ISSN: 2710-0170

Practical Reflections and Application Value of AI Adaptive Learning in the Acquisition of Chinese as a Second Language

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Abstract

The digital transformation of education continues to advance, with artificial intelligence and adaptive technologies gradually integrating into teaching scenarios for Chinese as a foreign language, offering innovative pathways to transform traditional, rigid second-language instruction models. Currently, universities in China and socialized Chinese language education institutions generally adopt standardized, large-scale classroom instruction. Uniform curricula and fixed teaching paces struggle to meet the personalized development needs of foreign learners from diverse linguistic backgrounds and varying proficiency levels. While standardized models suit large-scale educational management systems, they overlook the individual differences inherent in second-language acquisition, thereby constraining long-term improvements in learners' overall Chinese competence and limiting further advancements in the quality of Chinese language teaching. Grounded in Krashen's second-language acquisition theory and the input hypothesis, this paper systematically analyzes the application value of AI-driven adaptive learning in Chinese second-language acquisition, drawing on practical experiences from frontline teaching. It identifies multidimensional real-world challenges in implementing intelligent teaching technologies, focusing on four key areas: technological compatibility, integration between pedagogy and technology, teacher and student digital literacy, and assessment systems. AI-adaptive learning can precisely match diverse learner profiles, optimize Chinese language competency development frameworks, and reconstruct an intelligent classroom ecosystem. However, current practices often suffer from low accuracy in adapting technology to Chinese language contexts, superficial integration of technology and pedagogy, insufficient digital literacy among teachers and students, and overly simplistic or rigid evaluation mechanisms. To effectively address these challenges and fully unlock the educational potential of intelligent technologies, this study proposes a multi-dimensional optimization strategy based on authentic classroom settings in Chinese language teaching. The strategy includes four core directions: iterative refinement of specialized Chinese language technologies, deep integration of teaching and technology, systematic development of teacher and student digital competencies, and enhancement of diversified assessment mechanisms. This research offers practical insights for the routine integration of intelligent teaching models into Chinese language education and contributes to the high-quality development of international Chinese language education.

Keywords

AI adaptive learning; second language acquisition (SLA); Chinese-teaching; Individualized learning; Teaching practice.

1. Introduction

There are fundamental differences in acquisition logic between second language acquisition and the natural acquisition of the native language. Native language acquisition is accomplished

ISSN: 2710-0170

within an immersive native language environment and is a subconscious, passive process of internalization of language. Second language learners' acquisition scenarios have limitations, with the core learning scenarios concentrated in classroom teaching. Foreign language learners generally lack real-life Chinese communication contexts outside of class, and their language proficiency advancement mainly relies on active knowledge accumulation, systematic deliberate practice, and regular review and summary. From classroom teaching practice, there are many common acquisition difficulties for foreign language Chinese learners. Negative transfer of the native language, scarcity of real-life communication resources, and a long period for cultivating language sense are the main factors restricting the effectiveness of second language acquisition. Even in a classroom environment with unified teaching resources and synchronized teaching rhythms, the proficiency levels of learners in Chinese still show significant stratification, and the differentiation characteristics of learning situations are quite prominent [1].

The global popularization of international Chinese education has continuously expanded the scope of Chinese learners. The age structure, national background, and learning motivations of learners present diversified characteristics. Some learners focus on cultivating daily cross-cultural communication skills, some on preparing for the HSK standardized grade examination, and some on learning Chinese based on career application needs. The traditional homogeneous teaching mode is no longer suitable for the differentiated cultivation demands of diverse learning situations. The artificial intelligence adaptive technology provides a new technical carrier for the reform of individualized teaching in foreign Chinese. Based on core technologies such as big data collection and analysis, natural language processing, the AI system can dynamically capture the entire learning behavior data of learners, accurately identify knowledge gaps and ability deficiencies, and generate personalized acquisition plans tailored to individual characteristics. The intelligent teaching mode has the advantages of precise education that traditional classrooms do not possess, but it also has obvious shortcomings in the adaptation level of Chinese teaching scenarios. This article combines basic theories and teaching practices to systematically explore the application value, existing dilemmas, and optimization paths of this mode.

2. The core application value of the AI adaptive learning mode in the acquisition of second language Chinese

2.1. Adapt to the differences in chemistry concepts and solve the problem of homogeneous teaching

Individualized learning situations are the core feature of second language teaching in Chinese as a foreign language. The standardized collective teaching model is unable to fully meet the individualized acquisition needs of learners. There are fundamental differences in the native language systems of learners from different countries, and their language thinking logic varies. The key difficulties and focuses in Chinese acquisition show distinct national characteristics. European and American learners have long used the phonetic writing system, which lacks a cognitive foundation for the Chinese tone system and the structure of square Chinese characters. Confusion of tones and difficulty in memorizing characters are the main acquisition obstacles for them during the initial stage. Southeast Asian learners have a cognitive foundation for pictographic writing, and the difficulty in reading Chinese characters is relatively low. However, they commonly have frequent acquisition problems such as incorrect use of auxiliary words, disorder in word order, and omissions in grammar details [2].

The differentiation of acquisition goals further widens the gap in learners' ability levels. Test-oriented learners focus on accumulating grammatical knowledge and specialized training of question types, while practical-oriented learners focus on oral expression and scenario-based

ISSN: 2710-0170

communication practice. Unified classroom teaching content cannot be adapted to the core learning demands of both groups in a two-way manner. Personalized and precise adaptation is the core teaching advantage of AI adaptive learning. Systematically integrating test results, classroom performance, and after-class training data from multiple dimensions of learning situations, an exclusive electronic learning situation archive is constructed for learners, precisely identifying individual ability weaknesses and dynamically adjusting training difficulty and adaptive learning resources. This model can lay a solid foundation of core basic knowledge for learners with zero proficiency and provide expansionary learning content for advanced learners. Pilot classroom practice data shows that the differentiated adaptation mechanism can effectively narrow the class learning situation gap, ensure that learners of all levels adapt to their own acquisition rhythm, and steadily improve the efficiency of second language acquisition [3].

2.2. Empower multi-dimensional ability cultivation and improve the second language acquisition system

There is a significant imbalance in the teaching structure of traditional Chinese as a foreign language classes. The teaching focus is mainly on the imparting of theoretical knowledge and the training of written exercises, while the cultivation of practical language skills has long been neglected. The limited class time allocation, insufficient teacher resources, and shortage of real-life training resources are the main objective constraints for the implementation of practical teaching. Emphasizing theory and neglecting practice have become the regular situation in traditional second language teaching. Most international students have a solid foundation of written knowledge and perform well in exam results, but they often encounter difficulties in oral expression, stammering in communication, and a disconnect between learning and application in real communication scenarios.

The AI adaptive teaching system can effectively fill the shortcomings of practical training in traditional classrooms. The high-precision speech recognition module on the platform can monitor the pronunciation deviations and tone errors of learners in real time, enabling immediate correction and feedback, breaking through the traditional lagging teaching feedback and inability to cover all students' needs. Regular AI oral language specialized training can significantly improve the learners' pronunciation standardization and tone accuracy. The system builds a multi-scenario virtual communication training platform, covering various scenarios such as daily life, campus interaction, business communication, and cross-cultural communication, breaking the time and space limitations and providing learners with a 24/7 immersive language training channel [4]. The training content integrates Chinese and foreign cross-cultural knowledge, breaking away from the single training mode of mechanical practice, and simultaneously cultivating learners' language application ability and cross-cultural communication literacy, further improving the comprehensive cultivation system for second language acquisition.

2.3. Two-way reduction of burdens and improvement of efficiency, optimization of the overall teaching ecosystem

The foreign Chinese language teaching system involves a large amount of repetitive and routine basic work. Tasks such as homework grading, error statistics, student situation analysis, and student file updates consume a significant amount of teachers' after-school research and teaching time. College teachers of foreign Chinese language are responsible for multiple tasks including teaching, research, and student management. The time allocated for curriculum optimization, personalized tutoring, and teaching innovation is greatly reduced, making it difficult to implement individualized teaching based on students' characteristics on a large scale in the classroom [5].

ISSN: 2710-0170

The AI adaptive learning model can achieve mutual reduction of teachers' and students' burdens and improvement of teaching quality and efficiency. The intelligent system can autonomously complete various mechanical teaching tasks, quickly generate class situation analysis reports, precisely sort out common problems in the class and students' individual ability deficiencies, and provide reliable data support for teaching design and precise answering. Teachers can free themselves from the cumbersome routine work and focus on optimizing the curriculum system and cultivating students' comprehensive literacy. Intelligent teaching breaks the constraints of classroom time and space, providing customized learning plans for learners, avoiding inefficient learning behaviors such as blindly practicing and ineffective exercises. The gradient learning content combined with immediate positive feedback effectively alleviates learners' fear of second language acquisition, guiding students to establish good learning habits of independent exploration and regular review, and building a sustainable and positive classroom teaching ecosystem [6].

3. The practical challenges of the AI adaptive learning model in the acquisition of second language Chinese

3.1. The technical adaptation for the specific Chinese language is not precise enough

The mainstream intelligent teaching algorithms currently available in the market are mostly developed based on the phonetic language system. Their core technical logic is adapted to the characteristics of alphabetic language, but they have not specifically optimized for the unique language features of Chinese such as tone differentiation, block character shapes, flexible word order, and flexible use of auxiliary words. The Chinese language structure is intricate and complex, and there are higher technical requirements for intelligent recognition accuracy and the delicacy of semantic discrimination. This is the core technical bottleneck that current intelligent Chinese teaching is unable to overcome.

From the perspective of practical classroom application effects, the defect of the AI system in adapting to Chinese language scenarios is particularly prominent. The speech recognition module has difficulty accurately distinguishing subtle pronunciation differences such as neutral tone, devoiced tone, and tone change, and errors in correction, omission, and misjudgment occur frequently. The text recognition module has insufficient accuracy in recognizing complex Chinese characters, similar-looking Chinese characters, and their shapes and strokes. Regular errors in judgment occur [7]. The training focus of the existing algorithms is on knowledge point memorization and written exercise training, while there is a lack of corresponding technical support for implicit learning dimensions such as language sense cultivation, context adaptation, and cross-cultural interpretation. These technical defects have given rise to significant learning contradictions. Learners' test scores can steadily improve, but their real-life communication ability and comprehensive language literacy are difficult to achieve effective breakthroughs, and the core educational value of intelligent technology cannot be fully released.

3.2. The superficial integration of teaching and technology, and the disconnection between supply and demand

Most educational institutions face problems in the formalization of AI technology application. The intelligent tools are only used as basic auxiliary devices and have not been deeply integrated into the overall teaching system. The application of technology is disconnected from classroom teaching, and the degree of integration is seriously insufficient. Most institutions only activate basic functions such as assignment distribution and automatic grading. Core functions such as learning situation diagnosis, personalized resource push, and tiered

ISSN: 2710-0170

specialized training remain idle for a long time. The intelligent technology cannot cover the complete teaching loop of before-class, during-class, and after-class [8].

The learning resources automatically pushed by the intelligent platform have a low matching degree with the core key points of the textbooks and the core content of classroom teaching. The utilization rate of teaching resources is insufficient, resulting in a significant phenomenon of teaching supply and demand imbalance. Data from frontline teaching research shows that most teachers' AI applications are limited to the consolidation of homework after class. Rarely do they rely on intelligent learning situation data to adjust teaching key points, nor do they combine intelligent resources to optimize teaching design. The shallow application of technology cannot build a complete teaching loop, leading to the personalized and precise teaching advantages of AI adaptive learning being merely formalized and unable to truly empower the improvement and efficiency enhancement of classroom teaching.

3.3. Teachers' professional qualities lag behind technological advancements

The implementation effectiveness of intelligent teaching technologies depends on the intelligent application literacy of teachers and students. Intelligent technologies update at a relatively fast pace, while the practical operation ability and application cognition of the teacher and student groups generally lag behind the pace of technological development. "New technologies, traditionalized applications" have become a common situation in intelligent classrooms. Some senior teachers have fixed teaching thinking and have long relied on traditional teaching methods to conduct teaching. They only have basic operation skills in AI, and have weak abilities in advanced applications such as learning situation data analysis, intelligent resource integration, and differentiated teaching design. They are unable to fully tap the teaching potential of intelligent technologies.

The autonomous learning awareness of foreign learners is generally weak, and they have long adapted to the passive mode of receiving classroom knowledge. Students mostly complete mandatory AI learning tasks passively, and there are few autonomous learning behaviors such as active research, identifying and filling gaps, and reviewing mistakes. Long-term classroom observation data shows that only a few highly active learners can rely on AI tools to carry out targeted training to strengthen their weaknesses [9]. The lack of overall intelligent literacy of teachers and students reduces the teaching conversion efficiency of intelligent technologies and restricts the large-scale promotion and application of intelligent teaching models.

3.4. The teaching evaluation system is monotonous and rigid

Teaching evaluation is the core tool for adjusting teaching direction and improving the quality of second language acquisition. Currently, the evaluation mechanism suitable for intelligent Chinese teaching is relatively rigid. The existing evaluation system heavily relies on end-of-term tests, correct rates of homework, and other terminal quantitative indicators. The single score-based evaluation standard cannot adapt to the dynamic and progressive growth characteristics of second language acquisition [10].

The comprehensive effectiveness of Chinese second language acquisition covers multiple evaluation dimensions. Oral expression ability, language sense cultivation, communication application level, and cross-cultural cognitive ability are all core components of the acquisition results. They have long been excluded from the mainstream evaluation system. Process-based evaluation indicators such as the quality of error correction, classroom participation degree, and self-study commitment have not yet formed a standardized evaluation mechanism. The and rigid evaluation system cannot objectively reflect the comprehensive Chinese literacy of learners, cannot provide precise data support for teaching optimization and technological iteration, and continuously restricts the improvement space of intelligent teaching quality.

ISSN: 2710-0170

4. The AI adaptive learning mode enables the optimization of practical paths for second language Chinese acquisition

4.1. Optimize the specialized algorithms of Chinese language and enhance the technical adaptability

To break through the technical bottlenecks in intelligent Chinese language teaching, it is necessary to break the inherent framework of the pinyin language algorithm and promote the localization and iterative upgrade of Chinese-specific algorithms [11]. The technological research and development should be in line with the cognitive laws of second language acquisition, focus on optimizing and upgrading the functions of the most frequently taught difficult points in teaching Chinese as a foreign language, and particularly improve the core modules such as the identification of subtle phonetic differences, the discrimination of complex characters, and the distinction of similar characters, to reduce the system's recognition errors and provide learners with precise error correction guidance and specialized training resources.

Based on the HSK level classification standard and combined with the acquisition characteristics of learners from different countries, build a classified and country-specific exclusive Chinese resource library, which is suitable for the individualized acquisition needs of learners at different levels such as zero foundation, advanced, and high-level [12]. Abandon the fixed training mode of simply doing exercises, upgrade the core functional modules such as real-life communication, context application, and cross-cultural experience, promote AI teaching to shift from the orientation of test score improvement to the orientation of cultivating comprehensive language abilities, and achieve the two-way transformation of theoretical knowledge and practical language ability.

4.2. Deepen the integration of teaching and technology, and build a closed-loop teaching system

Overcoming the practical challenges of fragmented teaching techniques and formalized empowerment is the core key to the normalization of intelligent teaching. Promoting the full coverage of intelligent technologies throughout the entire teaching process and building an integrated intelligent teaching loop. In the pre-class preparation stage, relying on the AI learning situation diagnosis function, sort out the common learning problems of the class and the individual learning deficiencies of students, and formulate a scientific and stratified teaching plan.

During the classroom teaching stage, retrieve real-time learning situation data, precisely break down the key and difficult points of teaching, respond to the common questions and individual confusion of students in a targeted manner, and fully implement the teaching concept of individualized education. In the post-class consolidation stage, based on the learning effectiveness in class, layer-wise push back-to-correction of mistakes, special training, and extended learning resources, ensuring that the intelligent resources are highly consistent with the textbook content, teaching progress, and teaching schedule. The full integration of technology throughout the process can completely eliminate the formalized empowerment of technology and fully release the precise educational advantages of intelligent teaching [13].

4.3. Nurture students' character and lay a solid foundation for application

Establishing a regular teacher character cultivation mechanism is the fundamental support for the long-term implementation of intelligent teaching. Conducting specialized intelligent teaching training for teachers of foreign language Chinese, focusing on cultivating three core abilities: data analysis of student situations, intelligent resource integration, and hierarchical teaching design. This aims to break through the constraints of traditional teaching thinking,

ISSN: 2710-0170

establish a modern teaching concept based on data and intelligence, and comprehensively enhance the practical application level of intelligent tools.

Offer lightweight intelligent learning guidance courses for foreign learners, systematically explaining platform operation skills, methods for reviewing mistakes, and strategies for self-directed learning planning. This guides students to actively use intelligent tools to identify weak points in their learning, carry out targeted special training, and cultivate a positive learning habit of independent exploration and steady progress. Achieve simultaneous improvement of both teachers' and students' intelligent literacy, and lay a solid foundation for the regular implementation of intelligent teaching [14].

4.4. Establish a diversified evaluation system to achieve precise education throughout the entire process

Relying on the technical advantage of AI big data for full-process traceability, a diversified and all-round three-dimensional teaching evaluation system is reconstructed. It breaks through the limitation of the sole focus on test scores, integrates process-based evaluation and result-based evaluation, quantitative evaluation and qualitative evaluation, and aligns with the core goal of comprehensive education in second language acquisition.

The system retains basic quantitative indicators such as test scores and homework quality, and adds process-based evaluation dimensions such as learning engagement, efficiency of correcting mistakes, improvement in oral language skills, and classroom participation. It also supplements qualitative evaluation contents such as language application ability, cross-cultural literacy, and learning attitude. Based on multi-dimensional data, personalized growth reports for learners are generated, clarifying the direction of ability advancement. At the same time, it provides precise data support for teaching optimization, algorithm iteration, and offers a virtuous cycle mechanism for teaching implementation, data evaluation, and quality improvement [15].

5. Conclusion

AI adaptive learning provides a brand-new development opportunity for the reform and innovation of second language Chinese teaching, effectively compensating for the multi-dimensional shortcomings of traditional standardized teaching, and precisely adapting to the individualized acquisition needs of learners from various countries and levels. The core teaching advantages of this model include big data learning situation analysis, intelligent algorithm dynamic regulation, realistic training modules, and personalized tutoring mechanisms. It can effectively enhance learners' Chinese communication skills and cross-cultural comprehensive literacy, simplify teachers' repetitive administrative tasks, optimize the overall classroom teaching ecology, and possess extremely high teaching application value.

At present, the implementation practice of intelligent Chinese teaching still has many optimization spaces. Core issues such as insufficient accuracy of technology adaptation for Chinese, insufficient integration of teaching technology, low matching degree of teachers' qualities, and a fixed and single evaluation system are intertwined, directly affecting the actual educational effectiveness of intelligent teaching. The optimization and upgrading of foreign Chinese language intelligent teaching in the future should focus on addressing these core pain points through systematic improvements, iteratively upgrading Chinese-specific intelligent algorithms, deepening the integration of teaching technology throughout the teaching process, building a regular teacher quality cultivation mechanism, and establishing a multi-dimensional and three-dimensional evaluation system. Through comprehensive system optimization, an intelligent teaching model adapted to the acquisition laws of a second language can be

ISSN: 2710-0170

constructed, fully releasing the educational potential of artificial intelligence, and helping international Chinese education achieve high-quality and sustainable development.

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