




Research and Practice on the Ideological and Political Digitization System of Medical Laboratory Technology Curriculum Based on Distributed Data Processing

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Abstract. Digital technology is an important starting point of China's education and teaching reform. Through research and practice, the team clearly takes digital technology as the starting point, the spirit of medical craftsman as the ideological and political goal of the course, adopts the processing technology of horizontal fragmentation and vertical fragmentation to realize the distribution of processing, storage distribution and function distribution, and forms the digital distributed database system of "double main line and double level" course content. By using digital technology and visualization simulation, animation simulation, visual simulation, virtual reality and other technologies, the team has established the digital method and path of "five steps" course ideological and political construction. It has built first-class online and offline hybrid courses, high-quality online open courses and micro-courses of provincial universities, and independently developed virtual reality simulation software containing medical ethics. The formation of "four prominent" teaching methods, so that curriculum teaching and ideological and political education integration of more diversified, more detailed integration process. Highlighting digital technology, curriculum knowledge and skills training and curriculum ideological and political education double effect, has been widely praised by students, peers inside and outside the school and industry personnel.

Keywords: Digital technology · Curriculum ideological and political · Distributed data processing · Teaching mode · Method path

1 Introduction

In order to implement such documents as "Opinions on Strengthening and Improving Ideological and Political Work in Colleges and Universities under New Situation", "Guidelines for Ideological and Political Construction in Colleges and Universities" and the spirit of the National Conference on Ideological and Political Work in Colleges and Universities [1], promote the reform and innovation of Ideological and political courses, and constantly enhance the ideological and political courses' ideological, theoretical, friendly and pertinence [2]. To promote the professional courses and ideological and

political theory courses in the same direction, gradually build a medical laboratory technology professional group curriculum ideological and political system with rich types, progressive levels and mutual support. The author and his team took the basic course of biochemistry in medical laboratory technology group as an example, and made full use of digital technologies such as online classroom and virtual simulation to carry out ideological and political research and practice in the course.

Biochemistry is a general basic course for students majoring in medicine and health. It is a basic language to explain the mystery of life. Online classroom, virtual simulation and other digital technology is an important starting point of modern teaching reform. The use of digital technology to break through the major and difficult points of ideological and political courses in medical laboratory technology professional groups is conducive to teachers' teaching and students' learning, and is conducive to improving the education effect.

2 Present Situation of Curriculum Ideological and Political Digital Teaching of Professional Basic Courses [3]

2.1 The Ideological and Political Consciousness of Digital Courses is not Strong in Teaching

In terms of educational philosophy, the relationship between knowledge imparting and value leading cannot be accurately understood, especially the role of digital technology in the teaching process. In teaching, they often pay more attention to knowledge imparting itself, ignore the responsibility of education, and do not pay attention to the help of digital technology for education. They believe that ideological and political education is the responsibility of counselors and ideological and political teachers, and it has nothing to do with professional teachers. Professional teachers are not good at using digital technology to improve the effect of ideological and political education.

2.2 Insufficient Digital Upgrading of Ideological and Political Elements of the Course

The degree of ideological and political elements mining directly affects the effect of curriculum ideological and political construction. For a long time, teachers of specialized courses have been paying attention to the cultivation of professional skills in classroom teaching, but lack the experience of exploring ideological and political elements, especially using digital technology to upgrade the ideological and political elements of courses. Teachers of professional courses are not clear about the content of ideological and political education and are not familiar with the skills of ideological and political education. As a result, the mining of ideological and political elements is not enough, and the application of digital technology of ideological and political education in courses is also unfamiliar. In addition, the knowledge structure of some teaching materials used in teaching is abstract, which is quite different from the actual working scene, which is not conducive to teachers to fully explore the corresponding ideological and political education resources, and does not fully combine modern digital technology to display the teaching content.

2.3 It is not Natural for Curriculum Ideological and Political Elements to be Integrated into Classroom Teaching

In teaching, teachers of specialized courses fail to find the appropriate match point between ideological and political elements and professional curriculum knowledge and skills, and do not make good use of the role of digital technology in ideological and political education in class. If professional knowledge is taught first, and then moral education is abruptly supplemented, the new generation of students cannot accept it without adequate and necessary modern digital technology integration. Whether ideological and political elements can be naturally integrated into the teaching process depends on whether teachers can accurately find the coincidence point between curriculum ideological, political elements and professional curriculum knowledge, and on the full application of digital technology in the course of ideological and political teaching.

3 Exploring the Integration Path of Digital Technology in Curriculum Ideology and Politics [4, 5]

3.1 Implement the Integration Path of “FIVE-Step” Curriculum Ideological and Political Digital Technology

First, five layers of progressive integration into the whole process. Big data technology is used to promote the digitization of ideological and political elements of the curriculum, and then integrate them into the training program, curriculum standards, classroom teaching, teaching resources and course assessment, and establish the corresponding database. Second, expand resources and build brands. Using short video, virtual simulation, dynamic web page and other digital technologies, the construction of wonderful micro lessons, virtual simulation, new form of teaching materials, industry cases and other resources. Third, enrich activities and expand interests. By using remote video, synchronous online, virtual reality and other digital technologies, activities such as “little doctor apprenticeship”, “small scientific research and big innovation”, “one minute innovation” and “reader reading”, have been carried out to improve the vitality of ideological and political education in the curriculum.

3.2 Improve the Digital System of “DOUBLE Main Lines and Double Levels” Course Content [6, 7]

Curriculum teachers, ideological and political teachers, and digital technicians formed a team to analyze the requirements of medical professional courses in the guidelines for the construction of ideological and political courses in colleges and universities, as well as regulations in the code of conduct for practitioners in medical institutions. Through practice, the author and his team have studied and determined that the ideological and political core of the biochemistry course should be “firm ideals and beliefs” and “sincere doctors”, the medical ethics of “people-oriented, law-abiding, pioneering and innovative, biosafety, fair and honest” and the medical craftsman spirit of “exquisite technology” as the main elements of the ideological and political curriculum. Through the teaching practice of digital technology upgrading, the knowledge and skills contents

Table 1. Distributed information processing algorithm of curriculum ideological and political elements data

| Corresponding element | Algorithm code |
|---|---|
| Ideological and political main elements of the course | <pre> host=['ch01','ch02','ch03','ch04'] for i in range(len(host)): rplist = host[i:3+i] rlen = len(rplist) if rlen < 3: rplist = ['sh' + str(i)] + rplist + host[:3-int(rlen)] print(rplist) else: print(['sh' + str(i)] + rplist) </pre> |

of the first layer and four aspects are gradually refined to form the second layer and 13 specific digital knowledge and skills units. Moreover, the first layer and 6 aspects of curriculum ideological and political elements are refined to form the second layer and 11 specific ideological and political points of digital curriculum. The unit of knowledge and skills corresponds to the ideological and political points of digital curriculum, and gradually builds a “double main line and double level” curriculum content digital system. For example, knowledge and skills units such as “basic skill training, basic skill assessment, blood glucose measurement, total protein measurement, cholesterol measurement” correspond to ideological and political points of micro-video and virtual simulation courses, such as “laboratory biosafety and technical excellence”. Four server copy sets are adopted, and the algorithm in Table 1 is used to realize distributed processing and storage of ideological and political element data of the course, ensuring the objectivity of use.

4 Optimizing Curriculum Ideological and Political Digital Teaching Resources [8, 9]

4.1 Perfect Digital Teaching Resource Library

Relying on three national vocational education professional teaching resource banks and one provincial vocational college professional teaching resource bank, curriculum ideological and political cases containing the medical ethics of “people-oriented, law-abiding, pioneering and innovative, biosafety, fairness and integrity” are integrated into it. By using digital technology, it has built digital teaching resources such as animation, video, micro-class and virtual simulation, and has been recognized as a first-class online and offline hybrid course and high-quality online open course at the provincial level. For example, in the development of ideological and political teaching resources of lipid metabolism knowledge and skills unit course, hyperlipidemia and atherosclerosis were taken as “corresponding points”, and the digitalization of resources of “in order to

Table 2. Distributed information processing algorithm of digital teaching resource data

| Corresponding element | Algorithm code |
|--|--|
| Animation, video, micro lesson, virtual simulation | <pre> host=['ch01','ch02','ch03','ch04'] port = ['9001','9002','9003','9004'] rplist_all = [] for i in range(len(host)): rplist = host[i:3+i] rlen = len(rplist) if rlen < 3: rplist = list(rplist + host[:3-int(rlen)]) rplist_all.append(rplist) else: rplist_all.append(rplist) print(dict(zip(port,rplist_all))) </pre> |

reduce people's medical costs, the state focuses on improving the ability to guarantee drugs for major diseases, and promotes the inclusion of a variety of cardiovascular and cerebrovascular drugs such as arteriosclerosis into the National Basic Medical Insurance Drug List" was made into a short video. As a "bridge", it integrates into the ideological and political points of the "people-oriented, Wholeheartedly serving the people's Health" course, and makes micro-videos into the teaching links of the course. For the data of ideological and political elements of the course, fragmentation technology is adopted, and the algorithm in Table 2 is applied to realize that the same fragmentation corresponds to the same port. Each shard is composed of three types of element data. Data of different types of elements in the same shard are stored in different servers.

4.2 Construction of Virtual Simulation Digital Training Resources

Relying on the provincial demonstration virtual simulation training base, it independently innovates and develops virtual reality simulation platforms such as clinical laboratory and clinical laboratory of primary hospitals containing medical ethics. Modern information technology is used to simulate the workplace environment and real operation process of medical laboratories, to match the post standards of clinical biochemistry inspection industry, and to establish virtual practical training projects such as nucleic acid detection and liver function detection. Teachers guide students to carry out online training projects with high complexity, high risk and high cost, and flexibly input ideological and political points of "Innovation, biosecurity, fairness and integrity" course. For example, to carry out the cholesterol measurement training project, students use the virtual cholesterol measurement training platform to carry out virtual training on experimental steps, laboratory biosafety matters, experimental data processing and other links (Table 3).

Table 3. Digital technology to realize Medical laboratory technology course ideological and political digitization

| Project Name | Docking Course | Digital Technology | Digital Content Design | Digital Technology Characteristics |
|--|---|---|--|---|
| Virtual simulation system resources for biochemistry test ability Improvement competition | Biochemical test | Virtual simulation | Instrument maintenance, Fault handling, quality control | Immersive, Interactive, Illusory, Realistic |
| Medical laboratory technology vocational qualification examination training system resources | Introduction to medical laboratory techniques | Micro video technology, Distributed database | The six sub-subject sections of the vocational qualification examination | Interactivity, Vividness, Structure, Sharing |
| Hemology technology training system resources | Hematological testing techniques | 3D animation technology, Distributed database | Morphological changes of butt blood cells, Bone marrow cells and Blood system diseases | Verisimilitude, Intuitiveness, Structure, Sharing |

5 Condensed Curriculum Ideological and Political Digital Teaching Methods [10, 11]

Based on the course content and digital teaching resources, the author and his team formed the “four outstanding” teaching method, making the integration of curriculum teaching and ideological and political education more diversified and detailed. One is to adopt a combination of online and offline teaching, record students’ dynamic learning situation with big data, provide personalized guidance for students’ academic growth, and highlight the “information supported curriculum education”. The second is the combination of virtual-real teaching, carrying out digital medical experiments with high cost and high occupational exposure risk, highlighting the “science and technology enabling curriculum education”. Third, role experience teaching, students role to achieve virtual reality to play famous scholars, role models of The Times, real experience of medical spirit, highlighting the “practice to promote curriculum education”. Fourth, digital task-driven teaching, the establishment of “small scientific research and big innovation” digital task project, highlighting the “scientific innovation leading curriculum education”. For example, the virtual simulation software platform of clinical laboratory in primary

hospitals is used to carry out digital practical training, and the simulation medical laboratory personnel carry out the practical training project of glucose oxidase method to determine serum glucose content, so as to play the double role of skill training and curriculum ideological and political digital education.

6 Conclusions

The professional courses of medical laboratory technology have been upgraded by a series of digital technologies, and the educational effect has gradually shown. The course team uses online anonymous teaching evaluation, peer teaching evaluation inside and outside the school, student forum, questionnaire survey and other forms to carry out the implementation effect evaluation of the course. Among them, 95% of the campus counterparts believe that the curriculum team has a solid foundation in digital teaching, especially the digital technology-enabled curriculum ideological and political integration into nature, teaching knowledge and skills and improving professional quality of education effect is obvious. 92% of industry personnel believe that the skills and professional norms imparted by the course meet the job requirements by participating in the teaching links supported by virtual reality digital technology such as hospital internship and practical teaching. Most students believe that the teaching methods of the course are diverse and the content is easy to understand. They prefer the combination of online and offline learning, virtual simulation and training platform learning and other links, which are very useful for the professional norms and professional spirit strengthened by the course.

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