



Research on Informationization Construction of Professional Courses Based on Big Data

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Abstract. In the current rapid development of big data technology in modern teaching, in response to the problems of insufficient informationization construction of professional basic courses and the lack of close integration between big data technology and course construction, this article summarizes the overall situation of professional course construction, analyzes the problems in professional basic course construction, and proposes solutions for course informationization teaching based on big data and future education, This provides certain reference and reference value for the informationization construction of professional courses based on big data in the future.

Keywords: big data; informationization construction; future education; professional basic courses.

1 Introduction

Currently, big data technology is developing rapidly and is widely used in multiple fields. In today's modernized education, the role of big data technology [1-2] in educational and teaching activities is becoming increasingly evident. In response to the demand for information technology [3-4] in future education [5-6], there is an urgent need to carry out research on the construction of information-based teaching. This paper combines the current situation of professional basic courses and, based on big data technology, constructs a paradigm for future education curriculum construction to achieve information-based teaching of professional basic courses and effectively support information-based teaching of professional basic courses in future education.

2 Overall situation of professional course construction

2.1 In Terms of Disciplinary and Professional Construction

Combining the curriculum construction and teaching tasks undertaken, we will gather the strength of the teaching and research department to build a curriculum content system and talent team for undergraduate education. Among them, three newly established courses will be offered in the autumn semester of the third year of college, with tight teaching preparation time and heavy tasks. With the guidance and assistance of the Academic Affairs Office, a combination of old and new, and guidance and technology will be adopted. Experts and professors will coordinate and supervise the entire process, and core young backbone members will focus on researching and creating a curriculum content system, teaching methods and means, and teaching condition construction. It is planned to study in local universities, exchange with enterprises and manufacturers, and conduct research on internship units, Innovatively construct and improve the curriculum content system, teaching methods and means, and teaching conditions. For the new course, the course team has conducted research and construction first. After sufficient discussion and argumentation, relevant construction plans and plans with strong guidance have been formulated, and some materials such as courseware and lesson plans have been sorted and improved. The next step will continue to deepen the course construction, ensuring that the course teaching tasks are completed with high standards next year.

2.2 In Terms of Teaching Content Construction

Based on the adjustment and changes of the college's education professional talent training program, we actively carry out teaching reform of education professional courses, and explore and practice the implementation process of course teaching in response to the opinions and suggestions put forward by experts. Focusing on the training task undertaken for the first time, the teaching and research department closely revolves around the teaching philosophy of "student-centered", and carefully designs the curriculum and teaching content system based on the job requirements and job abilities of students. Under the leadership of the teaching and research department leaders, we conduct research in frontline units and enterprises, hold discussions with experts, and consult online. At the same time, carefully formulate a lesson preparation and trial teaching plan, and carry out collective lesson preparation and trial teaching to ensure quality. At present, the training class has been successfully completed and achieved the expected teaching effect. During the implementation of the training, the Teaching and Research Office organized multiple discussions, exchanges, and questionnaires with the students of the training class, collecting and mastering opinions and suggestions on similar teaching class arrangements and course content settings in the later stage. This undoubtedly laid a certain foundation for us to further improve the teaching content and methods.

2.3 In Terms of Teaching Methods and Means Construction

For the core courses of undergraduate education (integrated training), the teaching team actively applies task-based, exploratory and other methods to carry out immersive teaching, allowing students to discover and solve problems in tasks, acquire new knowledge while completing tasks, improve their ability quality, and lay a foundation for job positions. After three years of continuous construction and with the strong support of the college government, this course has been rated as an excellent course at the college level, a high-quality course at the school level, and a first-class undergraduate course at the provincial level. At present, we are continuing to optimize the course teaching content, innovate teaching methods and means, and build supporting teaching conditions, striving to combine comprehensive improvement and perfection, and create a national level golden course.

2.4 In Terms of Teaching Condition Construction

One is to actively promote the construction of teaching conditions for core courses. Regarding the course teaching and construction tasks undertaken by the teaching and research department, we have conducted a thorough demonstration of the conditions for construction in the early stage, and submitted a demand construction report to the university through the college's education and social security department. At the same time, a supporting teaching condition demonstration and application have been carried out recently, and a report evaluation will be conducted in the college in the near future.

The second is to immediately carry out the construction of simulated teaching conditions. As of now, the first phase of the simulated teaching conditions construction project has been partially delivered, the software has entered the testing preparation stage, and the second phase construction plan has been discussed and completed. After being reviewed and approved by the college office meeting, relevant procurement bidding work will be carried out immediately; The teaching evaluation system has passed the university evaluation and acceptance; The simulation training system is accelerating according to the timeline. The above teaching conditions construction achievements can not only provide decision-making support for undergraduate education (integrated training) majors, but also to a certain extent for relevant institutions to carry out reasonable construction planning.

2.5 In Terms of Teaching Team Building

At present, one teacher in the teaching and research department has not participated in the acceptance of the new teacher's trial lecture. The teaching and research department attaches great importance to this work, establishes a dedicated team, and designates an associate professor to be responsible for carrying out assistance to the new teacher. It plans to participate in the acceptance of the new teacher's trial lecture next spring semester; Young teachers actively participate in the ISW training organized by the

college, and during a short and busy three and a half days, they acquire rich teaching skills and valuable teaching experience.

3 The problems in the construction of information-based classrooms

3.1 The Teaching Methods and Means are Outdated, Not Innovative, and the Application of Big Data and Information Technology is Insufficient

At present, some courses in the teaching and research department still adopt a text-book based teaching method, with only the teacher speaking on stage and no student interaction visible. The use of big data and information technology teaching methods is seriously insufficient, as shown in Figure 1. In addition, some teaching content can be visualized and explained in a visual way, transforming intangible into tangible and complex into simple. However, some teachers try to save time and only talk on their own, leaving students to understand if they don't understand. In response to such issues, the next step is for the teaching and research office and teaching team to continue to increase their efforts in information technology construction. The teaching and research office and teaching team should play a role in inspection and guidance, conduct weekly teaching seminars and trial lectures on teaching research days, and the course leader should effectively propose improvement measures and report on the improvement results in the next research and trial lecture.

3.2 The Course Content is Outdated and the Demand for Enterprises is Unclear

Part of the knowledge still uses relatively outdated data and content. In addition, the understanding of the bottom line of enterprise demand is unclear, and it is unclear what the enterprise is doing and what it needs. The relevant teaching content still reflects on the level of "I think" and "I think". Next, the teaching and research office and teaching team will supervise the course team to update outdated content, conduct timely research to understand the current situation and needs of the enterprise, understand the bottom line, and strictly control the teaching content.

3.3 Lack of Teaching Conditions for Some courses, Inaccurate Demand Reporting, and Inability to Effectively Support Course Teaching

The use of teaching conditions in some courses is not in line with the teaching content, and the construction of conditions is not carried out from the perspective of teaching needs, resulting in some course teaching conditions not being able to meet teaching requirements well. The next step is to conduct in-depth research on the construction of teaching conditions from the beginning, determine the curriculum content system, clarify practical content, accurately report teaching condition requirements, and solve the problem of low compatibility between teaching condition construction

and teaching content. The existing teaching conditions with low utilization rates can be changed to open and expanding teaching, expanding students' knowledge and cultivating their innovative thinking.

3.4 The Mechanism for Building Teaching Teams is Not Yet Perfect, and Curriculum Construction Still Relies on One or Two People, with Unclear Cohesion and Synergy

In course construction, in most cases, each member simply divides tasks according to the course content, and their teaching is still at the level of "fighting alone". In many cases, they still only rely on one or two specific teachers in class, and only achieve front-end integration in the form of the course. The overall structure and knowledge points have not been connected, nor have they formed the overall spiritual core and external style of the course. As for the sharing of experiences and achievements between horizontal and vertical teams, as well as across teams, it is even less common. At the same time, young people participate in multiple course teams and work as odd hands in each team, sometimes making it difficult for them to be proactive. Next, we will effectively leverage the role of the course team, adopt a system of course leader responsibility, formulate construction plans and expected outcomes, refine tasks for each member, conduct regular course construction discussions, address existing problems, and conduct results verification.

3.5 The Ideological and Political Education in the Curriculum is Not Clearly Reflected, with Serious Formalization, and Emotional and Value Education is Not Deep or Thorough

The design of ideological and political education in frontline teaching is not deep enough and vivid enough. Some ideological and political elements in the class are either missing, or there are rigid and forced phenomena in the settings. More ideological and political education is for the sake of ideological and political education, dealing with superior inspections, which appears relatively dull and cannot effectively stimulate students, making them produce ideological resonance and emotional identification. Course ideological and political education should start from the course content itself, naturally integrate ideological and political elements from the inside out, and extend ideological and political perspectives. Ideological and political elements should also be closely integrated with teaching content, transitioning naturally. The next step will be to organize members of the teaching and research department to actively participate in ideological and political design training, and conduct specialized discussions on course ideological and political education to solve the problem of formalization of ideological and political education.

4 Improvement measures for information-based classroom teaching

4.1 Increase Support for Young Teachers to Participate in Research Projects on Big Data and Information Technology Teaching

At present, the probability of success for young teachers applying for research projects on information technology teaching is relatively low. The actual situation is that conducting teaching research can comprehensively and deeply grasp the disciplinary and professional system, and is one of the effective means to deepen curriculum content and innovate methods and means. In addition, effective teaching research can also enhance the teaching ability of teachers. Therefore, it is suggested that the college can establish teaching and research projects for young teachers under the age of 35, and support young teachers in conducting big data and information technology teaching research, such as aggregating relevant data and analyzing it based on density maps, as shown in Figure 1. The density value of the current is represented in Figure 1.

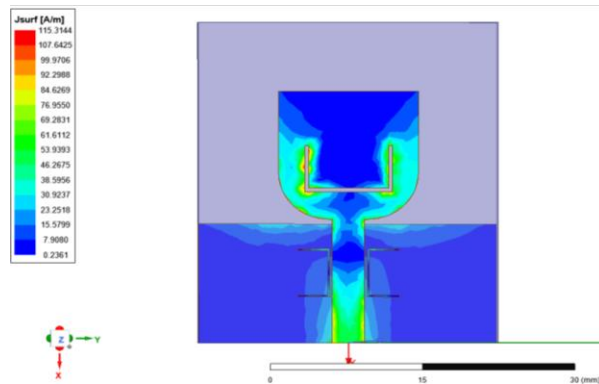


Fig. 1. Data density map.

4.2 Encourage Young Teachers to Introduce the Latest Information Technology into Their Curriculum Teaching

Young teachers have active thinking and strong innovative abilities. Many of them have just graduated from master's degrees and are familiar with the latest research results in their field. The college should encourage young teachers to use big data and information technology, and bring the latest achievements in this area into the classroom, so that students can understand the current situation and development direction of the knowledge they have learned in the big data system, and enhance their learning interest and exploration spirit. The multi-layer structure of data shares similarities with the multi-layer structure of the substrate, as shown in Figure 2. Information technology teaching includes multimedia teaching methods, internet teaching methods, simulation teaching methods, database teaching methods, personalized teaching

methods, intelligent assisted teaching methods, virtual reality teaching methods, mobile learning methods, etc.

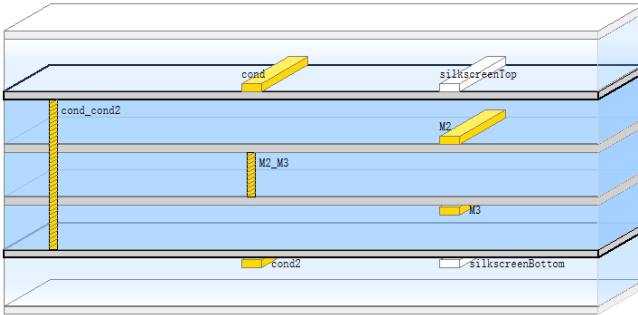


Fig. 2. Data layer structure and substrate multilayer structure.

4.3 Increase the Advanced, Innovative, and Challenging Nature of Course Teaching

For undergraduate courses, add challenging research and design content. According to the different abilities and needs of the teaching objects, it is appropriate to arrange extension content with certain difficulties, such as attempting to analyze and process the data to obtain relevant results, as shown in Figure 3. In Figure 3, V_{in} and V_{out} represent the input and output voltages, and the curves in the figure represent the results of voltage processing. When formulating assessment plans, students who dare to innovate and have innovative ideas will be given extra points and encouragement. At the same time, for seminar case analysis courses, avoid a question and answer style (with fixed answers) discussion question setting, and try to combine reality to focus on key, difficult, and hot issues to make the discussion more closely related to the position; Materials should be sent to students and questions should be assigned in advance to improve the effectiveness and efficiency of classroom discussions; Teachers themselves should have targeted plans for the questions that students may raise, and should not step on watermelon peels and slide wherever they go.

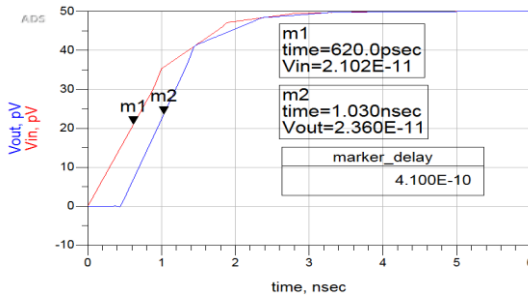


Fig. 3. Data analysis and processing.

4.4 Fully Leverage the Role of Course Teams and Teaching Research Days

Suggest expanding the content and forms of research in teaching research days. For example, new knowledge training can be carried out, professional cutting-edge hot topics can be explored, teaching methods and models can be learned, information technology teaching methods can be visited, and course teams can discuss the difficulties and problems of course construction; Let new and young teachers play the main role more often. Provide young people with more opportunities to speak up and showcase their strengths in addition to the new course trials. In the past, during the trial teaching process, it was mainly old teachers who provided suggestions and opinions to new teachers, allowing young people to also give more "lessons" to old teachers. Now, a large number of newly recruited doctoral and master's students have a complete knowledge structure system, high information literacy, and relatively new knowledge. They can be introduced to new information technology teaching methods, new teaching concepts, and other aspects of learning, referring to the Youth Teacher Club to incubate and cultivate new teachers; The combination of teaching research days and course team building allows the course team to carry out team building activities through teaching research days. Through this platform, different teaching teams can also share experiences and achievements horizontally and vertically, as well as across teams, to achieve the integration of data exchange and lay the foundation for information-based teaching, as shown in Figure 4.

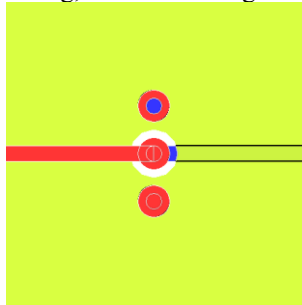


Fig. 4. Horizontal and vertical data exchange and fusion.

5 Conclusions

This paper combines the construction of professional basic courses and analyzes the current situation of professional course construction based on big data technology, including five aspects: subject specialization, teaching content, teaching methods and means, teaching conditions, and teaching team building. It discusses the problems in the current construction of professional basic courses and proposes solutions for information-based teaching of courses, This provides certain reference and reference value for the informationization construction of professional courses based on big data in the future.

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