

NAVIGATING THE DIGITAL FRONTIER: A THOROUGH EXAMINATION OF ADAPTING COLLEGE ENGLISH EDUCATION TO THE BIG DATA ERA

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Abstract: In the era of big data and advanced network technology, college English education is undergoing a significant transformation, departing from traditional chalk-and-board teaching methods towards modernized approaches. This shift is largely driven by the adoption of innovative information science means and the increased prevalence of big data applications.

English, being the foremost language for international communication, holds immense importance in today's globalized world. To equip students with essential language skills for effective international interactions, the field of English education has witnessed extensive research and developments. Scholars like Ernesto Macaro have delved into the beliefs of university teachers and students, demonstrating how teaching academic subjects in English as a second language can enhance both language proficiency and content learning. Similarly, Waheeb S. Albiladi's exploration of blended learning's application in English teaching reveals its effectiveness in nurturing language skills, enhancing the English learning environment, and boosting students' motivation to learn. Furthermore, Fuhua Liu addresses the challenges faced in humanities-based college English teaching courses and suggests remedial measures, emphasizing the significance of cultural knowledge and practical skills in achieving language learning goals.

This evolving landscape of English education underscores the need for a dynamic and holistic approach that integrates language proficiency with cultural awareness and practical competencies, preparing students for successful international communication.

Keywords: college English education, big data, language proficiency, cultural knowledge, blended learning, international communication.

Introduction

With the increasing maturity of network technology, information science means has been used more and more, and the era of big data has arrived. Under the influence of this background, college English education has also been continuously innovated. The traditional methods of English education in schools have been fundamentally changed. Through a piece of chalk, a blackboard, a pointer, and a book, the teacher talked from beginning to end. This traditional teaching method is increasingly challenged by modern large-scale open online courses, and modern English teaching based on big data has become a mainstream.

English is the most widely used language in international communication. Attaching importance to English teaching can promote students to master the skills of international communication. Many scholars have made many discussions on English education. Ernesto Macaro investigated the beliefs of university teachers and students, and then synthesized evidence to demonstrate the impact of teaching academic subjects in English as a second language on enhancing English proficiency and content learning [1]. Waheeb S. Albiladi reviewed the application of blended learning in English teaching, and proved that blended learning could be effectively used to cultivate language skills, improve English learning environment, and promote students' learning motivation

[2]. Fuhua Liu analyzed in detail the reasons why humanities education in college English teaching courses failed to achieve students' language goals, briefly introduced the essence of content based teaching and the phenomenon of applying humanities based teaching to achieve students' language goals, and proposed corresponding remedial measures [3]. To achieve good teaching results in college English teaching, it is necessary to attach importance to the cultivation of cultural knowledge and practical abilities.

College English teaching should focus on knowledge as the core and emphasize ability training. Many scholars have discovered some problems in their exploration and practice. Li Jiang investigated subject teachers' views and practices on English teaching, as well as students' motivation and needs for English learning, and proved that effective teaching could be maintained through the use of pragmatic strategies. When language teaching was given sufficient attention, English achievement goals would also be achieved [4]. Yayan Yu believed that improving reading quality was the key to improving the quality of college foreign language teaching, and interactive teaching was a dynamic factor. Cooperative learning strategy was an important way to improve learning efficiency [5]. Ming Zhang invested and analyzed ideological data in college English teaching in the current context from aspects such as cognitive ability, cognitive environment, cognitive characteristics, and cognitive measures, and proposed beneficial measures [6]. The reform of college English teaching is a complex system engineering, and to truly implement it, it must start from several aspects such as teachers, textbooks, students, teaching methods, evaluation, etc. Only in this way can the quality of teaching be guaranteed and the ultimate goal of cultivating qualified talents be achieved.

Big data artificial intelligence and other technologies are widely used in language education, especially in English language education. Many experts and scholars have realized its significance. Meng-yue Cao believed that with the rapid development of integrated information technology, artificial intelligence brought new opportunities for college English teaching. The college English cultural intelligence assisted teaching system played an important role in improving teaching quality and efficiency [7]. Zhuomin Sun combined artificial intelligence modules with knowledge recommendation for teaching assistance systems and developed an online English teaching system that helped explore the potential internal connections between evaluation results and various factors, helping students improve English teaching efficiency that was in line with their knowledge mastery and personality [8]. Kanmanli Maimaiti used ant colony optimization algorithms to find the best path for English teaching mode innovation, and completed the modeling and analysis of English teaching mode innovation path in the context of big data, which had a good rate of convergence [9]. Kessler Greg believed that social interactions mediated by technology, such as social media, artificial intelligence, big data and augmented reality, to a large extent dominated people's daily life, benefit language learners, and enabled them to participate in the learning experience [10]. Entering the 5G (5th Generation Mobile Communication Technology) era, many advanced technologies have been applied to the education industry, making traditional English teaching methods face changes and challenges.

Aiming at some shortcomings in traditional English education methods, such as: The methods and methods of teachers in English classroom teaching are relatively simple, and the teaching content is not rich and attractive enough, which leads to a series of problems of students' low interest in English learning. Based on this, this paper first analyzed the current situation of English course education and made an in-depth discussion on English teaching methods under modern big data technology. This paper focused on the realization of English education content informatization based on Internet technology, so as to establish diversified evaluation criteria and the feasibility of using big data technology to realize English education programs, and promote the scientific and detailed development of college English education.

1. Necessity of College English Teaching Innovation in the Era of Big Data

1.1 Breaking Free from the Constraints of Traditional Educational Methods and Concepts

Under traditional teaching methods, teachers mainly rely on theoretical knowledge to impart knowledge. However, with the growth of modern technology, many disciplines have begun to attempt to integrate modern educational concepts into classroom teaching [11-12]. As an international common language, English has developed different characteristics in the context of the development of the times.

Therefore, English education methods should also keep pace with the times and seek for development. Big data analysis technology has created unique opportunities to English teaching, greatly enriching and improving teaching methods [13].

In the context of expanding database capacity, the old and boring classroom teaching can not satisfy the contemporary college students for fast knowledge updating and diverse information access channels. Classroom teaching has also changed. Books are simply not the main learning tools for students to learn English, but students' independent learning has taken its place. Online teaching platforms such as Flipped classroom, admiring classes and loving courses are rising rapidly. This new teaching model, combined with online teaching, not only provides a rich and vivid language environment for school teachers and students, but also better cultivates their interest and love for language learning. It enhances students' self-learning ability, increases communication and cooperation between students, and is more conducive to the opportunity to exert subjective initiative, thereby promoting the transformation of students' thinking patterns [14].

1.2 Improving Teaching Efficiency and Quality

Informatization means in the big data era have optimized the teaching content [15]. The networked teaching system achieves resource sharing, allowing teachers to effectively integrate teaching resources through the Internet. The integration of teaching resources can effectively improve the teaching efficiency of the classroom, attract the attention of students, mobilize the enthusiasm of students, and enhance the interactive effect of the classroom. These changes bring new challenges and opportunities to traditional classroom teaching. It not only promotes the transformation of college English education forms, but also promotes the continuous improvement of students' English learning ability, thus improving the teaching effect.

In the information to intelligent stage, students should not only learn knowledge and skills, but also learn how to use these knowledge to promote their own development and improvement. The biggest advantage of applying big data to English teaching is that it can introduce personalized teaching solutions through accurate analysis of each child's learning situation, launch personalized teaching solutions, and use big data to learn English, so as to actually teach students in accordance with their aptitude. For example, targeted training is provided for students who have poor exam results but have a strong interest in English. For those who have good grades but are not familiar with learning methods, systematic guidance is provided. In this teaching mode, everyone can find their own goals and directions, and achieve maximum personal value.

To sum up, the implementation of big data and classroom teaching is an inevitable pattern of teaching development. Artificial intelligence+education would become the mainstream trend in the future. The smart classroom based on mass data assessment has been highly used in the education field with its options of high intelligence and good interaction effect, promoting the improvement of teaching quality [16-17]. In addition, it makes up for the limitations of general teaching, improved the classroom teaching mode, and made teachers change from simply imparting knowledge to guiding students to explore independently, so that teachers and students can be more closely combined, so as to reach the goal of mutual benefit between teaching and learning, and promote teachers' information processing ability and big data application ability.

2. Implementation Strategies of College English Teaching Reform in the Era of Big Data

2.1 Building a Big Data Learning Platform

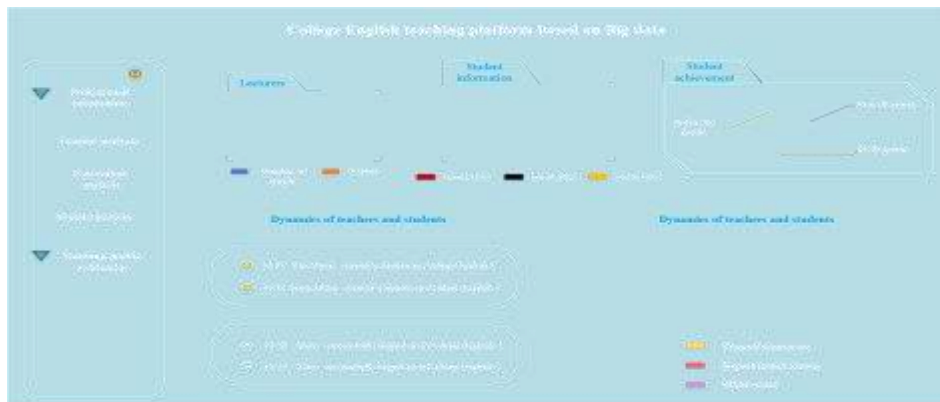


Figure 1. English teaching platform based on big data

The overhaul of college English teaching mode in the era of big data urgently needs to build a digital course teaching resource website, and build an open learning environment that is rich in content, shared by teachers and students, and not restricted by time and space. Under the precondition of stable quality and speed of information transmission, it can retrieve, analyze and use massive resources, and provide a healthy environment for teachers and students to communicate and cooperate, thus ultimately promoting the robust growth of students' language ability and knowledge level, as shown in Figure 1.

Teachers on the platform transmit English learning resources, publish learning tasks, and can share various resources related to English on the platform. Students can independently download resources and watch teachers assign assignments, learning tasks, etc. on this platform. Both teachers and students can acquire rich skills and achieve the deep integration of information technology and education. Students can also interact with other users. If they have any questions or doubts, they can consult their English teacher at any time. When the teacher is too busy to answer, they would reserve a certain amount of time on the platform, and wait for the teacher to read it before answering questions for the students. It can be said that the features of the innovative English teaching platform, such as information sharing, value collision, consolidation of inherent knowledge, and integration of external knowledge, significantly promote the innovation of university education methods and concepts. This changes a static teaching way and promotes college English education through dynamic English teaching [18].

2.2 Reasonable Application of Micro Course Teaching

In the context of the continuous improvement of big data and its related fields, English teaching has undergone new changes in teaching philosophy, teaching content and teaching methods [19-20]. Micro courses, as a new teaching method, have the characteristics of strong interactivity, rich content, and large amount of information, allowing teachers have a deeper understanding of the focus of teaching and promote the expansion of students' thinking and the leap of learning quality. At the same time, it also effectively absorbs multimedia technology and language learning materials to enhance the depth, intensity and breadth of English learning. For example, it adds interactive links, and reduces the burden of teacher preparation. It reduces the number of classroom assignments, and creates a strong atmosphere, thus facilitating the formation of autonomous learning habits and the cultivation of innovative abilities, and promoting the upgrade of college students' English proficiency.

2.3 Establishing a Ubiquitous English Teaching Model

Ubiquitous English is an open course model based on internet technology, which breaks the original disciplinary boundaries and allows people from different fields to participate. Through online interactive teaching, the aim of immersive learning is completed. This new teaching model is more adaptable to the higher needs of the current

information age for college students, in line with the original intention of education reform, to realize the convenience and timeliness of information exchange, thus providing the maximum degree of support and service and stimulating learners' innovation awareness and practical ability.

With the advance of the times, teaching is more than a simple process of knowledge transfer and experience output. It also carries the iteration of new technologies and the intersection of ideas. How to enable students to transform what they have learned into new information and capabilities is one of the serious problems to be solved in today's education reform. Teachers should seize the opportunities brought by new media, take the initiative in education, and adjust their own teaching mode in combination with their own professional advantages. They should change students' learning methods, mobilize students' enthusiasm to participate in teaching interaction, guide students to break through the conventional thinking, and enhance their sensitivity to data. At the same time, the school also needs to strengthen the investment in the big data system and improve the ease of use.

3. Evaluation of College English Teaching Reform Effect Based on Big Data

3.1 Student Performance

Class A was selected as the experimental subject, and students in this class were evaluated for a total of 5 months and about 20 weeks from three aspects: classroom performance, homework completion, and extracurricular self-study. A maximum score of 100 points was set for each evaluation indicator, with a passing score of 60 points and an excellent score of over 80 points. In the third month, the teaching reform was started based on big data technology. Online personalized tutorship was achieved by establishing learning files and online course platforms, and students' performance before and after the reform was analyzed. The results are shown in Figure 2.

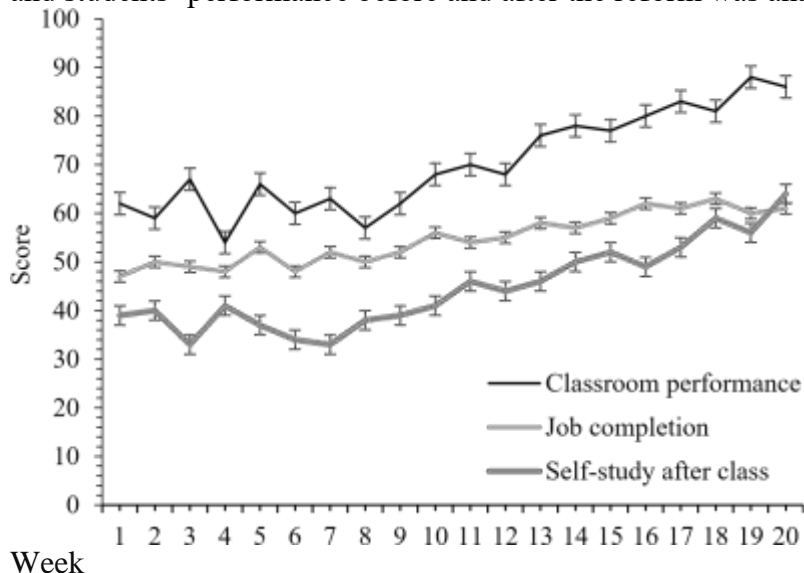


Figure 2. An analysis of students' performance before and after college English teaching reform

In weeks 1-8, students' classroom performance, homework completion, and extracurricular self-study were not very stable; from the 9th week to the 20th week, the teaching reform based on big data began, students' passion for learning began to rise, and the level of activity in the classroom improved, which showed that the teaching reform achieved initial results. However, the completion of students' homework was still not ideal, so it was necessary to improve these issues in the subsequent teaching reform process.

3.2 Teaching Quality Evaluation

The teaching quality of Class A before and after the English teaching reform was quantitatively evaluated. According to the teacher's teaching behavior norms, students' learning status, and the degree of achievement of learning goals, quantification is carried out. Among them, the maximum score set for student status is 30 points, and the maximum score for teacher behavior is 40 points. The highest goal achievement score is 30 points. These total 100 points. Each indicator is further divided into three levels, and the score range for each level is given. The specific scoring criteria are shown in Table 1.

Table 1. Teaching quality scoring standards

Index	Description	Grading			Score
		In general	Better	Excellent	
Student status	Participate in	6-8	8-9	9-10	-
	Cooperation	6-8	8-9	9-10	-
	Thinking	6-8	8-9	9-10	-
Teaching behavior	Teaching objective	6-8	8-9	9-10	-
	Teaching content	6-8	8-9	9-10	-
	Teaching process	12-16	16-18	18-20	-
Goal accomplishment degree	Student learning effect	12-16	16-18	18-20	-
	Basic skills of teachers	6-8	8-9	9-10	-
Comprehensive evaluation					

The full score of the scoring standard is 100 points. Ten experts are invited to score the college English teaching quality before and after the reform of the big data era according to Table 1. The score of 60-80 points is average, the score of 81-90 points is good, and the score of more than 90 points is excellent. The teaching quality evaluation results before and after the reform are shown in Table 2.

Table 2. Results of teaching quality evaluation

Number	Before	After
1	69	80
2	72	81
3	68	77
4	77	90
5	75	90

6	83	93
7	76	80
8	81	94
9	73	79
10	78	83

Before the reform, Class A adopted traditional teaching methods for teaching, and only two experts gave an evaluation of 81 points or above. Most experts believed that the teaching method before the reform was inefficient, with students' learning status not good enough and learning goals not being achieved well. After the reform, the scores were higher. Teachers' teaching behavior was more standardized and had personal teaching styles, and students' participation and goal completion effects were both good. After calculation, the average score before the reform was around 75.2 points, which was at an average level. The average score after the reform was around 84.7 points, which was at a good level. The teaching quality improved by about 12.63% after the reform.

4. Conclusions

Since entering the information age, great changes have taken place in the way people obtain and communicate information. In the context of big data, the innovative teaching mode is more suitable for the real learning situation of contemporary college students, achieving the goal of student-centered, personalized teaching, constructing new teaching interactive scene and ecology, automatically classifying and storing test issue, and assisting teachers in accurate assessment. The student end can automatically collect incorrect questions and establish a question bank, promoting the diversification of college English teaching. This paper made an in-depth discussion on the creativity of integrating big data into education, discussed the difficulties and main challenges of current school education, and summarized some relevant countermeasures and suggestions for these problems to satisfy the requirements of the current society for English skills and promote the development of college English teaching.

References

- Ernesto Macaro, Samantha Curle, Jack Pun, Jiangshan An, Julie Dearden. "A systematic review of English medium instruction in higher education." *Language teaching* 51. 1 (2018): 36-76.
- Waheeb S. Albiladi, Khlood K. Alshareef. "Blended learning in English teaching and learning: A review of the current literature." *Journal of Language Teaching and Research* 10. 2 (2019): 232-238. [3] Fuhua Liu. "Failure of humanities-based instruction to achieve students' language goal in college English courses." *Journal of Language Testing & Assessment* 3. 1 (2020): 1-4.
- Li Jiang, Lawrence Jun Zhang, Stephen May. "Implementing English-medium instruction (EMI) in China: Teachers' practices and perceptions, and students' learning motivation and needs." *International Journal of Bilingual Education and Bilingualism* 22. 2 (2019): 107-119.
- Yayan Yu. "The research on cooperative learning in English reading teaching in college." *Theory and Practice in Language Studies* 9. 6 (2019): 678-687.
- Ming Zhang, Shenglu Li. "Ideology in college English teaching under the background of courses for ideological and political education." *Open Access Library Journal* 8. 2 (2021): 1-10.
- Mengyue Cao, Li Dan, and Wang Jun. "A Study of College English Culture Intelligence-Aided Teaching System and Teaching Pattern." *English Language Teaching* 13. 3 (2020): 77-83.

Zhuomin Sun, M. Anbarasan, D. Praveen Kumar. "Design of online intelligent English teaching platform based on artificial intelligence techniques." *Computational Intelligence* 37. 3 (2021): 1166-1180.

Kanmanli Maimaiti. "Modelling and analysis of innovative path of English teaching mode under the background of big data." *International Journal of Continuing Engineering Education and Life Long Learning* 29. 4 (2019): 306-320.

Kessler Greg. "Technology and the future of language teaching." *Foreign language annals* 51. 1 (2018): 205-218.

Stephanie Wescott. "What an English teacher knows: Teaching in the post-truth era." *Changing English* 28. 1 (2021): 118-130.

Liz Dale, Ron Oostdam, and Marjolijn Verspoor. "Searching for identity and focus: Towards an analytical framework for language teachers in bilingual education." *International Journal of Bilingual Education and Bilingualism* 21. 3 (2018): 366-383.

Emiliana Putri, et al. "An impact of the use Instagram application towards students vocabulary." *Pustakailmu. id* 2. 2 (2022): 1-10.

Given Lee, Amanda Wallace. "Flipped learning in the English as a foreign language classroom: Outcomes and perceptions." *TESOL quarterly* 52. 1 (2018): 62-84.

Maria Ijaz Baig, Liyana Shuib, Elaheh Yadegaridehkordi. "Big data in education: a state of the art, limitations, and future research directions." *International Journal of Educational Technology in Higher Education* 17. 1 (2020): 1-23.

Ge Houwei. "Research on the Chinese foreign English teaching quality assessment with intuitionistic fuzzy information." *Journal of Computational and Theoretical Nanoscience* 15. 1 (2018): 278-281.

Haitao Yao. "Innovation and exploration of College English teaching mode based on big data background." *Overseas English* 392. 04 (2019): 154-155.

Bin Yi, Mandal Durbadal. "English teaching practice based on artificial intelligence technology." *Journal of Intelligent & Fuzzy Systems* 37. 3 (2019): 3381-3391.

Heng Zhang, Shengji Jin, Shizheng Du. "Developing a curriculum model of English teaching for master's degree nursing education in a Chinese medicine university." *International Journal of Nursing Sciences* 7. 1 (2020): 99-104.

I Ketut Wardana, Putu Ayu Paramita Dharmayanti, Anak Agung Putu Arsana. "ELT lecturers' communicative language teaching approach in directing students' emotions in distance learning." *Studies in English Language and Education* 9. 3 (2022): 1071-1092.