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2025 Volume 3, Issue 5
Lecture Notes in Education, Arts, Management and Social Science
ISSN(Online): 2705-053X

The Reform and Innovation Path of Teaching Models in Private Colleges and Universities in the Context of Big Data

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Abstract: In recent years, big data technology has developed rapidly in China and gradually penetrated into the field of education, becoming an important driving force for the transformation of teaching models in colleges and universities. Although major colleges and universities have realized the importance of big data, there are still many problems in its application in teaching practice. How to adapt to the trend and apply big data to teaching has become an important issue faced by colleges and universities. Based on this, this article briefly summarizes the current situation of teaching models in colleges and universities in the context of big data, analyzes the problems faced by teaching models in colleges and universities in this context, and on this basis, proposes specific strategies for optimizing teaching models, hoping to provide useful references for relevant educators.

Keywords: Big data; Colleges and universities; Teaching models; Reform and innovation

Online publication: June 26, 2025

1. Introduction

To meet the needs of social and economic transformation and development, the reform and innovation of teaching models in colleges and universities in the context of big data deserve the attention and in-depth thinking of educators. At present, big data has been widely applied in the teaching process, providing technical support and guarantee for the improvement of teaching quality in colleges and universities. However, there are still some prominent problems in the actual application of big data in teaching, such as the shallow integration of traditional teaching models and big data, and the imperfect optimization mechanism of teaching resources in colleges and universities, which makes it difficult to give full play to the educational advantages of big data.

2. The current situation of teaching models in colleges and universities in the context of big data

2.1. The reform of traditional classroom teaching

In the past teaching activities, teachers mainly used textbooks and blackboard writing as media to impart knowledge.

This traditional model has a single teaching element, making it difficult to attract students' attention. Students can only passively receive knowledge, resulting in a dull and boring classroom atmosphere and low student participation enthusiasm. The advent of the big data era has brought a turning point to traditional classrooms. New technologies and tools have been introduced into teaching, reducing the time for teachers to write on the blackboard and presenting knowledge in a more systematic and diversified way, which is convenient for students to understand. At the same time, it can also increase the interactivity of the classroom, making the classroom more interesting and novel.

2.2. Creating diverse teaching models

Big data has built a bridge for communication and cooperation among colleges and universities, promoting the wide spread and application of excellent teaching models[1]. At present, teaching models in colleges and universities are becoming increasingly diverse, breaking the shackles of traditional classrooms. Practical, simulation, interactive, and innovative teaching have been integrated into daily teaching. With the help of big data, colleges and universities deeply explore the potential of these new teaching models and conduct deeper development and application in practice. Practical teaching allows students to get hands-on practical operations, simulation teaching can create real-life scenarios for students, and interactive teaching can drive the exchange of students' thinking.

2.3. Optimizing teaching resources

The library has always been the core place for colleges and universities to store teaching resources. However, with the advent of the big data era, the focus of data collection in college libraries has shifted from paper books to e-books. This change saves library space, breaks through the limitations of borrowing paper books, and improves resource utilization. Nowadays, the construction and maintenance of new-type digital libraries have become important tasks. New-type digital libraries provide more abundant and convenient teaching resources for teachers and students in colleges and universities, strongly promoting the reform of teaching models in colleges and universities in the context of big data and injecting new impetus into the development of college education[2].

3. Problems faced by teaching models in colleges and universities in the context of big data

3.1. Traditional classroom and big data are limited to superficial integration

Most college teachers still follow the traditional teaching model and are still in the exploration stage when facing the new teaching model driven by big data. It is difficult to give full play to the advantages of big data technology in classroom teaching. At the same time, in the big data era, it is more convenient to obtain resources, and the channels are more diverse. How to effectively connect traditional teaching resources such as textbooks and blackboard writing with the rich teaching resources in the big data era is a test for college teachers. The big data era puts forward higher requirements for the knowledge reserve and teaching ability of college teachers[3-5]. Colleges and universities should explore feasible ways to improve teachers' teaching level using big data, promote the integration of big data and traditional classrooms, and facilitate the innovation of teaching models in colleges and universities.

3.2. Diverse teaching models are in the exploration stage

Although colleges and universities are constantly exploring and communicating with each other in practice, there are still many thorny problems in constructing a diverse teaching system. On the one hand, colleges and universities must consider how to coordinate traditional classrooms and diverse classrooms. Traditional classrooms mainly focus on the imparting of theoretical knowledge, while diverse classrooms focus on cultivating students' practical and creative abilities. Finding the balance between the two, avoiding the separation of theory from practice while preventing the compression of theoretical teaching time due to excessive practice, has become the key[6]. On the other hand, the form

of diverse classrooms is directly related to students' learning interest and efficiency. Colleges and universities should design classroom content and forms that match different disciplinary characteristics to improve teaching quality and meet students' learning needs[7].

3.3. The optimization mechanism of teaching resources needs to be improved

Under the traditional teaching model, teaching resources are promoted at a fixed cycle based on academic journal publications, national laws and regulations revisions, etc. In the big data era, data is highly time-sensitive, with an extremely large amount of resources and a much higher update frequency than before[8-10]. However, the quality of massive data resources varies. This requires colleges and universities to accelerate the update rhythm of teaching resources and strictly screen data to ensure the introduction of high-quality resources. At present, most colleges and universities generally lack professional big data collectors and analysts for teaching resources. This shortage makes it difficult for colleges and universities to update and optimize teaching resources efficiently and fully tap the potential of big data in improving teaching resources.

3.4. The popularization of big data collection systems is inadequate

At present, the popularization of student big data collection systems is not satisfactory. Many colleges and universities have not established corresponding systems, making it difficult to comprehensively and accurately collect student data to understand students' learning dynamics. Without a complete collection system, colleges and universities find it difficult to make full use of big data, adjust teaching strategies according to students' actual situations, and the transformation of teaching models to meet students' needs will inevitably be hindered[11].

4. Strategies for optimizing teaching models in colleges and universities in the context of big data

4.1. Giving full play to the advantages of big data technology and building a resource sharing platform

Big data, with its characteristics of large capacity, fast access speed, and diverse types, provides a rich resource foundation for diversified blended teaching in colleges and universities. Building a resource sharing platform with the help of big data technology can improve the convenience of online teaching, meet the needs of various teaching forms such as videos, live broadcasts, and consultation interactions, and enrich the types of online learning resources. In the learning of professional courses, students can communicate with teachers and classmates about learning problems through the online education platform, improving learning efficiency. Teachers can use big data to analyze students' online autonomous learning situations and adjust teaching methods and content based on the results, making teaching more suitable for students' actual situations. By combining traditional classrooms with modern teaching methods, teachers can formulate teaching plans, reasonably select teaching content, provide sufficient resources for students' in-depth learning, and optimize curriculum design based on a comprehensive understanding of students' learning situations[12].

Colleges and universities should seize the opportunities brought by big data, promote the reform of diversified blended teaching models, implement the co-construction and sharing of high-quality teaching resources, create opportunities for academic exchanges at home and abroad for teaching teams, promote the in-depth integration of industry, academia, and research, improve the school-enterprise cooperation mechanism, support the construction of resource sharing platforms, break down the barriers between colleges and universities, strengthen communication and cooperation, realize the sharing of high-quality resources, reduce the construction cost of resource facilities, strengthen the guarantee for reform and innovation, and promote the development of college education towards high-quality and in-depth directions[13].

4.2. Focusing on the innovation of teaching models and construction of diverse teaching models

In the context of big data, teachers can integrate multiple teaching methods to create efficient classrooms, meet students' personalized and diversified learning needs, and promote the formation of diverse teacher-student relationships. This can be carried out from the following three aspects:

First, innovate teaching models relying on big data. Integrate big data into all stages of teaching. With its rich and open characteristics, it can provide high-quality resources for teachers' lesson preparation, students' preview, and the introduction of new lessons. Although implementing this model breaks through the time and space limitations of traditional classrooms, teachers should combine the characteristics of professional courses, screen teaching content and network resources, reasonably adjust classroom time according to students' needs, and reserve enough time for answering questions to encourage students to focus on professional knowledge learning[14].

Second, adopt group cooperation. This method can exercise students' teamwork ability, deepen students' understanding of abstract professional knowledge, and add fun to teaching. In addition, teachers can create diverse teaching scenarios for students by using modern teaching technology, strengthen teacher-student and student-student interactions, and narrow the distance between teachers and students. Under the group cooperation learning model, teachers can use smart classrooms and big data to analyze students' learning behaviors, grasp common problems, answer questions in a timely manner, and enhance learning effectiveness.

Third, transform the traditional teacher-dominated teaching model. Give full play to the advantages of diversified blended teaching, integrate advanced teaching technologies into all teaching links, encourage students to learn and explore independently, highlight students' dominant position, and stimulate their subjective initiative. Teachers should do a good job in guidance, use the convenience of "online + offline" to answer questions, make up for the deficiencies of traditional classrooms, optimize the teaching process, enhance the knowledge-learning experience, and improve teaching efficiency.

4.3. Optimizing the course teaching team and strengthening the teaching staff

Teachers play a core role in teaching. Their teaching ability and professional quality are solid guarantees for promoting the innovation and reform of teaching models. Colleges and universities can improve teachers' teaching qualities from the following aspects:

First, transform educational concepts. In the big data era, teachers should deeply understand the importance of teaching reform and establish new teaching concepts. Actively integrate big data into teaching, overcome the disadvantages of traditional teaching with the advantages of this model, and flexibly use means such as "online + offline" and "internet + education" to improve teaching quality.

Second, improve teachers' diversified blended teaching ability. In the context of big data, teachers should not only have solid teaching basic skills but also be proficient in modern teaching technology to meet the needs of reform. Colleges and universities should regularly organize in-school training activities, invite excellent teachers and experts from other schools or professional fields to conduct academic exchanges, share teaching reform experience, and enhance the teaching ability of teachers in their own schools. Adopt forms such as hierarchical training and remote training to facilitate teachers to learn advanced experience at any time, improve their teaching awareness and quality, and provide support for the reform. In addition, invite technical experts to hold short-term big data technology training and seminars for teachers of various majors to help teachers master relevant professional knowledge, improve practical operation ability, and optimize teaching effects[15].

Finally, in response to the problems of heavy tasks and insufficient motivation of teachers before the reform, colleges and universities should seize the opportunity of reform and adopt appropriate incentive measures, such as professional title evaluation and promotion, and selection of excellent teachers. Reasonably arrange class hours according to the current teaching reality, not only solving the problems faced by teachers but also fully stimulating teachers' enthusiasm and initiative to participate in teaching reform, fundamentally strengthening the guarantee for the

educational and teaching reform in colleges and universities.

4.4. Optimizing the teaching evaluation system to help improve the quality and efficiency of education and teaching

In the big data era, colleges and universities should scientifically construct a teaching evaluation system according to the characteristics of this teaching model, use multiple evaluation methods to ensure comprehensive and accurate evaluation results, and truthfully present the results of the reform. Colleges and universities can start from two aspects. First, conduct a comprehensive assessment of students by combining process-based and summative evaluations. In the big data era, classroom teaching covers pre-class, in-class, after-class, and online and offline links. Teachers should conduct process-based evaluations on this basis. Specifically, teachers can use big data technology to regularly check students' login frequencies on online platforms, homework completion situations, and learning resource usage, so as to judge students' learning attitudes and degrees of engagement, and encourage them to participate in the teaching reform throughout the process. Summative evaluations focus on assessing students' knowledge application and problem-solving abilities, testing learning results, and providing feedback on teaching problems, helping teachers solve common problems in students' learning and promoting the improvement of teaching models. Second, conduct multiple evaluations of teachers. Evaluate teachers from aspects such as curriculum design, classroom organization, and teaching and research abilities, and understand teachers' use of online teaching resources and classroom teacher-student interactions. At the same time, provide a variety of incentive measures to enhance teachers' enthusiasm for participating in teaching reform. For example, implement a reward-and-punishment mechanism based on multiple evaluations. Reward teachers who perform outstandingly in the teaching model reform, effectively stimulating teachers' motivation to promote the innovation of teaching models.

5. Conclusion

The big data era is driving the reform and innovation of teaching models in colleges and universities. Understanding, recognizing, and applying big data are important tasks for educators at present. How to solve the problems faced in the practical application of big data technology and use big data to further promote the update of existing teaching models is a key issue that colleges and universities need to address. Colleges and universities should be based on the background of the big data era, take comprehensive measures from dimensions such as building resource sharing platforms, constructing diverse teaching models, optimizing course teaching teams, and optimizing teaching evaluation systems, improve the quality of talent training, and promote the high-quality development of college education.

Funding

This article is the research result of the 2023 research project of the Private Education Association of Sichuan Province, "Research on the Reform and Innovation of Classroom Teaching Models in Private Colleges and Universities" (Project No. MBXH23YB33).

Disclosure statement

The author declares no conflict of interest.

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