

Research on Path Optimization of Personalized Learning in International Chinese Language Education Driven by Digital and Intelligent Technology

Shuanjun An, Yafei Wu*

School of Literature, Bohai University, Jinzhou, Liaoning, China

**Corresponding Author*

Abstract: As a product of the deep integration of information technology and education, digital intelligence technology, characterized by data-driven operations, intelligent decision-making, and personalized services, provides a new path for the innovative development of international Chinese language education. This study explores the current application status and optimization paths of digital intelligence technology in personalized learning in international Chinese language education. By integrating multidimensional data such as students' learning behaviors, interest preferences, and language abilities, a personalized learning path is constructed. The research shows that digital intelligence technology can not only enhance students' intrinsic motivation and learning effectiveness but also promote their mastery of Chinese knowledge and development of cross-cultural communication skills. Using questionnaire surveys and data analysis methods, the study finds that digital intelligence technology has significant effects in improving learning efficiency and enriching learning resources, but still needs improvement in the accuracy of personalized suggestions and the development of cross-cultural functions. In the future, we should further optimize the technological path, combining adaptive recommendation and real-time feedback functions to promote the development of international Chinese language education towards intelligence and personalization.

Keywords: Digital and Intelligent Technology; International Chinese Language Education; Personalized Learning; Path Optimization; Student Development

1. Research Background and Problem

Proposal

With the continuous deepening and expansion of globalization, international Chinese language education, as an important carrier of cross-cultural communication, is receiving increasing attention from the academic community for its global influence and academic value. At the same time, with the rapid development of digital and intelligent technologies, especially the breakthrough progress of generative artificial intelligence technology, researchers are reconstructing and critically reflecting on the traditional epistemological paradigm. Knowledge is no longer seen as a static concept, but is understood as a dynamic process that includes "knowledge" and "consciousness" [1]. However, traditional teaching methods often overlook individual differences among students, making it difficult to meet students of different levels and needs. Entering the era of digital intelligence, artificial intelligence and big data technology provide strong support for students' learning situation analysis, personalized recommendations, and instant evaluation feedback, promoting scientific "identification of talents", reasonable "cultivation of talents", and appropriate "evaluation of talents" [2]. At the same time, precision teaching is rooted in the concept and principle of teaching according to individual needs, characterized by respect for individual differences, targeted implementation of educational interventions, and a commitment to exploring students' innovative potential and cultivating their creative abilities. This is also the foundation for cultivating innovative talents [3]. Based on the current development of digital education and the problems existing in the international Chinese language education profession, this article will explore the application of digital technology in the construction of personalized learning paths for

international Chinese language education, in order to provide ideas for the innovative development of international Chinese language education.

2. Theoretical Framework and Development Status of Digital Intelligence Technology

2.1 Definition and Development of Digital Intelligence Technology

Digital intelligence technology is an organic integration of digitization and intelligence, which can be understood as “digitization+intelligence”. It is a process of integrating and applying intelligent technologies such as machine learning and artificial intelligence on the basis of digitization. At present, in the context of the digital wave sweeping the world, digital technologies represented by artificial intelligence, big data, etc. are profoundly changing various fields of society and becoming the leading force in promoting the construction of an education powerhouse [4]. Based on a review of existing literature, Mao Yufei constructed a theoretical framework for how the application of digital technology affects the innovation performance of human resources practitioners, and empirically tested its impact effects and mechanisms.[5] The rapid development of digital intelligence technology has a profound impact on the life and work of human society. As a comprehensive innovation system that integrates cutting-edge technologies such as big data analysis, artificial intelligence algorithms, and cloud computing, this technology is triggering paradigm shifts in multiple fields. In the field of business operations, digital intelligence has achieved precision in marketing strategies, eliminating the need for traditional intermediaries such as agents and retailers in production and sales processes. Instead, it enables direct communication between producers and consumers through information and data carriers [6], enabling enterprises to optimize their product and service systems based on data-driven decision-making mechanisms. In the field of education, digital technology can construct optimized knowledge acquisition paths based on students’ cognitive characteristics, achieving personalized education. Meanwhile, digital intelligence technology enhances students’ learning experience and interest through digital and situational teaching methods, which is the

key to promoting the transformation of teaching methods in universities [7]. With the continuous advancement of technology, the future application prospects of digital intelligence technology will be even broader.

2.2 Current Status of the Application of Digital Intelligence Technology in the Field of Education

The integration of digital technology into education is an inevitable trend in social development, which will give tremendous energy to the modernization of education. The empowerment of digital intelligence technology in the modernization of basic education has the connotation of using diverse digital intelligence resources to meet people’s various development needs, using digital intelligence to provide support for people’s free development, and using personalized resources to provide accurate services for students [8]. It can stimulate the potential and vitality within the education system, promote innovative development and quality improvement of education, and better respond to the educational challenges and development needs of the digital intelligence era. As a part of the digital society, school education should not only carry out educational activities based on social development, but also promote social development through educational activities, forming an educational practice style that is consistent with social development [9]. Digital technology has become an important component of the education system. Education is evolving from traditional teacher-student relationships to more complex teacher-student relationships. This change not only changes the operational mode of education, causing a restructuring of the functional structure of the education system, but also guides the direction for high-quality development of education [10]. With the support of digital intelligence technology, students can break through the limitations of time and space, access online course platforms and digital learning resources at any time, thereby significantly improving the flexibility and accessibility of the learning process. More importantly, digital intelligence technology can accurately evaluate students’ knowledge mastery and learning effectiveness through big data analysis methods, and provide teachers with teaching optimization suggestions based on empirical data, achieving the improvement of teaching quality.

2.3 Comparison between Traditional Teaching and Digital Intelligence Driven Teaching

The traditional teaching model is teacher led, using traditional teaching media such as lectures, blackboard displays, and textbooks, and emphasizing the systematic and complete transmission of knowledge systems. In contrast, the teaching model driven by digital intelligence technology is based on constructivist theory,

with students at the center. Through digital technologies such as artificial intelligence algorithms and virtual reality simulations, personalized learning paths can be customized and highly interactive learning situations can be created. There are significant differences between the two teaching modes in terms of teaching design concepts, technological application dimensions, and teaching effectiveness, as detailed in Table 1.

Table 1. Comparison of Advantages between Traditional Teaching and Digital Intelligent Driving Teaching

	Traditional teaching	Digital intelligent assisted teaching
Efficiency of knowledge teaching	Teachers are experienced and able to impart knowledge systematically	Provides a large number of learning resources, students can choose the content and pace of study
Personalized learning	It is difficult to consider the individual differences of students	Provide personalized learning paths and resource recommendations based on student data
Teacher-student interaction	The interaction between teachers and students is limited and the students' participation is not high	Provide multiple interactive approaches, such as online discussions, to increase student engagement
Teaching assessment	The evaluation method is single, mainly based on the test results	Learning data can be collected and analyzed in real time to provide a more comprehensive and objective assessment
Technology dependence	Low dependence on technology	Highly dependent on technical equipment and network environment
teacher role	Teachers dominate the classroom and students passively accept	Teachers need to master new technologies and teaching methods as their roles change
Cost of learning	Relatively low cost	Need to invest hardware, software and network resources, high cost
Emotional role (or influence)	Face-to-face communication between teachers and students is more direct and emotional interaction	Lack of face-to-face communication and relatively weak emotional interaction

Traditional teaching and education models driven by digital technology have their own advantages and limitations in terms of teaching objectives, implementation paths, and educational outcomes, and there is a significant complementary relationship between the two. Future education should combine the advantages of both, construct a student-centered blended learning model, integrate online and offline teaching, and fully leverage the technological advantages of intelligent technology in personalized learning analysis, optimized allocation of teaching resources, and improvement of educational efficiency. At the same time, attention should be paid to preserving the elements of interpersonal interaction, emotional connection, and humanistic value transmission in traditional face-to-face teaching,

in order to achieve the organic unity of technological empowerment and educational essence.

3. The Multidimensional Impact of Digital Technology on International Chinese Language Education

3.1 The Empowering Effect of Digital Technology on International Chinese Language Education

The rapid advancement of digitization heralds the arrival of the digital age, which will have a disruptive impact and change on various fields of human society, and undoubtedly profoundly affect the international Chinese language education ecosystem [11]. Liu Bing pointed out that the impact of digital technology on

international Chinese language education is comprehensive [12]. The rise of artificial intelligence technology and the widespread application of big data have led to changes in teaching models and talent cultivation. The integration of digital technology has significantly improved the personalization and interactivity of international Chinese language education. By analyzing students' learning behavior and progress, the teaching system can customize personalized learning plans for each student, provide targeted learning resources, and meet students of different levels and needs. At the same time, digital technology can also promote interaction between teachers and students, whether in online classrooms or remote tutoring, achieving efficient communication and improving teaching effectiveness. At the same time, digital technology helps to build a more diverse library of teaching resources. Utilizing big data and artificial intelligence technology to integrate high-quality Chinese language education resources worldwide, forming a learning system that covers all aspects of listening, speaking, reading, and writing.

3.2 Potential Challenges of Applying Digital Technology in the Field of Education

3.2.1 Data privacy and security risks

In the process of intelligent teaching, educational platforms and related smart devices will collect and store student data, including learning behavior, academic performance, and personal learning preferences. If there is a lack of a comprehensive privacy protection system, these data may face risks of leakage and abuse. If education platforms cannot effectively anonymize or encrypt user data, it will pose significant compliance risks. Therefore, it is necessary for relevant departments to strengthen privacy protection: (1) Establish a systematic privacy management system to standardize the entire data processing process; (2) Implement strict access control mechanisms, clarify data usage permissions and access conditions; (3) Build a multi-level data security protection system to reduce the probability and risk of educational data leakage.

3.2.2 Unequal access to technology and resource allocation

The digital divide also highlights the differences between regions and groups. There is a structural gap in technological infrastructure between developed and developing countries, with low

network coverage and insufficient hardware equipment configuration in some areas. There is also a shortage of virtual reality devices and low broadband network access, which can make it difficult for students to obtain immersive Chinese language learning experiences. At the same time, the technological adaptability of educational subjects is also a limiting factor. The teacher community is facing the skill challenge of operating and maintaining artificial intelligence educational tools, while students need to complete the transition from passive receptive learning to autonomous inquiry based learning mode. Some teachers often find it difficult to effectively integrate intelligent teaching tools due to the limitations of digital literacy, and students' dependence on traditional classroom teaching may lead to adaptive barriers to personalized learning platforms.

4. Path Optimization of Digital Intelligence Technology in Personalized Learning

Technologies such as artificial intelligence, cloud computing, and big data analysis have become effective means of promoting efficient collaboration and optimizing resource allocation among multiple subjects in international Chinese language education, and have become important engines for the high-quality development of disciplines and directions for improving quality and efficiency [13]. Through these advanced technologies, educators can design customized learning plans for students, thereby effectively improving learning outcomes. In the field of international Chinese language education, the application of digital intelligence technology is mainly reflected in the following five dimensions.

4.1 Construction and Optimization of Learner Profile

Learner profiling is based on collecting various student learning data, using data analysis and presentation techniques to extract learner features from various data and label them, thereby characterizing a learner model that contains more complete information [14]. These portraits cover multiple aspects, such as cognitive level, learning style, interests and abilities, and can comprehensively and objectively reflect students' learning status and needs. Building a student profile is a systematic process that mainly involves three stages: data collection, data analysis, and profile formation.

Building a student profile is the first step in establishing a personalized learning path. By collecting and analyzing students' personal information, study habits, knowledge mastery, interests and hobbies, digital technology can create detailed student imaging. These portraits help educators better understand the unique needs and preferences of each student, providing them with more accurate learning content and methods. By constructing student portraits, teachers can gain a more comprehensive understanding of students' learning needs, thereby providing more accurate and personalized teaching.

4.2 Dynamic Recommendation of Personalized Learning Resources

Personalized learning, as a student-centered educational model, can provide suitable learning content based on individual differences such as students' cognition, ability level, and learning preferences. The implementation process of personalized learning resource recommendation system usually includes the following steps: (1) collecting and processing students' historical behavior data and learning resource data; (2) Building and updating user profiles and learning resources; (3) Build and optimize corresponding recommended resources based on machine learning algorithms. In terms of personalized learning resource recommendations, students' needs exhibit diversity and dynamic changes. Specifically, students require recommendation systems to accurately match resources that match their current knowledge status and interest preferences, in order to improve knowledge acquisition efficiency; We also hope that the system can maintain the diversity and novelty of resource recommendations, thereby expanding cognition and stimulating learning motivation. Therefore, personalized learning resource recommendation systems should be able to accurately capture changes in students' needs and provide timely learning resources that meet their expectations. Wang Chunhua pointed out that teachers should actively initiate discussion topics, guide and motivate students to communicate with each other, and clarify task completion standards [14]. For outstanding students, teachers should provide targeted learning advice to meet their learning needs and encourage their active participation; For diligent but sometimes ineffective students, teachers should set standards for task completion and

recognize students' innovative thinking; For students with weak self-discipline, teachers need to invest more time and energy in monitoring their learning progress and reminding them when necessary.

4.3 Multi Modal Evaluation of Learning Progress and effectiveness

Digital intelligence technology can achieve real-time monitoring and evaluation of students' learning process. By analyzing the behavioral data, assessment results, and task completion status generated by students during the teaching interaction process, the intelligent system can accurately identify students' knowledge weaknesses and provide targeted learning guidance and personalized suggestions. Teachers can use big data and artificial intelligence to automatically collect data and monitor the teaching process. They can combine user behavior data, subjective evaluation data, and other factors to build a complete evaluation system and feedback mechanism. At the same time, teachers can use formative evaluation methods to continuously monitor and analyze data, identify problems in a timely manner, and continuously improve the educational effectiveness and user satisfaction of the recommendation system.

4.4 Intelligent Monitoring of Learning Behavior and Performance

Educational monitoring and evaluation is an activity that uses comprehensive and objective data to measure the quality of education, serve the improvement of educational and teaching practices, and lead the high-quality development of education [15]. Under the premise of deep integration of synchronous evaluation and learning process, educational monitoring and evaluation methods are undergoing a transformation from result oriented summative evaluation to a comprehensive evaluation system that integrates learning objectives, processes, and outcomes. With the transformation of evaluation methods from traditional paper and pen testing to digital evaluation, the process data generated during the evaluation process can be collected and stored through the system. The unique advantages of these dynamic, multi-level, and objective process data provide support for the transformation of educational monitoring and evaluation from stage based summative evaluation to multi-dimensional data-driven full

process evaluation. The application of digital intelligence technology creates technical feasibility for constructing personalized learning paths by collecting and analyzing students' behavioral performance data during the learning process. By analyzing data on learning behavior and performance, teachers can determine students' learning preferences, strengths, and weaknesses, and then customize learning paths that better meet their needs and abilities. This data-driven personalized learning path construction not only significantly improves learning efficiency, but also enhances students' self-efficacy and intrinsic motivation.

4.5 Implementation of Intelligent Tutoring and Feedback Mechanism

Educational evaluation, as one of the important elements of educational reform, plays a crucial guiding role in teaching content, teaching methods, and organizational forms. The prerequisite for achieving individual development is to have a comprehensive understanding of the learning situation and implement education that is suitable for individual development. The scientificity of the process of educational evaluation is related to the reliability and credibility of educational evaluation results, and also affects the effectiveness of evaluation [16]. In the context of digital transformation, the education evaluation system provides a scientific basis for implementing precision teaching by integrating the three in one evaluation paradigm of diagnostic evaluation, formative evaluation, and summative evaluation. Intelligent tutoring and feedback mechanisms are an indispensable part of personalized learning paths. Artificial intelligence based educational technology can achieve real-time monitoring and intervention of the teaching process. Teachers can collect multimodal data on students' cognitive, emotional, and behavioral dimensions through this technology, which not only effectively avoids the limitations of subjectivity and one sidedness in traditional assessments, but also achieves multidimensional evaluation of students' learning processes through learning analysis technology.

5. Empirical Research and Data Analysis

5.1 Research Design and Sample Selection

This study focuses on international Chinese

language education students and uses a stratified random sampling method to select 130 participants for a questionnaire survey. The author comprehensively considered variables such as the subjects' learning needs, professional background knowledge, and learning preferences in designing the questionnaire content to ensure that the sample has sufficient diversity and representativeness. Based on questionnaire survey data, this study focused on extracting five questions with significant discriminant validity and their feedback results (see Table 2 for details).

5.2 Research Results and Discussion

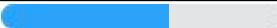
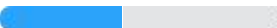
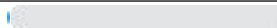
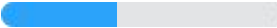
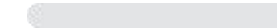
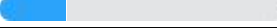
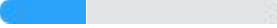
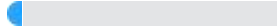
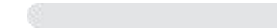
The survey results show that 59.23% of respondents have been exposed to Chinese educational resources supported by digital technology, indicating that such technology has been applied to a certain extent, but there is still a large space for popularization. In terms of commonly used tools, language learning and online teaching platforms have a relatively high usage rate, accounting for 53.08% and 56.92% respectively, while the utilization rate of AI voice interaction tools is relatively low (23.85%), which may be related to their strong functional specialization or insufficient popularity. In addition, the utilization rate of intelligent writing correction workers is 43.08%, reflecting learners' dependence on technical tools in writing assistance. Regarding the role of digital intelligence technology in personalized learning, it is worth noting that only 33.08% of respondents believe that these tools can provide personalized learning recommendations, indicating that there is still room for improvement in current technology in accurately adapting to learners' needs. In terms of future demand, 63.08% of respondents hope that digital technology can provide visual analysis of learning progress, 60% of respondents prefer real-time learning feedback and error correction functions, and the demand for cross-cultural communication scenario simulation is relatively low (41.54%). In addition, the majority of respondents hold a positive attitude towards the effectiveness of digital technology, with 63.85% stating that it is "very useful" or "somewhat useful", and only 5.38% stating that it is "not very helpful", with no one choosing "not helpful".

According to the results, digital intelligence technology has demonstrated high practicality

and acceptance in international Chinese language education, especially in improving learning efficiency and resource richness. However, the precision of personalized recommendations and the development of cross-cultural communication functions still

need to be strengthened. Future research can further optimize the technological path, combine learner feedback, and focus on improving adaptive recommendation and real-time feedback functions to better meet personalized learning needs.

Table 2. Selected Questionnaire Contents and Results

1. Have you been exposed to international Chinese education courses or resources supported by digital intelligence technology?		
option	subtotal	proportion
yes	77	 59.23%
no	53	 40.77%
Number of valid entries for this question	130	
2. What are the intelligent tools you often use in your study? (Multiple choices)		
option	subtotal	proportion
Language learning apps (such as HelloChinese and Duolingo)	69	 53.08%
Intelligent writing correction tools (such as Grammarly Chinese edition)	56	 43.08%
Online teaching platform (such as Yu Classroom, Zhihuishu)	74	 56.92%
AI voice interaction tools (such as iFLYTEK Yuwan)	31	 23.85%
other	7	 5.38%
Number of valid entries for this question	130	
3. In what aspects do you think these tools are helpful for personalized learning?		
option	subtotal	proportion
Improve interest in learning	66	 50.77%
Improve learning efficiency	88	 67.69%
Learning resources are abundant	76	 58.46%
Provide personalized learning suggestions	43	 33.08%
other	1	 0.77%
Number of valid entries for this question	130	
4. In what aspects do you want digital intelligence technology to provide more personalized support? (Multiple choices)		
Adaptive learning content recommendation	65	 50%
Real-time learning feedback and error correction	78	 60%
Visual analysis of learning progress	82	 63.08%
Cross-cultural communication scenario simulation	54	 41.54%
other	0	 0%
Number of valid entries for this question	130	
5. Do you think intelligent technology is helpful for Chinese learning?		
very useful	31	 23.85%
More useful	52	 40%
commonly	40	 30.77%
Not very helpful	7	 5.38%
No help	0	 0%
Number of valid entries for this question	130	

5.3 Validity Analysis of Results

In this study, we conducted factor analysis on the validity of the questionnaire (as shown in Table 3) to explore the application of digital

intelligence technology in international Chinese language education and its impact on learning.

In this study, we conducted factor analysis on questionnaire data to explore the potential relationships and structures between different

variables. The results showed that four factors were extracted, which could effectively explain the variability of various indicators in the questionnaire. The eigenvalue of factor 1 is 1.58, and the variance explained by rotation is 19.78%, indicating that this factor is mainly related to “support for AI teacher dual dominant teaching mode” and “willingness to generate personal learning profiles through AI”. This indicates that the respondents have a positive attitude towards the application of new technologies in personalized learning. The eigenvalue of factor 2 is 1.19, and the variance explained by rotation is 14.89%. This factor is mainly related to the international Chinese language education curriculum supported by digital technology, reflecting the respondents’ views on the application of digital technology in education, especially their thoughts on its effectiveness and necessity. The eigenvalue of factor 3 is also 1.19, and the variance explained by rotation is 14.84%.

This factor is highly correlated with the question of “how do we hope teachers can participate in personalized learning driven by digital intelligence technology”, indicating the respondents’ expectations for the role of teachers in the new technological environment. The eigenvalue of factor 4 is 1.10, and the variance explained by rotation is 13.74%. This factor is mainly related to the belief that digital technology can help with Chinese language learning, indicating that respondents generally believe that digital technology has a positive role in the learning process. From the perspective of commonality, all items have a commonality of 0.5 or above, indicating a strong correlation between most variables and the extracted factors. The KMO value is 0.504, indicating that the sample is suitable for factor analysis; The p-value of the Bart sphericity test is 0.001, further confirming the suitability of the data.

Table 3. Validity Analysis of Survey Results

subject	factor 1	factor 2	factor 3	factor 4	Communality
1. What is your grade?	-0.17	0.19	0.05	0.84	0.772
2. Have you been exposed to international Chinese education courses or resources supported by digital intelligence technologies?	0.26	-0.72	0.11	-0.18	0.627
3. Do you think digital intelligence technology is helpful for Chinese learning?	0.56	-0.27	-0.07	0.54	0.676
4. Are you willing to generate a personal learning portrait through AI?	0.74	-0.13	-0.09	-0.23	0.622
5. Which language skills do you think current technology is most effective in improving?	0.25	0.69	0.09	-0.03	0.540
6. Have you experienced virtual reality (VR)/augmented reality (AR) technology assisted teaching?	0.06	0.11	-0.79	-0.11	0.659
7. How do you want teachers to participate in personalized learning driven by digital intelligence technology?	0.05	0.10	0.72	-0.07	0.530
8. Do you support the teaching mode of “AI + teacher” dual dominance?	0.75	0.24	0.10	0.04	0.634
Root of features (before rotation)	1.62	1.27	1.16	1.00	-
% of Variance(Unrotated)	20.28%	15.89%	14.56%	12.53%	-
Cumulative % of Variance(Unrotated)	20.28%	36.17%	50.73%	63.26%	-
Eigen value(Rotated)	1.58	1.19	1.19	1.10	-
% of Variance(Rotated)	19.78%	14.89%	14.84%	13.74%	-
Cumulative % of Variance(Rotated)	19.78%	34.68%	49.51%	63.26%	-
KMO	0.504				-
Bartlett's Test of Sphericity	55.878				-
df	28.000				-
P value	0.001				-

In summary, the factor analysis results of this questionnaire reveal the different views and

attitudes of respondents towards the application of digital intelligence technology in Chinese

language learning. Future research can further explore the acceptance of digital intelligence technology among students of different grades and its impact on learning outcomes, providing valuable references for educational practice.

6. Conclusion and Prospect

This study explores the application of digital intelligence technology in building personalized learning paths for international Chinese language education, revealing the significant advantages of digital intelligence in improving student engagement, optimizing learning resource recommendations, real-time monitoring of learning progress, comprehensive recording of learning behavior, and providing intelligent tutoring and feedback. The research results not only confirm the effectiveness and feasibility of digital intelligence technology in building personalized learning paths, but also provide strong support for us to further understand and utilize digital intelligence technology to promote innovative development of international Chinese language education. The deep application of digital intelligence technology, especially the integration of emerging technologies such as virtual reality (VR) and augmented reality (AR), is reshaping the teaching mode and learning experience of Chinese language education, which can be further strengthened in the future. In the future, with the further development of technologies such as 5G and artificial intelligence, international Chinese language education will achieve a higher degree of intelligence and personalization. Digital technology will become a bridge connecting Chinese language students worldwide, promoting the international dissemination of Chinese culture and contributing to the construction of a community with a shared future for mankind.

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References

- [1] Ni Minjing Humanity will enter the stage of super learning. *Contemporary Educator*, 2024 (5)
- [2] Lu Yongli, Liang Huapei, Li Yuxin Identifying, nurturing, and evaluating talents: innovative development based on individualized teaching . *People's Education*, 2023 (Z3)
- [3] Cheng Shangrong Teaching students according to their aptitude: the first principle of cultivating top-notch innovative talents. *Primary and Secondary School Management*, 2024, (01):63.
- [4] Zhu Ke, Wang Jianming The Five Logic of Empowering Education Power Construction with Digital Intelligence Technology. *Modern Educational Technology*, 2025, 35 (01): 15-24
- [5] Mao Yufei, Hu Wenxin, Zeng Xiangquan How does the application of digital technology affect the innovation performance of human resources practitioners? *Economic Management*, 2024, 46 (12): 81-103
- [6] Li Haijian, Li Zhenzhen The impact of digital transformation on high-quality development and high-speed growth of enterprises: a test based on the perspective of “quality change, efficiency change, and power change”. *China Rural Economy*, 2024

- (4): 120-140
- [7] Wang Juan, Yu Zhenghong, Lin Weiyu Empowering University Teaching Reform with Digital Intelligence Technology: Value Implications, Application Scenarios, and Practical Paths. *Lifelong Education Research*, 2025, 36 (2): 38-46
- [8] Yu Yingli, Han Liying, Wang Zhenglu The Value, Connotation, and Path of Empowering Basic Education Modernization with Digital Intelligence Technology. *Shanghai Education Evaluation Research*, 2024, 13 (06): 8-12
- [9] Shen Shusheng Empowering Education Transformation with Digital Intelligence: Building Practical Styles that Adapt to Social Development. *Research on Electronic Education*, 2025 (2)
- [10] Zhang Jing The Limits and Paths of Digitization Empowering High Quality Development of Education. *Heilongjiang Higher Education Research*, 2025, 43 (02): 17-22
- [11] Cao Xianwen, Chen Hong, Chen Nuo, etc International Chinese Language Education in the Age of Digital Intelligence: Change and Unchanged. *Language Teaching and Research*, 2024, (03):1-19.
- [12] Liu Bing, Zheng Yanqin Diversified Development of International Chinese Language Education Programs: Innovative Models and Practical Paths. *Journal of Tianjin Normal University (Social Sciences Edition)*, 2024, (06):17-24.
- [13] Li Baogui, Li Hui The Core and Boundary of International Chinese Language Education Discipline in the Era of Digital Intelligence. *Chinese Language Learning*, 2024, (06):78-86.
- [14] Wang Chunhua Research on Precise Teaching Intervention Based on Learner Profile. *Journal of Jinan University (Social Sciences Edition)*, 2023, 33 (02): 136-146
- [15] Tan Huiling, Zhang Han Realistic Reflection and Path Optimization of Education Monitoring and Evaluation Based on Education Improvement. *Chinese Journal of Education*, 2024, (11):41-47.
- [16] Li Guanghai, Shi Limin, Gan Peng The Value Shift and Implementation of Basic Education Evaluation under the Background of Modernization of Education in China. *Modern Education Management*, 2025 (3): 12-22.