 Significance of Innovation

The innovation of this study is that it systematically analyzes the application of intelligent tools in the adaptation process of international students in frontier higher vocational colleges for the first time, puts forward the three-dimensional application model of "emergency-cultural-academic", and explores a new mode of human-machine collaborative management service.

5. Conclusions and Recommendations

This study confirms that the intelligent auxiliary platform can effectively promote cross-cultural adaptation among international students in Central Asian Russian-speaking countries, with particularly significant effects on socio-cultural adaptation. The three major application scenarios constructed by the platform form a comprehensive support system, meeting the diverse needs of international students through various mechanisms.

Based on the findings, the following recommendations are made:

At the institutional level, the development of intelligent platforms should be integrated into the overall plan for internationalization, establishing a data-driven service management system for international students.

Technical dimension: We should continuously refine algorithm models, deepen our understanding of Central Asian cultural uniqueness, and enhance the cultural appropriateness of services.

Management level: Establish a human-machine collaborative mechanism to define the responsibility boundaries and coordination processes between intelligent platforms and manual services.

Policy-wise, it is recommended that education authorities develop guidelines for intelligent education management applications and establish a cross-institutional resource-sharing mechanism.

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