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# Research on the Teaching Path of Higher Vocational Big Data Technology Major Based on "Course Ideological and Political Education"

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**Abstract:** Based on the curriculum characteristics of the big data technology major, this paper explores the integration pathways of curriculum ideology and politics. It begins by re-designing the training objectives of the big data technology major and closely combining ideological and political teaching with professional curriculum instruction. The study optimizes the design of curriculum ideological and political implementation plans, identifies ideological and political elements within professional courses, innovates teaching methods for curriculum ideology and politics, and establishes a multi-dimensional teaching evaluation mechanism. The viewpoints and strategies discussed aim to support the implementation of ideological and political teaching in the big data technology major, achieving the organic unity of value shaping, ability training, and knowledge impartation.

**Keywords:** Curriculum ideology and politics; Big data technology major; Higher vocational teaching; Teaching reform

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## 1. Introduction

Moral education is the fundamental goal of China's educational initiatives. The integration of curriculum ideology and politics, along with the implementation of ideological and political work throughout the entire educational and teaching process, serves as a crucial pathway to promote moral education. In the era of big data, various challenges have emerged alongside societal development, including the lagging moral principles and legislative frameworks for big data. It is essential to guide the rapid development of big data technology based on Marx's ethics of science and technology [1].

In May 2020, the Ministry of Education issued the Guiding Outline of Curriculum Ideological and Political Construction in Institutions of Higher Learning, which positions the comprehensive promotion of curriculum ideology and politics as a strategic measure to fulfill the fundamental task of cultivating morality and talent. This highlights the significant importance of curriculum ideological and political construction.

For students in higher vocational colleges, their worldviews, life outlooks, and value systems are at a critical

stage of development. Through curriculum ideology and politics, it is essential to promote the organic unity of value shaping, ability training, and knowledge impartation. Teachers in higher vocational institutions must align their training objectives with the overarching question of "what kind of individuals to cultivate." They should identify and refine the ideological and political elements embedded within curricula, adopt a student-centered approach, and support the comprehensive development of students through curriculum ideology and politics.

## 1. Brief description of the connotation of curriculum ideology and politics

The connotation of curriculum ideological and political education lies in the integration of ideological and political education with professional knowledge teaching, utilizing the classroom as the main channel to embed ideological and political education throughout the entire teaching process. In essence, curriculum ideological and political education requires teachers to impart knowledge and skills while incorporating education on ethics, cultural awareness, and patriotic spirit. This approach guides students in developing a correct worldview, outlook on life, and values.

In constructing curriculum ideology and politics, moral cultivation must be regarded as the fundamental task. Teachers should integrate ideological and political education into every aspect of classroom teaching by selecting content rich in ideological and political significance and employing diverse teaching methods. This approach aims to achieve the organic unity of knowledge transmission and value guidance [2].

The characteristics of curriculum ideological and political education are primarily reflected in three aspects: integrity, integration, and practicality. Integrity signifies that curriculum ideology and politics permeate the entire teaching process, influencing every aspect of professional curriculum teaching. Integration refers to the blending of curriculum ideological and political content with professional curriculum teaching, encompassing teaching content, methods, and objectives to form a cohesive whole. Practicality emphasizes the focus on students' practical experiences, allowing them to deepen their understanding and recognition of ideological and political content through engaging in practical activities.

## 2. The teaching path of big data technology major in higher vocational colleges based on "Curriculum Thinking and Politics"

### 2.1. Adjusting teaching objectives based on the characteristics of the major

Big data technology is a crucial component of modern information science and technology and represents one of the most rapidly advancing fields within computer science and technology. By integrating theoretical knowledge with practical application, the big data technology major enables students to comprehend foundational concepts and theories while learning to extract valuable insights from massive datasets through data definition, manipulation, querying, control, and mining [3]. This discipline exhibits distinct characteristics, including strong theoretical foundations, engineering applications, systematic processes, and developmental potential.

The ideological and political curriculum should align with the characteristics of the major by exploring the rich ideological and political elements inherent to the field and focusing on professional talent training objectives. By analyzing the current state and future trends of big data technology, examining application cases, and discussing societal issues related to big data, it is possible to integrate knowledge dissemination with value guidance. This approach fosters students' critical thinking, value judgment, ideals, beliefs, and sense of responsibility.

Based on this analysis, the curriculum objectives for the big data technology major can be structured across three dimensions: knowledge, ability, and ideology/politics:

(1) Knowledge dimension: Students should understand the fundamental concepts and theoretical foundations of big data technology, recognize the status of big data development in China, cultivate a sense of patriotism, social responsibility, and a mission to leverage science and technology for national service.

(2) Ability dimension: Students should master the application methods of big data technology, develop resilience in the face of challenges, foster innovation, and embrace exploration.

(3) Teamwork and problem-solving: Students should learn to address learning challenges collaboratively, enhancing their innovation and teamwork skills.

(4) Professional ethics and spirit: Students should cultivate a craftsman-like spirit of excellence, professionalism, and adherence to ethical standards while understanding the quality expectations of relevant roles [4].

## 2.2. Optimizing the curriculum ideological and political implementation plan

The implementation process for curriculum ideology and politics can be divided into three stages: excavation, integration, and practice. These stages involve:

(1) Excavation: Identifying ideological and political elements within the curriculum.

(2) Integration: Designing a teaching plan that incorporates these elements into the professional curriculum.

(3) Practice: Implementing the identified ideological and political components in classroom teaching.

Through these stages, the curriculum achieves the organic unity of value shaping, ability training, and knowledge dissemination, ensuring that the educational goals are effectively met.

### 2.2.1. From point to surface: In-depth exploration of curriculum ideological and political elements

Curriculum ideology and politics should be integrated throughout the entire learning process of the big data major. By using course content as a vehicle for uncovering ideological and political elements, teachers can identify integration points where these elements can be seamlessly incorporated. Such points can be found in aspects related to big data culture, the development and current applications of database technology, case studies, and research trends. The exploration should extend from specific points to broader applications, ensuring that the ideological and political elements identified resonate across the curriculum. These elements may include themes such as patriotism, devotion to one's country, a spirit of exploration, and positive innovation. Effective identification of these elements facilitates the advancement of ideological and political construction in subsequent courses [5].

For instance, in teaching the SQL standard language course, teachers can present stories of scientific research involving notable scientists to highlight ideological and political elements. Don Chamberlin, the creator of the SQL language and known as the father of the relational database standard language, initially worked on the System A research project, which failed. He then shifted his research direction, ultimately achieving significant success. From this example, teachers can guide students to appreciate Chamberlin's resilience and willingness to explore new ideas despite setbacks. Similarly, mathematician Edgar Codd conceptualized the relational database model independently at a time when the idea was regarded as unconventional. Nonetheless, this concept laid the groundwork for SQL, a critical language in relational database systems. Teachers can draw on this story to instill in students the importance of innovation.

Additionally, teachers may explain the process behind establishing Chinese database standards to emphasize the strategic importance of overcoming technological challenges and avoiding dependence on foreign technology. This can inspire students to develop a sense of national pride and a commitment to contributing to their country through technological advancements [6].

### 2.2.2. Innovative teaching methods: Seamless integration of ideological and political education into the curriculum

Teaching strategies should align with curriculum objectives and characteristics while adhering to the developmental patterns of students' cognitive and practical abilities. Given the practical and logical nature of the big data technology major, teaching methods should integrate theoretical and practical learning. Modular teaching design can also be adapted to enhance students' comprehension of course content and foster logical thinking. Effective teaching methods for curriculum ideological and political education include hybrid teaching models that combine online and offline approaches, incorporating micro-videos, MOOCs, and flipped classrooms. Additional strategies involve case analysis, situational teaching, classroom discussions, online assessments, and group collaborations. These approaches allow ideological and political education to be subtly embedded into the curriculum, achieving impactful outcomes in a seamless manner [7]. Innovative teaching methods emphasize the active role of students in the learning process, enrich their learning experiences, and create engaging and interactive classrooms.

For instance, when addressing China's solution to the bottleneck challenge in database technology, teachers can utilize micro-lessons to introduce multi-model databases such as ArangoDB. These micro-lessons, concise and focused, can effectively convey key points in just a few minutes. They can present the development background, data processing features, and scientific significance of database technologies, including relational databases and multi-model databases like ArangoDB. This approach helps students understand the vital role of database technology in the big data era and the increasing market share of domestic databases developed in China. Examples such as the adoption of the GoldenDB database by large enterprises like China Construction Bank and China Mobile underscore the growing preference for domestic solutions. Tencent Cloud's TDSQL database, which achieved a performance score of 72.6 million, serves as an additional case highlighting the significant improvements in domestic database performance, rivaling international counterparts in core technology and stability.

Through such examples, students gain an understanding of the progress in domestic big data foundational software, as well as its ability to replace foreign software such as Oracle and IBM. This knowledge reinforces the notion that the bottleneck issues in big data technology are being effectively addressed. Students develop an appreciation for the strategic importance of domestic software, fostering a sense of urgency and responsibility. Teachers can then facilitate class discussions to further emphasize the rise and development of domestic technology, instilling national confidence and a sense of duty toward supporting technological advancement.

### 2.2.3. Combining theory and practice to cultivate and enhance ideological and political competence

Practical courses constitute a vital component of the curriculum system for the big data technology major. These courses emphasize the application of big data technology in diverse fields such as medicine, industry, statistics, and economics. Textbooks are selected to reflect global trends and advancements in big data technology and applications. Priority is given to textbooks developed under pilot course reform initiatives in colleges, combining

optimized teaching content with insights from artificial intelligence and data science [8].

In practical course instruction, teachers are encouraged to adopt a multi-level and progressive approach tailored to students' learning stages. This involves a combination of independent practice and group collaboration, encouraging students to use real-world problems as starting points for task-driven, collaborative practical activities [9]. Such activities promote innovative thinking and teamwork, as students develop and propose creative solutions to experimental challenges.

Teachers can categorize experiments into four types: demonstration, operation, verification, and comprehensive design. The first three types are performed individually, while comprehensive design experiments are conducted in group settings. For instance, in data visualization courses, students progress from learning about various types of visual charts to drawing multiple sub-graphs, combining charts, and adding interactive components and chart linkage [10]. This step-by-step approach ensures a seamless integration of theoretical knowledge with practical skills. By applying knowledge to real-world data science projects, students gain insights into industry-specific requirements while developing technical proficiency in tools such as Hadoop, Spark, and Hive [11].

In programming courses, teachers can design tasks such as "Case Exploration of Machine Learning Models Using Python Programming Language." Students, organized into groups, can select datasets from specific industries, user behavior data, or public datasets to perform operations such as data acquisition, cleaning, preprocessing, analysis, feature extraction, algorithm selection, model construction, and evaluation. Within the groups, students collaborate through problem analysis, literature review, discussion, and division of labor. This process enhances their inquiry and collaboration abilities while fostering a deeper understanding of real-world applications of big data technology.

## 2.3. Designing a multi-dimensional curriculum evaluation system based on curriculum ideology and politics

Learning evaluation should consider not only students' final academic performance but also their performance throughout the learning process. It is therefore essential for higher education institutions to establish a multi-dimensional evaluation system that emphasizes the balance between theory and practice, as well as process and results. Such a system enables a comprehensive assessment of student's ability to apply knowledge and their overall accomplishment. The course evaluation includes two components: a final examination and process assessment, with the total score calculated as follows: normal score (20%) + experiment (20%) + final score (60%). The evaluation indicators also integrate ideological and political aspects, assessing students' ideological and political competencies [13,14].

The process assessment evaluates students' grasp of fundamental database concepts and theories through homework, class participation, and performance on MOOC platforms. This evaluation aligns with course objectives 1 and 3, assessing students' learning attitudes through metrics such as time spent learning and the quality of assignments.

The final examination primarily evaluates students' proficiency in tasks such as database creation, data querying, updating, and controlling, as well as their comprehensive skills in database design and implementation. This component supports the achievement of course objectives 2 and 3. The comprehensive nature of the final examination ensures alignment with the teaching objectives and provides a well-rounded evaluation of students' capabilities [15].

## 3. Conclusion

The influence of curriculum ideology and politics in teaching practice has grown significantly after years of exploration and discussion. This paper proposes an ideological and political construction plan for the curriculum of the big data technology major. It emphasizes the importance of identifying ideological and political elements that are closely related to the internal logic of course knowledge points and reflective of contemporary trends, while also building a comprehensive case base for curriculum ideology and politics.

In terms of teaching method innovation, various instructional strategies are recommended to achieve an organic combination of ideological and political education with knowledge transmission. Additionally, the construction of a multi-level experimental teaching system is proposed to enhance students' abilities and overall development effectively. Furthermore, a multi-dimensional evaluation system encompassing knowledge, skills, and quality has been established to ensure holistic assessment.

The outcomes include increased student enthusiasm for learning, an active classroom atmosphere, and enhanced engagement in class discussions and group collaborations. Students not only advance their professional knowledge but also develop their professional ethics and standards. This approach fosters a deeper sense of social responsibility and national pride, achieving the organic unity of value shaping, knowledge imparting, and ability cultivation.

## Disclosure statement

The author declares no conflict of interest.

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