Analysis of English Teaching Mode Innovation in Colleges and Universities under the Perspective of Big Data

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Abstract: This article discusses in depth the innovation strategy of English teaching mode in colleges and universities under the perspective of big data, aiming at solving the challenges faced by the traditional teaching mode in the era of information technology. The article firstly puts forward the main problems existing in the current English teaching in colleges and universities, including the dispersion of learning resources, students' insufficient knowledge of English learning and inappropriate learning methods. Subsequently, three major innovative strategies are proposed: using big data to optimise the design of personalised learning paths, constructing data-driven teaching content and assessment systems based on data, and promoting the integration of collaborative learning and practical applications. Through real-life case studies, the paper demonstrates how these strategies can be implemented in concrete terms and discusses their positive impacts on improving teaching efficiency, enhancing learning experiences, and fostering students' comprehensive English application skills. Finally, it summarises the important role of big data technology in the innovation of English teaching in colleges and universities, and looks forward to the future development trend of the teaching model. This paper provides innovative ideas and practical guidance based on big data technology for the field of English teaching in colleges and universities, aiming to promote the continuous improvement of education quality and optimisation of learning effects.

Keywords: Big Data; College English; Teaching Mode; Innovation Inquiry

Introduction

In the context of the digital era, big data technology is gradually becoming an important driving force for innovation in the field of education. Especially in English teaching in colleges and universities, big data not only provides the possibility of in-depth understanding of the learning process, but also opens up new ways for the design and implementation of personalised teaching strategies [1]. With the continuous advancement of technology and the increasing diversity of teaching needs, the traditional English teaching model is facing unprecedented challenges and opportunities. This background has prompted educators and researchers to seek innovative teaching models to adapt to the rapidly changing educational environment and learners' individual needs. In this paper, we will discuss the innovation of English teaching mode in colleges and universities under the perspective of big data, focusing on the analysis of strategies to optimise teaching design, improve teaching quality and learning efficiency using big data.

1. Difficulties Facing English Learning of Students in Colleges and Universities

1.1 Fragmentation and information overload of learning resources

In the contemporary educational environment, one of the major dilemmas commonly encountered by students in colleges and universities in the process of English learning is the dispersion of learning resources and information overload. This phenomenon stems from the rapid development of Internet technology, which has greatly enriched teaching resources but also brought about the difficulties of information screening and absorption [2]. When students are faced with a huge amount of English learning materials, it is often difficult for them to identify the quality of the resources, and it is easy for them to get lost in the disorderly information, which not only affects the learning efficiency, but also aggravates the psychological burden of learning. More critically, this dispersion of resources and information overload challenges the effectiveness of traditional teaching models and learning methods. The lack of effective guidance and screening mechanisms for students in the process of independent learning makes it easy for them to form one-sided understanding of knowledge and mastery of skills, making it difficult to achieve the cultivation goals of deep learning and critical thinking. Therefore, how to navigate effectively in the ocean of informa-

tion has become a key challenge to improve the quality of English teaching and learning effectiveness.

1.2 Insufficient awareness of English language learning among students in higher education

In the current higher education system, English, as a globally common language, has a non-negligible impact on students' future academic research and career development. Many students in higher education have insufficient awareness of the importance of English learning, a phenomenon reflected not only in students' lack of motivation to learn English, but also in their underestimation of the role of English proficiency enhancement in their personal development [3]. This situation seriously restricts the initiative and depth of students' English learning, which in turn affects the comprehensive improvement of their language skills and the broadening of their international horizons. An in-depth analysis of the reasons for this can be attributed to the inadequacy of English education in colleges and universities in terms of curriculum design and teaching methods, as well as the lack of effective strategies to closely integrate English learning with students' career planning and personal interests. English teaching focuses too much on the inculcation of grammatical rules and test-taking skills, ignores the importance of English as a communication tool in practical application, and fails to fully stimulate students' interest in learning and enthusiasm for practice.

1.3 Inappropriate English learning methods for college students

At the higher education level, the appropriateness of English learning methods has a decisive impact on students' language mastery, and the improper choice of methods in the process of English learning by college students can seriously hinder the improvement of their language skills and the optimisation of their learning efficiency. Many students rely on the traditional, teacher-centred test-taking teaching mode, ignoring the interactivity and practicality of English learning [4]. In addition, students tend to favour mechanical memorisation of vocabulary and grammatical rules and lack practice and reflection on the use of language in real contexts, which leads to the uneven development of their abilities in all aspects of listening, speaking, reading and writing. In the face of this challenge, English education in colleges and universities needs to fundamentally change its teaching philosophy and adopt more flexible and diversified teaching methods.

2. The strategy of English teaching mode innovation in colleges and universities under the perspective of big data

2.1 Optimising the design of personalised learning pathways using big data

In the big data perspective, the innovation of English teaching mode in colleges and universities is a revolution in the concept of education. The use of big data to optimize the design of personalized learning paths is essentially a way to provide customized learning experiences through in-depth analysis of students' learning behaviours, preferences and achievements. This approach ensures that teaching strategies are highly matched to the actual needs of students, thereby dramatically increasing the effectiveness and efficiency of learning. Under this philosophy, educators can more accurately identify each student's strengths and weaknesses, and tailor the most appropriate learning materials and activities for them, thus realising personalised teaching in the true sense of the word.

A university uses big data technology to collect and analyse data on students' online learning behaviours, including the distribution of study time, course completion, and correctness of exercises. Based on these data, the university developed an intelligent recommendation system that can dynamically adjust the content and difficulty of learning based on students' learning progress and performance. For students with faster mastery, the system recommends more difficult materials and deep learning tasks [5]; for areas that need to be strengthened, the system provides additional exercises and review materials. In addition, the system can recommend relevant English learning resources according to students' interests, e.g., students who like music will receive tasks for analysing English songs, and students who like sports may receive reading materials for English sports news. This personalised learning path design not only enhances students' motivation to learn, but also significantly improves the practical application of English learning.

The strategy of using big data to optimise personalised learning paths provides an innovative solution for teaching English in higher education. It not only reflects the advancement of educational technology, but also a deep understanding of and respect for students' individual differences. Through this approach, students are able to master English more efficiently in a learning environment that is more attuned to

their individual needs and interests, so that they can better cope with the challenges of the era of globalisation.

2.2 Building a data-driven pedagogical content-based and assessment system

In the wave of educational innovation led by big data technology, building a data-driven teaching content and assessment system has become an important strategy for the innovation of English teaching mode in colleges and universities. The core of this strategy lies in the precise collection and analysis of students' learning data, so as to achieve personalised adjustment of teaching content and accurate assessment of teaching effects. Through real-time analysis of students' behaviour, performance and feedback in the learning process, teachers can gain insight into each student's learning needs and progress, and further optimise the teaching plan so that it is closer to students' actual abilities and interests. This approach not only improves the relevance and effectiveness of teaching, but also greatly enhances students' learning experience and satisfaction.

A university implemented an English teaching platform based on big data analysis, which is capable of tracking students' learning activities, such as the completion of online exercises, the frequency of classroom interactions, and the quality of homework submissions, etc., and analysing these data through algorithms to identify students' learning blind spots and points of interest [6]. Based on the results of these analyses, the platform automatically recommends personalised learning resources and practice questions for each student, as well as providing targeted learning advice. In addition, teachers are able to make timely adjustments to their teaching strategies through the data analysis reports obtained by the platform, such as arranging tutoring sessions for students with slow learning progress or fine-tuning the course content to adapt to changes in the student population.

The construction of a data-driven teaching content and assessment system based on data can greatly enhance the personalisation and accuracy of teaching, and also effectively promote the optimal allocation of teaching resources and the innovation of teaching methods. It strongly promotes the improvement of the quality of English education in colleges and universities, and provides students with a more scientific, efficient and dynamic learning environment. In the future, with the continuous progress of big data technology and the updating of educational concepts, this data-driven teaching mode will show a broader application prospect.

2.3 Promoting the integration of collaborative learning and practical applications

Promoting the integration of collaborative learning and practical application is based on the recognition that the essence of language learning lies not only in the mastery of grammar rules and vocabulary, but also in the ability to apply what has been learnt in real-world communication situations. Collaborative learning emphasises group work to complete tasks and promote communication and cooperation among students, while practical application combines learning content with real-world situations to improve students' practical application skills. Big data technology plays a crucial role in this process by analysing students' learning behaviours, interaction patterns and outcomes, providing teachers with insights into students' needs and a basis for adjusting teaching strategies.

A university has adopted a big data-based English teaching system that tracks student interaction data on an online collaborative learning platform, such as the activity of discussions, the completion of team tasks, and students' participation in specific topics [7]. Based on these data, the system is able to automatically recommend partners for students, form efficient collaborative learning groups, and customise and recommend practical projects based on students' performance and preferences. For example, for groups of students who show a strong interest in business English, the system will recommend them to participate in a simulated international trade negotiation project, which includes real-time online meetings, business report writing, and project presentations, aiming to enhance their English application and teamwork skills.

In conclusion, by combining collaborative learning with practical applications and leveraging the powerful analytical capabilities of big data technology, the effectiveness of English language teaching in colleges and universities and the learning experience of students can be greatly enhanced. This strategy promotes mutual support and sharing among students, and also enables them to exercise and demonstrate their language skills in real-life application scenarios, laying a solid foundation for their future academic and professional careers.

Conclusion

The application of big data technology in the field of English teaching in colleges and universities has opened up new paths, making the teaching content and assessment system more scientific and personalised, while promoting the deep integration of collaborative learning and practical application. This innovative teaching mode not only improves teaching quality and learning efficiency, but more importantly, it cultivates students' critical thinking ability, problem-solving ability, and intercultural communication skills, laying a solid foundation for their future academic development and career. In the future, with the further development of technology and the continuous innovation of education model, the college English teaching model based on big data will show a broader development prospect and make greater contributions to the development of global education.

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