

Research on Mandarin Teaching and Practice in Higher Vocational Colleges under the Background of Big Data

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Abstract: *With the rapid development of information technology, big data has become a key tool for driving educational innovation and improving teaching quality. In higher vocational colleges, in particular, Mandarin teaching faces dual demands for personalization and efficiency enhancement. This paper explores the current application and future potential of big data technology in the field of higher vocational Mandarin education. It analyzes the main challenges encountered during implementation, such as data privacy and ethical issues, the development of adaptive teaching content, and the need for enhancing teachers' skills. Through specific case analyses, this paper proposes a series of practical strategies aimed at optimizing the teaching process and improving teaching quality.*

Keywords: *Big Data; Higher Vocational Education; Mandarin Teaching; Data Privacy; Adaptive Teaching*

1. Introduction

In the current era of big data, the teaching models in higher vocational colleges are facing unprecedented challenges and opportunities. As a fundamental subject, the quality of Mandarin teaching directly impacts students' language abilities and overall competence. However, traditional teaching methods have limitations in meeting the demands for personalized learning and efficiency improvement. The introduction of big data technology can not only provide in-depth analysis of student learning behaviors but also facilitate the innovation of teaching content and methods. Therefore, researching the application of big data in higher vocational Mandarin education holds significant theoretical and practical value.

2. Background of Research on Mandarin Teaching and Practice in Higher Vocational Colleges under the Background of Big Data

2.1 Application Background of Big Data in Education

In today's society, where information and digitalization are rapidly advancing, big data technology has become a crucial tool for driving educational innovation and enhancing educational quality. The application of big data in the education sector is not limited to data collection and analysis; more importantly, it profoundly impacts educational decision-making, teaching methods, learning outcome evaluation, and resource optimization. By mining and analyzing vast amounts of educational data, educators can gain unprecedented insights into student behavior patterns, learning progress, and effectiveness, thereby achieving personalized and precise teaching. Additionally, big data supports the formulation of educational policies, providing a scientific basis for educational reforms through data-driven analysis, optimizing the allocation of educational resources, and enhancing the overall efficiency of the education system.^[1]

2.2 Potential Value of Big Data in Mandarin Teaching

Mandarin, as the official language of China, plays a crucial role in implementing national language policies and enhancing communication efficiency among citizens. The application of big data technology in Mandarin teaching opens up a new avenue for improving teaching quality and efficiency. By collecting, processing, and analyzing data on students' Mandarin learning, teachers can accurately identify students'

language weaknesses and learning obstacles, and subsequently develop more targeted teaching strategies. For instance, by analyzing students' speech input data, it is possible to pinpoint the accuracy of each syllable's pronunciation, providing personalized pronunciation guidance and improvement suggestions for each student. Furthermore, big data can assist educators in evaluating the effectiveness of teaching content and methods, making teaching adjustments more scientific and timely through the visualization of learning outcomes.

2.3 Importance of Big Data in the Practice of Mandarin Teaching in Higher Vocational Colleges

As vital bases for vocational skill education, higher vocational colleges place significant importance on Mandarin teaching, which not only affects students' future career development but also serves as the foundation for their social communication skills. In this educational context, the application of big data is particularly important. On one hand, big data can help higher vocational colleges construct more scientific Mandarin teaching models by analyzing extensive learning data to identify common issues and individual differences in teaching, thus providing more personalized teaching support. On the other hand, with the increasing demands for language proficiency in the job market, higher vocational colleges can better adjust their curriculum to align with vocational needs by analyzing students' language usage through big data, thereby enhancing the relevance and practicality of education. Additionally, big data can aid in modernizing teaching management by driving data-based teaching evaluation and quality control, improving the transparency and fairness of teaching activities, and effectively enhancing the overall quality of educational services.^[2]

3. New Challenges in Mandarin Teaching and Practice in Higher Vocational Colleges in the Era of Big Data

In the context of the big data era, Mandarin teaching and practice in higher vocational colleges face a series of new challenges and opportunities. With the rapid development of information technology, the utilization of data in the education sector has deepened, bringing profound changes to traditional teaching methods. However, this technological advancement also raises various issues and difficulties, particularly in areas such as data privacy and ethical use, the development of adaptive teaching content, the enhancement of teachers' skills, and student engagement. These challenges test educational institutions' ability to apply new technologies and balance the dual goals of protecting student rights and improving teaching quality. Faced with these challenges, higher vocational colleges need to innovate teaching strategies, optimize the allocation of educational resources, and continuously enhance teachers' professional skills to adapt to this data-driven new educational environment.

3.1 Data Privacy and Ethical Challenges

With the widespread application of big data technology in education, data privacy and ethical issues have become significant challenges. In promoting Mandarin teaching, higher vocational colleges face the crucial responsibility of protecting students' personal information. The security of student data is not only a matter of personal privacy but also involves broader aspects of information security. Educational institutions must prevent sensitive data from being accessed or misused by unauthorized third parties, a risk that is particularly prominent in a digital teaching environment.

Additionally, ethical issues are equally important in the application of big data. Educators must maintain transparency in data usage and ensure fairness in data processing when using student data for teaching improvement and research. Misuse of data can lead to unfair treatment of students or biased teaching decisions, negatively affecting students' learning experiences and development. Ensuring the fair use of data is an ethical responsibility that educational institutions must address when adopting new technologies.

In practice, balancing technological innovation with the protection of personal privacy is a complex issue that higher vocational colleges must resolve when adopting big data technology. Schools need to fully utilize educational technology while strictly monitoring and controlling data flows at every step, ensuring that all educational activities comply with ethical standards and legal requirements. This challenge requires educational institutions to continuously update their data management policies to adapt to the ever-changing technological and regulatory environment.^[3]

3.2 Challenges in Developing Adaptive Teaching Content

In the era of big data, developing teaching content that can adapt to various learning needs is a significant challenge for higher vocational colleges. Teaching content needs to dynamically adjust according to students' learning progress and comprehension levels, ensuring that each student can learn at a pace that suits them best. This personalized learning approach requires that teaching materials not only include a rich variety of educational resources but also possess high adaptability and flexibility.

Furthermore, achieving this dynamic adaptive teaching model relies on advanced educational technology and complex data analysis systems. Educational technology experts and curriculum designers must collaborate to develop intelligent teaching systems that can analyze student learning data in real-time. Developing and maintaining such systems require ongoing technical support and professional expertise to ensure their effectiveness and the real-time updating of teaching content.

However, given the rapid technological development and the diverse needs of students, ensuring that teaching content meets the demands of big data analysis while maintaining inclusivity and diversity becomes another major challenge. Curriculum design needs continuous innovation to adapt to the ever-changing teaching environment and the specific needs of student groups, which undoubtedly increases the complexity and challenges of developing teaching content.

3.3 Teacher Skill Enhancement and Adaptation to Big Data

As big data technology is widely applied in education, teachers face the challenge of needing to enhance their skills to adapt to new technologies. In Mandarin teaching in higher vocational colleges, teachers must not only master traditional teaching methods but also understand and utilize big data technology to analyze and optimize students' learning processes. This skill transition requires teachers to be proficient in curriculum content and possess data analysis and interpretation skills to adjust teaching strategies based on data feedback.

Moreover, teachers need to adapt to the rapidly changing educational technology environment. With the fast development of online teaching platforms and tools, teachers must be able to flexibly use these new tools for teaching. This not only improves teaching efficiency and effectiveness but also makes teaching methods more diverse and personalized. However, this enhancement in technological adaptability poses a significant challenge for many teachers, especially those accustomed to traditional teaching methods.^[4]

Lastly, the continuous professional development of teachers remains an ongoing challenge. To keep pace with educational technology developments, teachers need to constantly update their knowledge and skills. This includes technical training and learning strategies for effectively integrating new technologies into teaching. Continuous learning and development for teachers are crucial for improving teaching quality and adapting to new educational trends, but it is also a challenging task.

3.4 Low Student Engagement and Acceptance

In the practice of Mandarin teaching in higher vocational colleges, student engagement and acceptance often pose challenges. Although the personalized learning paths and rich teaching resources provided by the era of big data theoretically enhance students' learning initiative, it is often found in practice that students lack sufficient motivation to utilize these resources. Students may resist learning suggestions generated from big data analysis or feel isolated due to overly personalized teaching content, leading to low engagement.

The application of big data technology in Mandarin teaching requires students to have a certain level of technological adaptability. Although most students are relatively familiar with digital technology, the complexity of learning management systems or data analysis tools can affect their learning experience and willingness to participate. Educational institutions need to ensure that technological solutions are not only efficient but also user-friendly to reduce students' psychological barriers to technology use.

While big data allows for personalized adjustments in teaching according to students' specific needs, such a highly personalized learning environment can lead to social isolation among students. In Mandarin teaching, the lack of sufficient interaction and collaborative learning opportunities may make students feel isolated, affecting their learning motivation and overall learning outcomes. Therefore, how to maintain social dynamics and group participation in the classroom while achieving personalized learning is a significant challenge that needs to be addressed in the application of big data.^[5]

4. Strategies for Mandarin Teaching and Practice in Higher Vocational Colleges in the Era of Big Data

In the context of the big data era, Mandarin teaching and practice in higher vocational colleges must actively respond to the challenges posed by a data-driven educational environment. To this end, a series of strategies need to be developed to optimize teaching practices, enhance both teachers' and students' data skills, and ensure data security and ethical use. These strategies not only involve the application and management of technology but also include innovative adjustments to teaching content and methods to improve educational outcomes and engagement.

4.1 Strengthening Data Management and Ethical Norms

In the context of the big data era, strengthening data management and ethical norms in the practice of Mandarin teaching in higher vocational colleges is crucial to enhancing education quality and protecting student rights. First, schools need to establish and improve a comprehensive data management system. This system should include efficient data collection, storage, and processing functions, and must incorporate advanced data security and privacy protection measures to prevent any form of data leakage and misuse, ensuring the safety of student information.

Secondly, clear ethical norms are the foundation for ensuring the reasonable use of data. Schools must ensure that all student information collected through big data technology strictly adheres to educational ethical standards. This includes limiting the purposes of data use, ensuring that all data applications explicitly serve the improvement of education quality, and strictly confining usage within the reasonable scope of educational enhancement.

Moreover, ethical training for teachers and related staff is a key element in improving the quality of data management. Through systematic training, their understanding and sense of responsibility for data ethics can be strengthened, ensuring that they strictly adhere to ethical norms in handling teaching and research-related data, thus protecting students' privacy and rights.

Finally, schools should continuously monitor and evaluate the effectiveness of their data management systems and adjust and update data management strategies and ethical norms according to technological developments and legal updates. This continuous evaluation and adjustment process will help schools constantly optimize data management practices, ensuring they stay current and effectively address new challenges and demands.^[6]

4.2 Implementing Innovative Adaptive Teaching Strategies

In the era of big data, adaptive teaching strategies have become the core direction of educational innovation, particularly significant in the field of Mandarin teaching in higher vocational colleges. Firstly, teachers need to effectively use big data tools to analyze students' learning behaviors and performance. Such analysis can provide deep insights into students' learning progress and comprehension abilities. Based on these insights, teachers can adjust teaching content and methods in real-time to ensure they meet the diverse learning needs of students.

Further, the implementation of innovative adaptive teaching strategies requires educational institutions to provide the necessary technical support and resources. This includes investing in advanced educational technology tools and platforms, ensuring all teachers have access to and can effectively use these tools. Such technical support makes it easier for teachers to dynamically adjust and optimize teaching content.

Additionally, to promote the successful implementation of these teaching strategies, educational institutions must establish continuous professional development and training systems. This involves regular workshops and seminars, providing real-time technical support and feedback to help teachers master the latest educational technologies and teaching strategies. These measures ensure that teachers continually improve their skills and knowledge in using big data, effectively driving the implementation of adaptive teaching strategies, thereby enhancing teaching quality and student learning outcomes.

4.3 Accelerating Teacher Skill Training and Integration of Data Technology

To effectively implement big data teaching strategies in higher vocational colleges, the primary step is to enhance teachers' data technology skills through systematic training. This should include teaching

the basics of data analysis, machine learning techniques, and how to apply these technologies in Mandarin teaching. Such training enables teachers not only to operate data analysis tools but also to understand how to use these tools to optimize teaching content and methods.

Furthermore, higher vocational colleges need to provide teachers with the necessary resources and technical support to effectively integrate and apply data technology in teaching. This includes providing high-performance computing resources, advanced data analysis software, and ongoing technical support, ensuring that teachers can obtain help and guidance when needed.

Moreover, establishing a support system that encourages teachers to explore and experiment with the application of big data is crucial. This system should include professional technical consulting services and a platform where teachers can share their experiences and challenges in applying big data technology, learning from each other and progressing together.

Finally, continuous professional development is key to ensuring teachers keep pace with technological advancements. Higher vocational colleges should regularly update their training courses to include introductions to new technologies and sharing of best practices, ensuring that teachers' skills are always at the industry forefront. These measures can effectively accelerate the improvement of teachers' skills in the field of data technology, promoting the widespread application and in-depth research of big data technology in Mandarin teaching.

4.4 Increasing Student Engagement and Acceptance

Big data technology enables personalized learning by precisely analyzing students' learning habits, abilities, and preferences, allowing teachers to design individualized learning plans for each student. This approach greatly enhances students' learning motivation and effectiveness by accurately matching learning content and pace to their needs. However, to achieve this, educational institutions need to innovate in both technology and teaching design, ensuring the diversity and accessibility of teaching resources to meet the needs of different students.

Enhancing student engagement also relies on increasing classroom interaction and promoting cooperative learning among students. Big data platforms can be used to monitor students' participation activity and stimulate their interest and engagement through gamified learning, group discussions, and project collaboration. Additionally, teachers can use data analysis results to adjust teaching strategies, such as grouping students for collaborative Mandarin learning, thereby enhancing the social element and collective participation in learning.

The accessibility of technology and the user-friendliness of interfaces are crucial to students' acceptance of technology. Higher vocational colleges should choose learning management systems that are easy to operate and have intuitive interfaces, lowering the barriers for students to use big data tools. Providing ample technical support and training can help students become familiar with these tools, ensuring that technology does not become a barrier to learning.

By collecting real-time student learning data, educators can obtain immediate feedback, which is essential for timely adjustments to teaching content and methods. Teachers should use the results of big data analysis to continuously optimize teaching strategies to better meet students' changing needs. Additionally, regularly providing students with feedback on their learning progress and existing problems can help them clearly understand their learning status, enhancing their confidence and engagement in learning.

5. Conclusion

This study, through analyzing the application of big data in Mandarin teaching in higher vocational colleges, proposes practical strategies for strengthening data management and ethical norms, implementing innovative adaptive teaching strategies, and accelerating teacher skill training. Although initial success has been achieved, future research should focus more on the deep integration of big data technology and educational practice, exploring the application of data analysis in enhancing teaching interaction and student engagement. Additionally, more ethical big data application models need to be developed to ensure that technological advances simultaneously protect student information security and privacy rights.

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