Research on data specification and the construction of computer-aided innovation and entrepreneurship education curriculum system

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Abstract: in the process of the transformation from information technology to big data era, in order to strengthen the course teaching of students, improve the students' ability of mathematics application and innovation and entrepreneurship, optimize and upgrade the curriculum structure of information and computing science, so that the curriculum system as a whole forms an innovative and entrepreneurial course group which is connected and unified with each other. And the reform and practice of classroom teaching mode, extracurricular practice teaching, assessment methods and methods are carried out.

1. Overview

Big date is another great leap forward of information technology after cloud computing and Internet, which will cause profound changes in economy, industry, technology, security, education and other fields [1-4]. At the digital Expo held in Guiyang on May 26, 2016, Ma Xueli, British ambassador and counsellor to China, said: big data is an attractive "diamond mine". How to mine and make good use of this mine has become a hot topic for discussion among major enterprises.

Generally speaking, big data mainly refers to the huge amount of data information, and its "huge" degree is that it can not be acquired, analyzed and managed manually in a limited time, and extracted from it as reliable information that can be used by people. Big data generally shows four characteristics [3, 4]: (1) large amount of data information; (2) various types of data, including not only common text, but also pictures, videos, audio and their mixtures; (3) fast data processing, high timeliness, which requires quick access to valuable information from various types of data and can give valuable decisions Policy; (4) low value density.

The arrival of big data era not only provides new opportunities and platforms for modern and contemporary college students to "innovate and start a business", but also puts forward new goals and requirements for the adjustment and optimization and upgrading of the curriculum group of information and Computing Science in Contemporary Colleges and universities. It will lead the development of higher education from quantification to individuation, and will put forward higher requirements for the innovation and change of teaching methods and methods of higher education at this stage.

In fact, in 1998, the Ministry of education adjusted the number and name of mathematics majors. The existing information and computing science majors are mainly composed of four majors: Computational Mathematics, information science, operational research and cybernetics. They always adhere to the guiding ideology of "strong foundation, wide caliber, practical emphasis, and emphasis on education" [5]. Under the guidance of this school running ideology, the curriculum system of information and computing science has weakened the teaching of mathematics basic theory compared with other mathematics majors, and strengthened the teaching of practical mathematics skills for students. For example, on the basis of setting up professional basic courses, the major has also set up relevant optional courses and restricted courses. However, according to the general plan of "innovation and entrepreneurship" education and teaching reform recently made by the Ministry of education, under the background of big data era, cultivating a group of compound talents who are proficient in big data collection, storage, management, mining, analysis, processing and application is the new goal of the future development of the major. To comprehensively

improve the innovation and entrepreneurship awareness and innovation and entrepreneurship ability of college students is to The main line of curriculum system of this major. However, at present, the training system and program of information and computing science professionals in most colleges and universities in China can not support the needs of training big data talents, and it is impossible to provide high-quality curriculum structure, teaching content and experimental training platform for training talents with independent innovation and entrepreneurship.

At present, the integration of mathematics curriculum system and the reform of teaching content based on the background of big data are relatively few in China. The famous ones include the master's major in big data technology and application, which was first opened in 2012 by Beijing University of Aeronautics and Astronautics, and the curriculum design. Chongqing University of Posts and telecommunications has carried out the reform of the curriculum and teaching content of mathematics and Computing Science in Universities in China. Big data and Professor Zhou Tao, an authoritative expert in complex network, conducts research on the application and effectiveness of education big data in student training, management and service for the team [6]. In the past ten years, Baoji University of Arts and Sciences has trained a large number of Applied Talents in Information Computing for the society. However, in the era of big data, there are still some problems between the construction of curriculum group, the revision of talent training mode, the reform of teaching content and methods and the new demand of the society for talents, which need to be optimized, integrated and reformed Practice. Therefore, the research and practice of the overall optimization of information and computing science curriculum system and the reform of teaching content based on big data is an educational and teaching subject that is expected to be studied.

2. Innovative and entrepreneurial information and new talent training objectives of Computing Science

The major of information and computing science is based on mathematics, with numerical calculation, algorithm design and big data processing as the three cores, taking into account the characteristics of science major, while reflecting the cultivation of students' innovation and entrepreneurship ability, forming the professional characteristics of the integration of mathematics, information computing and big data processing. The specific performance is: using mathematical tools to build basic courses for the major of information and computing science Platform: strengthen the teaching method of combining students' mathematics basic course with professional practice and practical training, lay a good foundation for students' innovation and entrepreneurship, pay attention to the cultivation of students' practical skills, pay attention to the study of students' numerical calculation, data processing, analysis and algorithm design, so that students have good quality in big data analysis, information processing, software development, utilization and maintenance, etc To promote students to form the awareness of innovation and entrepreneurship.

This major aims to cultivate students with good political and mathematical literacy, scientific mathematical thinking, perfect mathematical knowledge structure, solid theoretical knowledge of information and computing science, initial training of innovation and entrepreneurship, skilled use of computers for numerical calculation, big data analysis and processing, algorithm design and software development and application. We will train students to be innovative talents engaged in research, teaching, application development and management in science and technology, education and economic sectors.

3. Innovative and entrepreneurial information and new talent training model of Computing Science

At present, the training mode of information and computing science major in our country is mainly the training of application-oriented talents, which is mainly reflected in the curriculum structure and content design, practical teaching methods and other aspects. However, from the actual teaching situation, there is no mutual combination between professional teaching and

practical teaching, and even the professional teaching is divorced from the requirements of the society for talent quality. Therefore, the major of information and Computing Science in Colleges and universities needs to strengthen students' practical teaching activities, actively and effectively cultivate students' ability of numerical calculation, algorithm design and big data processing and analysis. As an important part of cultivating students' ability of innovation and entrepreneurship in Colleges and universities, to make good use of this teaching link, we need to increase the teaching amount of practical training, which can not be ignored for any reason He replaced classroom teaching. Therefore, the author believes that the new teaching mode of information and computing science can be defined as the "five in one" training mode of "professional basic course teaching + professional course simulation practice + professional course social practice + professional innovation ability practice + professional talents entrepreneurship practice".

4. Innovation and entrepreneurship oriented information and optimization of computing science curriculum group

Curriculum group is a curriculum system composed of some similar or related courses with reasonable structure, clear level, mutual connection, cooperation and support [7, 8]. In the content arrangement of a single course, it often forms its own unique content system, and solidifies the number of hours and semesters it teaches in advance according to the course training objectives. In the actual teaching, it is found that there are some single course content and the content of the explained course group can not be effectively connected, resulting in students' poor understanding of the course content in the learning process. In order to solve the effective connection of curriculum content in the curriculum group, and make the curriculum group effectively serve the talent training goal of information and computing science, it is necessary to optimize, upgrade and restructure the curriculum of information and computing science.

One Facing the era of big data, combining with the current situation of information and computing science courses in Baoji University of Arts and Sciences, we should optimize and integrate the existing courses, cancel the setting of individual basic courses or reduce their theoretical teaching, increase some elective courses or professional practice courses related to big data processing, analysis and innovation and entrepreneurship, select high-quality teaching materials and try to select some content compilation Reasonable arrangement, scientific calculation, algorithmic language design, big data processing and analysis, and the cultivation of students' innovative and entrepreneurial integration of excellent teaching materials. At the same time, it can increase practical training and practical course teaching, for example, it can increase the foundation of computer information technology, the course of data statistics and analysis, weaken or delete analytic geometry. In addition, some elective courses and practical application courses, such as cloud computing, big data analysis, big data network, data visualization, data mining and so on, should be added appropriately. In the course of reasonable setting and optimization integration of courses, combined with teaching practice, some of the more sophisticated and profound basic theories set up in some courses can be briefly described, focusing on or adding application and practice knowledge, and strengthening the training of students' application computing ability, big data processing and analysis awareness and innovation and entrepreneurship thinking.

Adjust the order of the courses, so that the courses in each semester can be effectively linked and progressed from the aspects of curriculum system, difficulty, knowledge structure, etc. For example, it is advisable to reduce the teaching hours of the core courses of mathematics and information and Computing Science in 2013, such as: mathematics analysis, advanced algebra, analytic geometry, probability theory and mathematical statistics, from 5 class hours / week to 3 class hours / week, and at the same time, properly screen and explain the contents of the courses, focusing on the concept , methods, not to mention or not to mention complicated theoretical proof. MATLAB and its application, C + + programming and other courses should be set up as early as possible, so as to facilitate the use of them to solve practical problems in the follow-up study. Because of the design of matrix calculation in these courses, this course can generally be arranged after the higher algebra

course. In this way, it not only avoids the disadvantages of poor connection of knowledge in teaching, but also lays a foundation for strengthening students' experimental course learning.

5. Reform and practice of teaching mode, practical teaching and assessment method

5.1 Teaching mode

In the whole professional course teaching, we always adhere to the "three promoting one" gradual teaching mode of theory promoting practice, practice promoting innovation and innovation promoting entrepreneurship. In terms of teaching methods, we should pay attention to guiding students' hands-on practice and the ability of using data to make decisions on problems, desalinate the profound basic mathematical theory in some courses or reduce some mathematical theory teaching, especially the complex mathematical reasoning and demonstration, strengthen the teaching of students' mathematical practice and innovative thinking, and constantly build a platform for students' entrepreneurship.

5.2 Practical teaching

Under the background of big data, the proportion of practical teaching is far greater than that of theoretical teaching. Practical teaching should focus on the cultivation of students' practical ability, and build a "three-dimensional" practical teaching platform based on curriculum basic laboratory, professional training laboratory and open laboratory. At present, the practical teaching investment of information and Computing Science in Colleges and universities is insufficient. Therefore, on the basis of the existing experimental conditions, it is necessary to increase the construction of curriculum basic laboratory, professional training laboratory and open laboratory. At the same time, we should strengthen the cooperation between the school and the enterprise, establish the experimental and practical teaching base outside the school, cultivate the students' practical ability, and lay a solid foundation for their innovation and entrepreneurship. At present, on the basis of the existing mathematical modeling laboratory, our university has established a big data processing and analysis laboratory. At the same time, we have established a stable framework agreement with Xi'an outsourcing college, Xi'an Dingli science and Technology Co., Ltd. and other companies to jointly train students. Students have 1-2 weeks of off campus training each term to apply their theoretical knowledge. After the training, they return to the university to continue their courses Cheng studies to solve the theoretical problems in practical training. After such several rounds of study and probation, the comprehensive ability of students has been greatly improved.

5.3 Assessment method

In terms of assessment methods, we should reform the existing course assessment system, which integrates final examination, usual assessment and homework performance. Emphasis should be placed on the assessment of students' ability, and the assessment method of practical teaching from multiple perspectives and all aspects. As an important means of teaching effect evaluation, assessment method plays an important role in guiding students and teachers. Therefore, the assessment method with ability as the core should not be based on the degree of knowledge mastery or the amount of knowledge acquisition, but on students' learning ability, practical ability and innovation ability. Therefore, teachers' evaluation, students' self-evaluation, experimental training base and other multi-level evaluation methods should be established to strengthen the weight of experimental training evaluation indicators. At the same time, the full tracking evaluation of the training process should be carried out, and the whole process evaluation should be carried out from the requirements of course theory learning, practical teaching preparation, specific experimental training process, practical skills competition and other aspects.

6. Conclusion

Under the background of big data era, data is an important strategic resource of a country. Collecting data, processing and using data, and predicting the law of things' development from the

data is a big challenge for China's talent demand in the future. Big data has opened a major transformation of education era, and also provided new opportunities for the cultivation of students' innovation and entrepreneurship ability [10]. This paper optimizes and upgrades the curriculum structure of information and computing science, and tries to reform the classroom teaching mode, extracurricular practice teaching and examination mode. From the reality of the students majoring in information and Computing Science in our university, our reform of the curriculum system of information and computing science has achieved some satisfactory results in personnel training, but there are still many problems to be solved and perfected in practice.

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