Research and Design of the Curriculum System of Information Management and Information System Major

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Abstract. The design ideas of reverse design and forward implementation are adopted, and the professional curriculum system of information management and information system (hereinafter referred to as information management) is researched and designed with the concept of engineering education certification. Different from the conventional thinking of the course system design of the information management major, this paper combines the disciplinary background advantages of the School of Software, and systematically decomposes the professional knowledge, ability and quality, etc. The curriculum system of training objectives adopts the U/C matrix method to solve and design the group progress of the curriculum. The research conclusions provide a certain reference for the reform of information management and personnel training.

Keywords: Information management · course system · course group · engineering education certification

1 Introduction

The information management major trains compound talents with knowledge of management, economics and information technology, mastering the methods and technologies of analysis, design, implementation and management of information systems, and a certain ability to comprehensively utilize information systems and information resources [1]. Before the 1990s, the major of information management mainly concentrated in the fields of library management and information science, and then gradually migrated to the fields of computer and economic management [2]. With the development of society and economy, the relevant curriculum settings are gradually unable to meet the actual needs of units and enterprises. Although colleges and universities will formulate talent training programs with their own characteristics based on their own advantageous disciplines and market research, they only start from The curriculum system is established from the perspective of disciplines, and its curriculum system construction still continues the guiding ideology based on economics and management, library and information science as the core, and information technology as the means.

On the other hand, there is a certain disconnect between the traditional information management curriculum system and social and economic development; on the other hand, with the rise of new disciplines such as big data management and application, the living space of traditional information management majors is further squeezed. Therefore, it is urgent to reform the existing curriculum system of information management.

2   Research Ideas

In 2016, China successfully joined the Washington Accord and became the 18th signatory member of the agreement [3]. Engineering education certification is a process of evaluating, certifying and proposing improvement measures for the quality of college education [4]. Through engineering certification, industry experts or educational peers can accurately and efficiently identify the problems existing in the current professional talent training, provide effective measures and suggestions for improving the quality of education, and further determine the goals of talent training. Finally, construct a sustainable cooperative ecology for engineering education [5].

The core ideas of educational professional certification include outcome orientation, student-centered and continuous improvement [6–8]. The reform of engineering education in local undergraduate colleges and universities is to take the achievement of engineering education professional certification standards as the benchmark, reform the traditional engineering education model, cultivate high-quality applied engineering and technical talents for the industry, and provide talent support for the development of local industries [9]. The idea of Outcome-Oriented Education (OBE) can be used to plan the educational reform of information management major. The implementation process of OBE is shown in Fig. 1.

In the process of implementing the professional reform of the Information Management Major of Guangzhou Software Institute, first of all, according to the orientation of professional personnel training and the discipline advantages of the college, the knowledge, ability and quality have been systematically analyzed and designed to form a curriculum system consistent with the training objectives. Secondly, implement a series of teaching reform measures (such as the reform of engineering education model based on CDIO) according to the curriculum system that matches the expected training objectives; finally, establish a closed-loop feedback teaching quality assurance mechanism, and adopt multi-dimensional evaluation methods to evaluate students' learning effect. Conduct assessments and feedback. The overall idea of the specific reform is shown in Fig. 2.

Adopting the general idea of reverse design and forward implementation, the professional training objectives are determined according to the needs of industry talents

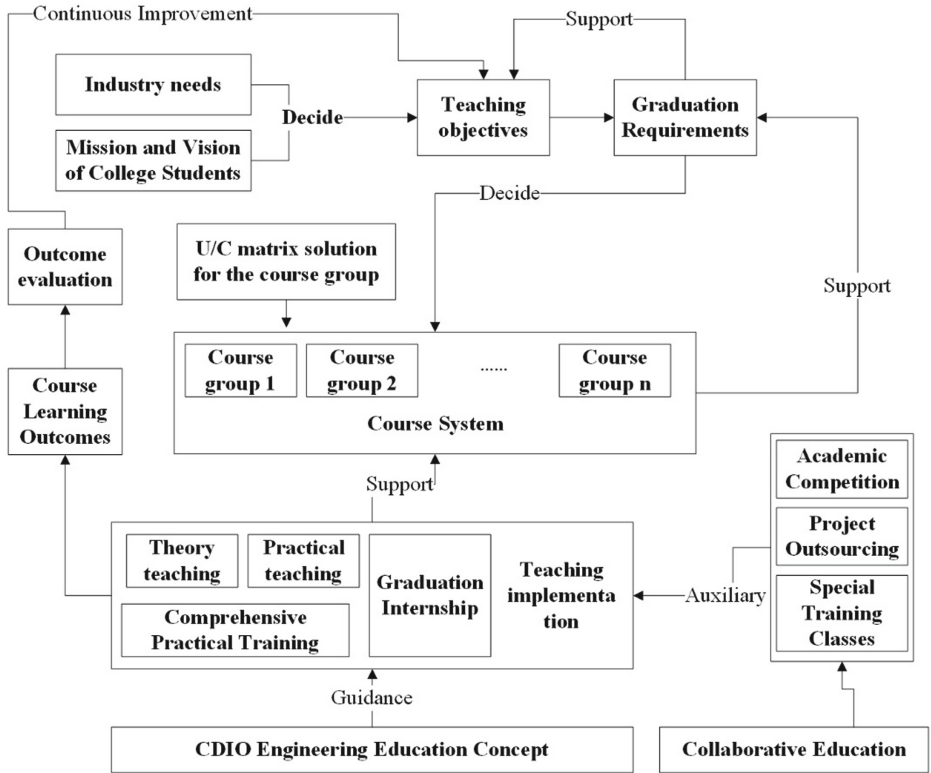**Fig. 1.** Implementation process [Original]

Fig. 2. Idea of the specific reform [Original]

and the mission and vision of Chinese college students, and the training objectives of this major are determined as follows: familiar with information and engineering-related technologies; The ability of management and business data analysis; applied undergraduate talents who can engage in information system projects and information resource management in enterprises and institutions. This training goal not only meets the national standard requirements for the setting of national undergraduate majors, but also combines the IT advantages and characteristics of Guangzhou Software Institute.

3 Curriculum System Design

3.1 General Idea

The reform idea of talent training needs to be reflected through the curriculum system and curriculum setting [11]. By realizing the matrix to associate the training objectives with the curriculum, the education and teaching reform has been proved to be effective [12]. It is a good method to implement the education and teaching reform. We design the three dimensions of training goals, implementation methods and learning output in a spatial coordinate system. Set the x-axis as the training standard and the z-axis as

the implementation method, then the (x, y) coordinates can form a two-dimensional plane, which represents the design space of the talent training program, which will carry out the training standards and teaching implementation. Associated. If the y-axis is the learning output, it constitutes a three-dimensional space. The construction of the design space is achieved by formulating a talent training plan, and the implementation of the professional training plan is to pursue the maximum learning output in the practical space. Through in-depth research on training standards, a two-level training standard index system is established. The first-level indicators are realized by the curriculum group; the second-level indicators are realized by the professional core courses.

3.2 Curriculum Structure

Discipline is the result of human cognition of nature, and it carries a lot of indirect experience and summary. The discipline has the characteristics of clear logic and complete system [13], but if the subject knowledge is regarded as the whole of the course teaching, it will lead to emphasis on theory and less on practice., the result of emphasizing knowledge over ability. The cultivation of applied undergraduate talents is the training goal of this major, and it is impossible and feasible to use the traditional method to construct the curriculum system. Therefore, I restructured the curriculum system with the concept of engineering education professional certification. The professional curriculum system consists of three teaching platforms, namely the basic knowledge platform, the professional ability platform and the practice innovation platform. The professional curriculum system consists of three teaching platforms, namely the basic knowledge platform, the professional ability platform and the practice innovation platform.

3.3 Course Group Design

The work of curriculum group design is to re-plan and integrate the knowledge, ability, quality and other aspects of the corresponding professional training plan with logical connections, so that they can be related and form an organic combination, form the overall teaching requirements, and make the curriculum teaching systematic. nature, relevance and wholeness [14]. Fragmented courses can be optimized and combined to overcome the defects of developing and designing courses based on disciplinary concepts, establish internal connections between courses, and form a three-dimensional and rigorous course "mechanism", so as to break through the realistic dilemma of course fragmentation and hodgepodge.

   Through research and analysis, the professional positions of information management and their knowledge/ability requirements are obtained, and the courses set are regarded as functional modules with a relatively independent knowledge system in the training program system. These courses need to input the knowledge of other prerequisite courses as the basis, and output new knowledge on this basis. These course modules, which are both interrelated and have relatively independent functions, are integrated into a system with the goal of cultivating students' core professional abilities. From the point of view of the system engineering award, the supply and demand relationship of knowledge between courses can be modeled by the "function-data" approach, taking the course as a function and the data as the course goal. The U/C matrix can be used to express the

degree of correlation between system functions and data. The matrix reflects the sharing degree of data sharing requirements between organizations. At the same time, the matrix also reflects the relationship between data classes [15]. The matrix building process is completed in three steps:

Construction of U/C Matrix. The requirements for relevant knowledge and abilities of professional positions are regarded as data in the columns of the matrix table, and courses are regarded as functions in the rows of the matrix table. C means that the course outputs a certain knowledge, and U means that the course will use knowledge class.

Validity Test of U/C Matrix. For specific data items, there must be a Creator (C) and a User (U). Consistency check: A data item must have one and only one Creator (C). Considering that in the actual teaching process, there may be more than two courses that teach a knowledge from different angles, such as: C programming Basic and JAVA computer programming courses provide the teaching of programming knowledge. Therefore, it is possible to allow a data to have more than 2 C. Next, a redundancy check is performed, and empty rows and columns will not be accepted. That is, each knowledge has a course provided, and no knowledge has at least one course used. The reasons for the occurrence of empty rows or columns should be re-investigated and analyzed in combination with the actual talent training plan, and can be removed from the matrix table after confirmation.

Solving of U/C Matrix. The solution of the U/C matrix is completed by the assignment on the table, adjusting the data rows so that the C in the matrix is closest to the main diagonal. On the basis of not destroying the sequential logical relationship of the knowledge objectives, the column grouping can also be adjusted appropriately so that the U is also as close as possible to the main diagonal of the table. Draw the box corresponding to the course cluster, the box class C corresponding to the course that is designed as a course cluster. The U outside the course box linked to the relevant course modules can indicate the sequential relationship between the courses, providing the basis for the course arrangement semester in the talent training program. The course clusters of the Information Management major are finally designed into four course clusters: professional foundation course cluster, development technology course cluster, business analysis and design course cluster and data analysis course cluster.

4   Conclusion

The talent training model of engineering educator certification is likely to evolve into the formalism of "pipeline education" if it is scripted, which will make the whole process of teaching and educating people lose its vitality and vitality, and lose the basic principle of student-oriented teaching. Therefore, engineering certification needs to be carried out based on the professional characteristics and the actual situation of talent training. According to the concept of engineering education professional certification, the professional training objectives are determined. Combined with the professional graduation requirements and index points, the professional curriculum system and curriculum group are analyzed. With design. The program was put into practice for the 2020 and 2021 undergraduates, and it was found that the curriculum system has a good promotion and improvement for the mastery of students' professional knowledge, the formation

of professional ability, and the development of professional quality. Since there are no graduates cultivated under this curriculum system, it is necessary to carry out professional internships and school-enterprise collaborative education for the new curriculum system. While completing the last mile on the long journey of talent training, further professional training is required. The effectiveness of the reform of the curriculum system is verified and improved.

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