

Exploration of Innovative Teaching Paths for AI-Enabled Big Data Technology Courses

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Abstract: With the continuous development of China's digital economy, big data technology has gradually become an important part of promoting industrial transformation and upgrading. The cultivation of big data talents will also exert a profound influence on China's economic development. As a core approach to cultivating interdisciplinary data talents, the teaching mode of the Big Data Technology major is confronted with many problems. Teachers may try to introduce artificial intelligence (AI) technology into classrooms to provide new ideas for solving these problems. In view of this, this paper analyzes the innovation of AI-enabled teaching for Big Data Technology courses and puts forward several strategies for reference.

Keywords: AI; Big Data Technology major; Curriculum teaching; Innovative path

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1. Significance of AI-enabled teaching for Big Data Technology courses

1.1. Meeting industrial development needs and helping resolve the contradiction between talent supply and demand

At present, China's big data industry is transforming toward intellectualization and integration. The demand for big data talents in relevant industries has gradually shifted from traditional data processing to integrated application capabilities. By introducing AI technology into the Big Data Technology major, real industrial big data projects and scenarios can be better brought into classrooms, enabling students to further improve their practical abilities in a simulated real working environment ^[1]. In addition, the application of AI technology helps teachers update teaching content in a timely manner. Teachers can introduce cutting-edge technologies such as machine learning and deep learning into classrooms to ensure that teaching content keeps pace with industrial technologies, thereby cultivating more talents with integrated "big data + AI" application capabilities and better resolving the current contradiction between talent supply and demand.

1.2. Promoting the reform of teaching modes and improving teaching quality and efficiency

Introducing AI technology into big data major teaching can effectively promote the reform and optimization

of teaching modes. Teachers can transform the teaching mode from “traditional cramming” to “intelligent interactive”, thus achieving dual improvement of teaching quality and efficiency. Furthermore, AI technology helps teachers build a more intelligent teaching platform to realize intelligent management and push teaching resources to a higher level ^[2]. Teachers can also analyze students’ learning behaviors and progress through AI algorithms, and push personalized learning resources according to students’ actual needs to better meet the learning demands of students at different levels.

In addition, AI technology can replace teachers to complete some repetitive teaching tasks, allowing teachers to devote more energy and time to teaching innovation and practical guidance, thus greatly improving the efficiency of teaching work ^[3]. Moreover, teachers can use AI virtual simulation technology to simulate the whole process of big data processing, solving problems such as insufficient equipment and limited scenarios in traditional practical teaching. Students can practice repeatedly in a virtual environment to improve their practical operation abilities.

1.3. Cultivating students’ innovative ability to adapt to the development of the digital era

The development of the digital era puts forward higher requirements for talents’ innovative abilities. Therefore, the teaching of the Big Data Technology major should not only impart professional knowledge and skills to students, but also focus on developing their innovative thinking and innovative abilities. The integration of AI technology and Big Data Technology course teaching can provide students with a more diversified, innovative practice platform, which is conducive to stimulating students’ innovative potential ^[4].

Generally speaking, AI technology can provide students with more intelligent, innovative tools and environments. For example, AI algorithms can assist students in data modeling and data analysis, enabling them to verify their innovative ideas more quickly. In addition, teachers can use the AI virtual simulation platform to guide students to independently design big data processing schemes and carry out more innovative practical activities, which can effectively cultivate students’ innovative thinking and practical abilities.

Furthermore, the introduction of AI technology enables students to take the initiative to explore the cutting-edge fields of big data and AI integration, stimulating their learning interest and desire for exploration, and further promoting the development of their autonomous learning and innovative abilities ^[5].

2. Existing problems in the current Big Data Technology course teaching

2.1. Outdated teaching concepts and lack of AI integration awareness

At present, the teaching concept of the Big Data Technology major in many colleges and universities still stays at the traditional level of “knowledge imparting.” Teachers in class focus more on the systematic explanation of theoretical knowledge, ignoring the cultivation and development of students’ practical and innovative abilities, which easily leads to the disconnection between teaching concepts and the demand for interdisciplinary talents in the big data industry ^[6].

In addition, many teachers lack the awareness of integrating AI into course teaching. They have insufficient understanding of the application value of AI technology in teaching, and some even regard AI technology as only a teaching aid, making it difficult to exert the core role of AI technology in teaching innovation and personalized teaching. Some teachers have a certain resistance to AI technology, worrying that AI will replace teachers’ teaching work, resulting in a lack of enthusiasm for taking the initiative to learn

AI technology and explore the integration path of AI and course teaching ^[7].

Moreover, some colleges and universities pay insufficient attention to AI-enabled teaching and lack corresponding policy support and capital investment, which easily leads to low efficiency in the integration of AI technology and course teaching. The overall teaching concept is difficult to adapt to the development requirements of the digital era.

2.2. Outdated teaching content disconnected from industrial technology iteration

Big data and AI technologies develop extremely fast with the constant emergence of new technologies and methods. However, the update speed of teaching content for Big Data Technology courses lags relatively, which easily leads to problems such as “outdated textbooks and discontented content.” At present, the textbook content used in some colleges and universities is still dominated by traditional big data technologies, with little involvement in cutting-edge technologies integrated by AI and big data courses. Even a lot of knowledge is not included in the teaching content, making it difficult for students to master cutting-edge industrial skills and adapt to the needs of industrial posts ^[8].

Meanwhile, most teachers’ teaching content lacks pertinence and practicality. Classroom teaching is still dominated by theoretical knowledge, lacking integration with actual industrial application scenarios and post-skills, resulting in difficulties for students to apply what they have learned to practical work and the frequent phenomenon of “disconnection between learning and application.”

In addition, the content connection between different courses is not close enough, easily leading to repeated teaching and fragmented content. Over time, it will be difficult for teachers to help students build a more systematic and complete knowledge system, greatly affecting the improvement of teaching effects ^[9].

2.3. Single teaching method with insufficient interaction and personalization

At present, many teachers still adopt the traditional teaching method of “teacher lecturing + PPT presentation” in Big Data Technology course teaching. This method is very monotonous and boring, lacking interaction and interest, making it difficult to stimulate students’ learning initiative and creativity. In classroom teaching, teachers usually dominate teaching activities, and students mostly accept knowledge passively, leading to a lack of opportunities for independent thinking and cooperative exploration, which greatly affects the development of their practical and innovative abilities ^[10].

Meanwhile, due to differences in students’ knowledge foundation and learning abilities, many traditional teaching methods are difficult to meet the learning needs of students at different levels. As a result, students with weak foundations cannot keep up with the teaching progress, while those with good foundations are “not full”, making it difficult to realize personalized development in teaching.

Furthermore, the integration depth of online and offline teaching is insufficient. Online teaching mostly focuses on knowledge explanation, making it difficult for students and teachers to carry out effective interaction. Offline teaching lacks intelligent auxiliary means, resulting in the failure to maximize teaching effects in big data major courses.

3. Innovative paths for AI-enabled Big Data Technology course teaching

3.1. Renewing teaching concepts and establishing the AI-integrated education concept

The renewal of teaching concepts is the premise of realizing teaching innovation. Therefore, colleges and

teachers should take the initiative to adapt to the development trend of the digital era and establish the teaching concept of “AI-integrated education”, so as to better integrate AI technology into the whole process of course teaching and gradually promote the transformation of teaching mode from “knowledge imparting” to “ability cultivation.”

To this end, colleges should further strengthen their attention to AI-enabled teaching, issue corresponding policy support and teaching reform guidance measures, so as to better clarify the goal and direction of integrating AI and Big Data Technology course teaching, and lay a solid foundation for the renewal of teachers’ teaching concepts^[11]. For example, colleges can set up a special group for the integration and reform of AI and teaching according to their actual situation to promote teaching reform in a more unified way. At the same time, schools should increase investment in AI teaching resources and practical facilities to provide a guarantee for subsequent AI-integrated teaching.

Teachers should change traditional teaching concepts and take the initiative to learn AI technology, gradually forming the concept of “AI-assisted teaching”. Teachers should fully understand the application value of AI technology in teaching and take the initiative to participate in exploring the integration paths and methods of AI and course teaching. Meanwhile, teachers should clarify their leading role in AI-integrated teaching and recognize the position of AI as an auxiliary tool, so that AI can be reasonably used to optimize the teaching process and improve teaching efficiency, avoiding the situation that AI technology replaces teachers’ teaching work^[12].

3.2. Optimizing teaching content and constructing an AI-integrated curriculum system

The optimization of teaching content is the core to improving the quality of AI-enabled Big Data Technology course teaching. Therefore, combined with the actual needs of industrial development and the iteration trend of AI technology, educators can construct an AI-integrated curriculum system for the Big Data Technology major, which can effectively realize the real-time update of teaching content and greatly improve the pertinence and systematicness of teaching content.

In actual teaching, educators should update course content in a timely manner and integrate cutting-edge technologies integrated by AI and big data. Colleges can organize teachers to conduct in-depth research on industrial enterprises to understand the skill requirements and technology development trends of more industrial posts, and take the initiative to incorporate technologies such as deep learning and natural language processing into course teaching content, which can effectively make up for the deficiencies of traditional teaching content^[13]. For example, in the teaching of *Big Data Analysis*, educators can try to integrate knowledge such as machine learning algorithms; in *Data Visualization*, educators can add content such as AI intelligent visualization tools.

In addition, educators need to further optimize the curriculum structure to realize the systematic integration of course content, which is conducive to breaking the barriers between traditional courses and making the connection and integration between different courses more reasonable and scientific. Teachers can try to build a four-dimensional curriculum system of “basic courses + core courses + practical courses + innovative courses.” Basic courses can focus on cultivating students’ basic skills in mathematics and computer; core courses can focus on cultivating students’ core big data skills and AI integrated application abilities; practical courses can mainly improve students’ practical operation abilities and project experience; innovative courses can focus on cultivating students’ innovative thinking and abilities, ensuring the

consistency between teaching content and students' development ^[14].

3.3. Innovating teaching methods and constructing an intelligent interactive teaching mode

Combined with the application characteristics of AI technology, to better realize the teaching innovation of the big data major, educators can try to construct an intelligent interactive teaching mode of “AI + online + offline”, which can effectively break the limitations of traditional teaching and help improve the interactivity and interest of teaching.

To this end, teachers can try to implement personalized teaching and use AI technology to realize “teaching students in accordance with their aptitude.” In class, teachers can build an intelligent teaching platform and collect data such as students' learning behaviors and progress through AI algorithm technology, so as to better analyze students' learning characteristics and weak points and provide support for the expansion of subsequent teaching content ^[15].

In terms of teaching methods, educators can try to adopt interactive teaching to better stimulate students' learning initiative. For example, educators can use AI virtual simulation technology to simulate the whole process of big data processing, and then let students conduct independent operation and cooperative exploration in a virtual environment, which can greatly improve their practical operation and cooperation abilities.

Furthermore, educators need to continuously promote the in-depth integration of online and offline teaching to maximize teaching effects. Online teaching can focus on knowledge explanation and resource push, while offline teaching can focus on practical operation and interactive discussion. Through AI technology, the interconnection and sharing of online and offline teaching data can be realized more efficiently. Teachers can grasp students' online learning situation in real time through the AI platform, so as to carry out more targeted offline teaching activities.

Students can supplement learning and consolidate knowledge through online platforms and improve their practical abilities through offline practice, gradually forming a teaching mode of “online autonomous learning + offline interactive practice.” In classroom practical teaching, educators can push case videos of big data and AI integration to students through online mode, and organize students to carry out case analysis and project practice offline, so that students can better apply online knowledge to offline practice and improve their learning effects.

Disclosure statement

The authors declare no conflict of interest.

References

- [1] Jiang YT, Wang JX, Tang NN, 2026, Research on Case Teaching Mode of Data Science and Business Analytics — Taking Data Science and Big Data Technology Major as an Example. *Achievements Collection of 2023 Annual Planning Projects of China Business Statistics Association (2nd Series)*, 80–84.
- [2] Liu HY, 2025, Research on the Training Path of Applied Talents for Data Science and Big Data Technology Major from the Perspective of New Quality Productive Forces. *Industrial Innovation Research*, 2025(19): 166–168.

- [3] Dang Y, 2025, Statistics and Analysis of College Students' Employment Intention Based on Big Data Platform — Taking Big Data Technology Major as an Example. *Office Automation*, 30(20): 123–125.
- [4] Han LR, Lu KF, Li XZ, 2025, Construction of Dynamic Evaluation Model for Practical Teaching Under the 1+X Certificate System — Research on the Adaptation Between Practical Teaching Standards and Industry of Big Data Technology Major. *Modern Vocational Education*, 2025(29): 85–88.
- [5] Chen CF, Zhou KQ, Ou Y, et al., 2025, Research and Practice on the Construction of Data Science and Big Data Technology Major. *Computer Education*, 2025(10): 251–257.
- [6] Ma T, Zhang JF, 2025, Construction of an Innovative Model for College Students' Mental Health Education Driven by the Synergy of AI and Big Data Technology. *Journal of Shenyang University (Social Science)*, 27(5): 54–61.
- [7] Zheng DC, 2025, Exploration and Practice on the Construction of Big Data Technology Major Under the Background of Artificial Intelligence. *China Computer & Communication*, 37(18): 176–178.
- [8] Li L, Yang JZ, 2025, Skill Competition Leading the Training of High-skilled Talents in Vocational Colleges — Taking Big Data Technology Major as an Example. *Technology Wind*, 2025(26): 142–144.
- [9] Shi M, 2025, Research on the Quality Evaluation of Talent Training for Big Data Technology Major Group Under School-Enterprise Cooperation Based on AHP. *China Computer & Communication*, 37(18): 242–244.
- [10] Hou HZ, Dai Y, Wei W, 2025, Teaching Cases of Big Data Technology Major in the Sino-German Advanced Vocational Education (SGAVE) Project. *Wisdom China*, 2025(S1): 183–185.
- [11] Wang RF, Cai ZS, Yi DR, 2025, Research on the Innovation of Curriculum System Construction for Data Science and Big Data Technology Major from the Perspective of Emerging Engineering Education. *University*, 2025(22): 123–126.
- [12] Wang YY, 2025, Research on Practical Teaching Reform From the Perspective of Competition Empowerment — Taking Data Science and Big Data Technology Major as an Example. *Journal of Shandong Technology and Business University*, 39(4): 118–128.
- [13] Zhu YC, 2025, Research on the Construction of Industry-Education Integration Base for Big Data Technology Major Under the Background of High-Quality Development. *Quality and Market*, 2025(7): 186–188.
- [14] Liu XZ, Liu YP, Lu Bm, 2025, Construction of an Innovative Talent Training System for Big Data Technology Major Under the Background of “Artificial Intelligence + Emerging Engineering”. *Henan Education (Higher Education)*, 2025(7): 57–58.
- [15] Shen WW, Xiao ZP, 2025, Innovation and Practice of Major Construction Based on the Integration of “Post-Course-Competition-Certificate” — Taking Big Data Technology Major as an Example. *Journal of Heilongjiang Ecological Engineering Vocational College*, 38(4): 142–146.

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