

Research on the Path and Mechanism of Curriculum Ideological and Political Construction of Higher Vocational College Students Empowered by Digital Technology

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Abstract: This paper takes the path and mechanism of higher vocational students' curriculum ideological and political construction enabled by digital technology as the research object, and identifies the actual state, problems and obstacles of the development of higher vocational students' curriculum ideological and political construction based on literature analysis and field investigation and interview. Make clear the development goal and strategic orientation of the curriculum ideological and political construction of higher vocational students empowered by digital technology. The construction of digital technology enables the implementation of ideological and political curriculum construction for vocational college students. At the same time, facing the national "14th Five-Year Plan" development plan and the development goal of "China's Education Modernization 2035", the paper designs the realization path and key tasks of the curriculum ideological and political construction of higher vocational students empowered by digital technology, and puts forward the driving mechanism and policy suggestions of the curriculum ideological and political construction of higher vocational students empowered by digital technology.

1. Introduction

As a new production factor, digital technology is moving from superposition to integration and symbiosis with the field of education, enabling and reshaping the form of education, and promoting the digital transformation of the whole field of education with all elements, all structures and all systems. The report of the 20th National Congress of the Communist Party of China put forward the requirements of "promoting the digitization of education and building a learning society and a learning country with lifelong learning for all". This indicates that the digital transformation of education has become an inevitable trend, which provides development opportunities for the ideological and political construction of high-quality courses in colleges and universities[1].

Curriculum ideological and political construction is not only an important position to enhance the attractiveness and appeal of the socialist core value system, but also an inevitable choice for higher education to reshape its own ecology and achieve high-quality development. However, in the course of implementation, vocational college students still face problems such as backward thinking, incomplete system design, weak technical support, lack of ethical norms, etc., showing the typical characteristics of "idea lag, system fragmentation, technical limitations". How to use digital technology has become the key to the ideological and political construction of higher vocational college students[2]. To sum up, it is urgent to study the path and mechanism of curriculum ideological and political construction of higher vocational students empowered by digital technology.

2. The existing problems of ideological and political construction of higher vocational college students' curriculum

2.1. The "two skins" phenomenon of professional teaching and ideological and political education is still significant

It is one of the core points of curriculum ideological and political construction to realize the deep organic integration of professional teaching and ideological and political education, and fully activate the educational potential contained in the teaching of professional courses. Although the ideological and political concept of curriculum has been carried out for a long time, the current practice in colleges and universities still presents different degrees of separation between professional teaching and ideological and political education. In the course design process, the teaching syllabus of professional courses often focuses on the imparting of knowledge and skills, without fully considering the goal of ideological and political education, and the integration of ideological and political elements is random and scattered, lacking systematic planning; In the process of teaching implementation, teachers mostly focus on the explanation of professional knowledge and regard ideological and political education as an extra task, which cannot be promoted simultaneously and echo each other, and it is difficult to form a pattern of education in which ideological and political courses complement each other and make concerted efforts[3]. This urgently requires universities and teachers to unswervingly uphold the principles of both knowledge imparts and value guidance, and the combination of explicit education and implicit education. On the basis of the fact that professional teaching and ideological and political education are already in the same direction, they should further explore the depth of integration, and promote the deep integration of the two by optimizing course design, innovating teaching methods and other means, so as to finally achieve collaborative innovation. To achieve professional teaching and ideological and political education two-way empowerment, create a new education pattern[4].

2.2. The course of ideological and political implementation is still in a chaotic and unclear state

Promoting the full implementation of curriculum ideology and politics is the key point for colleges and universities to carry out the fundamental task of cultivating virtues and talents. With the help of curriculum ideology and politics as a powerful tool, professional teaching and ideological education can be combined in a game of chess, which can greatly improve the overall effect of college education[5]. However, looking at the present, the research results and practical exploration of the existing curriculum ideology and politics have encountered numerous obstacles in the process of landing and transformation. On the one hand, there is a lack of systematic thinking in the linkage of major, curriculum and classroom. At the professional level, the layout of

ideological and political education is not coordinated from the perspective of macro professional group construction. All majors are independent and the curriculum ideological and political construction lacks coherence and coordination. At the course level, the ideological and political construction of a single course lacks an overall plan, teaching objectives are vague, teaching content is fragmented, and teaching methods are not targeted, which makes it difficult to form an organic whole to continuously promote ideological and political education[6]. At the classroom level, teachers' teaching is very arbitrary, and they do not refine the ideological and political ideas of the curriculum into standardizing the classroom operation process, and integrate ideological and political elements in improper timing and ways, resulting in chaotic implementation paths. In view of this, the construction of "professional-course-classroom" top-down, layer by layer, coordinated implementation approach, to promote the implementation of curriculum ideology and politics in an all-round and systematic way, has become an urgent practical demand to improve the effectiveness of college curriculum ideology and politics[7].

2.3. There are many imperfections in curriculum ideological and political evaluation methods

Curriculum ideological and political evaluation, as a key activity to accurately judge the effect of curriculum ideological and political implementation, is always a difficult point in curriculum ideological and political construction. With the rapid development of information technology, the wave of digital transformation has swept the field of education. With the full help of digital technology, it has become the only way for the development of curriculum ideological and political evaluation to vigorously carry out digital evaluation of college curriculum. However, many thorny problems need to be solved in the practice of digital evaluation of curriculum ideology and politics. First of all, in the data collection process, it is not clear what key data indicators should be focused on in order to comprehensively and accurately reflect the effectiveness of ideological and political education[8]. Data such as academic performance and attendance records, which are relied on by traditional teaching evaluation, are far from covering the hidden results such as value shaping and moral cultivation concerned by ideological and political education. Instead, multi-dimensional data collection, such as the expression of students' values in classroom interaction, the practice of professional ethics in practical projects, and the improvement of ideological and political literacy in extracurricular expansion learning, are collected[9], this not only lacks unified standards and procedures, but also faces limitations and difficulties in technical means, personnel, and other aspects. Secondly, in terms of data flow, even if part of the data is collected, due to the lack of professional data management and analysis talents, as well as supporting efficient data flow platforms and tools, the data is not transmitted smoothly between different departments and different links, it is difficult to achieve effective integration and sharing, and it cannot provide a solid data foundation for subsequent evaluation and analysis. Finally, in the process of data utilization, there is no broad consensus among colleges and universities on how to build a scientific and reasonable evaluation model based on the collected and circulated data, accurately mine the ideological and political education information contained behind the data, and then provide targeted and highly operational improvement suggestions for the construction and implementation of curriculum ideological and political education[10]. In addition, there are also many problems that need to be optimized in the evaluation process of man-machine collaborative evidence-based diagnosis and reform centered on curriculum ideological and political construction and implementation, such as the lack of teachers' proficiency in the application of intelligent technology, the unclear division of human-machine labor, and the non-standard collaborative process, which need to be further improved.

3. Digital technology to enable higher vocational students curriculum ideological and political model construction

The top-down promotion of "major - curriculum - classroom" provides a breakthrough point for the integration of ideological and political elements, and solves the problem of how to construct curriculum ideological and political elements; Intelligent technologies supported by 5G network, big data, AIoT and edge computing provide digital power for the implementation of curriculum ideology and politics, and promote the bottom-up dynamic planning of "classroom data set - curriculum portrait chain - professional competence stack" of curriculum ideology and politics through data flow, aiming to respond to the problem of how to transform curriculum ideology and politics[11]. Under the guidance of the implementation concept of curriculum ideology and politics in colleges and universities empowered by digital transformation, this study focuses on the main battlefield of curriculum construction, builds a "two-way connection" implementation model of curriculum ideology and politics in colleges and universities empowered by digital transformation according to the relevant requirements of the Guiding Outline of Curriculum Ideology and Politics Construction in Colleges and universities, and combines the integration point of curriculum ideology and politics in colleges and universities empowered by digital transformation.

3.1. Classroom data set: classroom teaching perception multi-modal data

Within the context of educational research and practice, datasets have a clear and critical definition. It is essentially a faithful, unprocessed summary of the original record of a student's learning state at a precise moment in a classroom situation. These records are like "cornerstone materials" in the field of education, reflecting students' learning style at that time in an all-round way, covering knowledge acquisition progress, learning concentration, classroom interaction performance and many other aspects, and are the core basis for in-depth analysis of students' learning process. In today's era, the frontier research field of artificial intelligence is developing at an unprecedented speed. This trend has opened up a new vision for the intelligent perception of educational data, and has given a variety of technical support means. First of all, sensor technology plays a fundamental role as the "frontier sentinel" of data acquisition. With its high sensitivity, it can accurately detect students' explicit behavior in class. For example, cameras capture students' body movements to judge their enthusiasm for participating in class discussions or group activities; The frequency and volume of students' speech were recorded by microphones to evaluate their activity in knowledge exchange[12]. These explicit behavioral data intuitively present students' immediate feedback on what they are learning. AIoT (Artificial Intelligence Internet of Things) technology greatly expands the boundaries of data perception. It constructs an interconnected intelligent perception network that not only tightly integrates traditional IoT devices with artificial intelligence algorithms, but also monitors various physical environmental elements in the classroom in real time, forming accurate scene data, such as the impact of indoor temperature, humidity, and lighting conditions on students' learning comfort, as well as the relationship between spatial factors such as table and chair placement and teaching equipment layout and students' learning psychology. It can also be extended to the intelligent learning terminal carried by students to track and record their operation trajectory in the electronic learning process, such as the emphasis on the electronic textbook, the browsing time, the correct and wrong rate of the online learning platform, and other information, providing a comprehensive insight into the learning habits of students from multiple perspectives[13]. Edge computing technology innovates the traditional data processing process for the timeliness and mass of educational data.

Considering the explosive generation of data in the classroom environment, if all the processing depends on the cloud central server, it will inevitably cause transmission delay and computing

power bottleneck[14]. Edge computing needs to transfer some computing tasks to edge devices close to the data source, such as local intelligent cameras and sensor nodes with computing functions, and first perform preliminary feature extraction and simple analysis on the collected data. For example, real-time recognition of students' facial expression images, preliminary assessment of their emotional state, and rapid feedback to teachers ensure timely data processing, enabling teachers to adjust teaching strategies in real-time based on students' learning emotions. Learning analysis technology focuses on exploring the deep psychological and cognitive factors behind students' learning behavior, and is a "deep detector" of educational data intelligent perception[15]. It is committed to analyzing students' implicit physiological data, which is like a "secret password" of students' inner state, such as the heart rate change monitored by wearable devices, which can reflect the degree of tension in the face of knowledge difficulties[16].

3.2. Curriculum portrait chain: curriculum implementation insight multi-scene portrait

In the context of the deep integration of modern educational technology and curriculum teaching, portrait chain has a unique and critical connotation. It is a kind of complex information carrier specially used to accurately describe the continuous learning process of students in one course or even multiple courses, which is concretely represented as a visual semantic network constructed by using specific technical means through data sets collected at different stages and different dimensions. This network is not a simple pile of data, but a structured presentation with internal logical connections that can reflect the full picture of student learning. With the rapid development of information technology, big data technology is playing an increasingly important cornerstone role in the field of education[17]. It can efficiently store, manage and quickly retrieve massive, diversified and dispersed educational data. These data are derived from students' rich and diverse learning scenarios such as classroom listening, group discussion, homework, online learning platform interaction and extracurricular practice, and comprehensively cover all aspects of students' learning behavior[18]. Through the deep mining of big data technology, valuable information fragments can be extracted, such as the frequency of students participating in different types of classroom activities, the time spent on various learning tasks, the accuracy rate of answers to different knowledge blocks and other detailed data, which constitute the basic materials for the construction of the portrait chain. Learning analysis technology focuses on in-depth insight into the data sets generated by students in different learning scenarios, and interprets the learning state of students from multiple levels. On the one hand, the individual characteristics of students are accurately depicted, including hard indicators such as students' age, gender, basic differences in disciplines, and characteristics of knowledge reserves precipitated by past learning experiences[19]. These characteristics provide basic references for the formulation of subsequent personalized education strategies. On the other hand, in-depth analysis of students' cognitive learning situation, detailed exploration of students' performance in knowledge understanding, memory, application and innovation and other cognitive links, such as by analyzing the score trend of students in the advanced knowledge test, to determine the rate of improvement and bottleneck of their cognitive ability[20].

3.3. Professional ability stack: professional training and shaping multi-dimensional ability

Under the framework of rigorous and systematic talent training system in higher education, the ability stack plays a pivotal role, which has a highly clear and core position. It defines in a precise and scientific way the organic integration of a series of abilities that students should possess after successfully completing the whole process of professional learning. When examining the comprehensive evaluation dimension of educational effectiveness from a macro level, the role

played by the ability stack can not be underestimated. It can not only intuitively and accurately map the actual effect achieved by students' absorption degree in the process of learning professional knowledge and proficiency in professional skills, but also become a key measurement scale that accurately reflects the final implementation effect of teachers' ideological and political education work. The internal logic behind this is that the comprehensive ability complex displayed by students at the time of graduation is in essence the precise transmission of knowledge in professional teaching links, the systematic training of skills and the in-depth shaping of the value that ideological and political education is committed to achieve. These three synergies and interactive influences are finally presented in visible form. In view of this, the pursuit of all-round vigorous development of students' multi-dimensional ability has been established as the guiding goal of educational practice, and then vigorously strengthen the effective integration between the two key sectors of professional teaching and ideological and political education has become the only way for the development of current higher education. First of all, in-depth analysis of the hidden diversity and rich value of education data is the most important.

As a programmatic guiding document in the entire educational process, the talent training program clearly covers a series of key requirements with pillar significance, such as political identity, knowledge level, practical ability and professional accomplishment. In the implementation at the specific operational level, it is necessary to weave the surface of the implementation strategy based on the internal logic of these requirements, closely related to each other, and orderly starting from the connection points to the lines. Take the key links in the construction of the professional curriculum system as an example for in-depth explanation. For core courses in a certain professional field, in the initial setting of curriculum objectives, on the one hand, the core points of knowledge and skill imparting should be clearly defined, so as to accurately correspond to the cultivation needs of knowledge level and professional quality. On the other hand, it is more necessary to rely on keen educational insight to accurately anchor the knowledge nodes in the curriculum content system that can effectively bear the responsibility of cultivating political identity.

After entering practical teaching, it is necessary to carefully design task modules that integrate ideological and political elements according to the characteristics of the practical projects planned and designed in the curriculum, so that students can simultaneously exercise their practical abilities, promote the sublimation of their ideological realm, and achieve organic synergy between key requirements and coherent and solid implementation effects. To further expand, it is essential to fully leverage the crucial role of data throughout the entire education process. Throughout the entire process of professional training, it is necessary to utilize advanced technologies such as big data and learning analytics to accurately track and firmly grasp the emergence, evolution, and dynamic changes of students' ideological and political literacy. The specific operation path can be started from the basic ideological and political assessment data carried out by students at the beginning of enrollment, and on this basis, an individual's personal ideological and political growth file can be established to continuously and systematically record the dynamic changes in students' ideological and political performance reflected in various aspects such as learning different courses, actively participating in campus activities, and participating in social practice.

Based on these precise insights obtained through rigorous data collection and in-depth analysis, it provides scientific and accurate guidance for many key links such as the best time to choose the ideological and political elements to integrate into professional teaching, the selection of appropriate integration methods, and the reasonable integration and in-depth control. At the same time, it also carefully builds a solid and reliable quantitative basis for objectively and fairly evaluating the effectiveness of ideological and political education. It is necessary to ensure that professional teaching and ideological and political education work together on the same track, move

forward together, and ultimately help students grow into high-quality talent models who closely adapt to the needs of the times and possess both morality and ability.

4. Conclusions

This study focuses on the path and mechanism of the curriculum ideological and political construction of higher vocational college students empowered by digital technology. Through literature analysis, field investigation and interview, it deeply analyzes the current status, problems and obstacles of the curriculum ideological and political construction of higher vocational students. This paper makes clear the development goal and strategic direction of vocational college students' curriculum ideological and political construction under the digital technology empowerment, and constructs the corresponding implementation model.

The research finds that there are many problems in the curriculum ideological and political construction of higher vocational college students. The phenomenon of "two skins" between professional teaching and ideological and political education is obvious, and the deep organic integration of the two is insufficient. The curriculum design lacks systematic planning of ideological and political education, and the coordination of teaching implementation is poor. It is urgent for colleges and teachers to adhere to the principle of attaching equal importance to knowledge imparts and value guidance, optimize curriculum design and innovate teaching methods to achieve two-way empowerment. The process of ideological and political implementation is confused and unclear, the interaction between majors, courses and classes lacks systematic thinking, the coherence and coordination of curriculum ideological and political construction is lacking, and teachers' teaching is very arbitrary. Therefore, it is urgent to build a "professional-course-classroom" multi-level collaborative implementation method to promote the implementation of curriculum ideological and political implementation in an all-round way. There are also many imperfections in curriculum ideological and political evaluation methods, such as unclear key indicators of data collection, lack of unified standards and processes, poor data flow, difficult to achieve effective integration and sharing, lack of scientific evaluation model to build consensus in data utilization, and need to optimize man-machine collaborative diagnosis and reform process.

To solve these problems, digital technology enabled vocational college students curriculum ideological and political model construction provides an innovative solution. The bottom-up dynamic planning of "classroom data set - curriculum portrait chain - professional competence stack" relies on intelligent technologies such as 5G network, big data, AIoT and edge computing to inject digital impetus into curriculum ideological and political implementation. With the help of a variety of cutting-edge technologies, the classroom data set can comprehensively perceive the multi-modal data of classroom teaching and reflect the learning status of students in real time. The curriculum portrait chain uses big data and learning analysis technology to accurately depict the overall picture of students' learning in multiple scenarios, and gain insight into individual characteristics and cognitive learning. The professional ability stack defines the organic integration of multi-dimensional abilities that students should have after professional study in the talent training system of higher education. Guided by the talent training plan, it strengthens the effective integration of professional teaching and ideological and political education, tracks the dynamic changes of students' ideological and political literacy through the whole process with the help of data technology, and provides precise guidance for the integration of ideological and political elements into key links of professional teaching. Build an objective and fair quantitative basis for evaluation, and help students grow into high-quality talents with both morality and talent.

Looking forward to the future, in the face of the national "14th Five-Year Plan" development

plan and the development goal of "China's Education Modernization 2035", the curriculum ideological and political construction of higher vocational students empowered by digital technology still needs to be continuously promoted. On the one hand, we should further deepen the integration of technology and education and teaching, fully tap the potential of digital technology, and optimize every link of curriculum ideological and political construction; On the other hand, all parties should cooperate, and colleges, teachers, technology research and development personnel and education management departments should form a joint force to jointly improve the driving mechanism of curriculum ideological and political construction, implement policies and suggestions, promote the curriculum ideological and political construction of higher vocational students to a new level, and lay a solid foundation for training high-quality and skilled talents to meet the needs of The Times.

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