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Exploration of the Construction of an Applied Compound Talent Cultivation System for the Computer Science and Technology Major Based on the OBE Concept: Take Guangxi Science & Technology Normal University as an example

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Abstract: With the rapid development of science and technology, talents emerge in all walks of life. Digital information technology has been widely applied, and the teaching concepts and methods in new fields of computer science have received attention and development. The talent training programs for computer professionals are continuously revised and improved. The undergraduate computer science major in colleges and universities is developing towards the direction of cultivating applied senior talents, fully embodying the educational characteristics of the institution. By introducing the OBE educational concept, the ability to cultivate talents is continuously enhanced. This paper analyzes the current state of computer talent training and the exploration of cultivating applied senior talents using the OBE educational concept. By continuously improving the curriculum system, teaching methods, quality assurance, and the construction of the teaching team through talent training reform, effective talent cultivation measures and strategies are formulated. Only in this way can qualified talents suitable for the needs of contemporary society be cultivated.

Keywords: OBE education concept; Professional talents; Talent cultivation

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1. Background

1.1. Purpose and significance of OBE talent training

The major of Computer Science and Technology (referred to as the "Calculation major") is based in Guizhong, serving Guangxi, facing the grassroots, implementing the Party's educational policy, implementing the fundamental task of cultivating morality and cultivating people, and cultivating good ideological and moral quality and solid basic knowledge of mathematics and natural science according to the requirements of the school's talent training program. Basic theories, basic knowledge, and basic skills related to computer

systems and network space security, strong engineering practice ability, good innovation spirit, teamwork and communication ability, self-development ability, all-round development of morality, intelligence, physical and labor, ability to adapt to the needs of social and local economic development, skilled use of professional knowledge and skills of the program, high-quality computer engineering professional talents.

The talent training program is to meet the needs of the current social and economic development and to serve the social and economic construction. It is imperative to do a good job in the training of current engineering professionals. In the 14th Five-Year Plan for National Economic and Social Development of the People's Republic of China and the Outline of 2035 Vision Goals, the fifth chapter emphasizes "accelerating digital development and building a digital China," embracing the digital era, activating the potential of data factors, promoting the construction of a strong network country, and accelerating the construction of a digital economy, a digital society and a digital government. Computer professionals are needed to drive the transformation of production mode, lifestyle and governance mode through digital transformation as a whole [1]. With the popularization of emerging digital industries such as smart cities, smart cities, 5G intelligence, Internet of Things for automobile enterprises and artificial intelligence, big data, blockchain, cloud computing, network security and smart agriculture, it is urgent to accelerate the revision of computer talent training programs. In 2018, the Ministry of Education issued the "National Standards for Undergraduate Professional Teaching Quality in Colleges and Universities" (hereinafter referred to as the bidding), which highlights the student-centered education concept, the "output-oriented" education system, and the quality concept of "continuous improvement" [2]. According to the requirements of the National Standard, as a base for training computer talents, colleges and universities should meet the needs of local economic development. This paper is based on the Outcomes Based Education (OBE, education model based on learning output) talent training program, for society to cultivate compound, applied advanced computer professionals laid the foundation.

1.2. Current situation of OBE computer talent training

OBE is an educational concept oriented to student learning outcomes, emphasizing that the ultimate goal of education is to train students to have certain abilities and qualities. Results-oriented education is an educational philosophy that emphasizes that education should be oriented towards the expected learning outcomes, rather than focusing solely on the teaching process or input.

1.2.1. Status quo of OBE abroad

OBE education model originated from North American countries, which means a teaching model that "ensures that students carry out learning activities around the training goals so that students can obtain substantial learning results when they graduate" [3]. As a learning results-oriented reverse dynamic thinking concept, the OBE concept has been fully developed in North America and Europe, and combined with the national conditions of each country to form their systematic education and teaching system [4]. OBE education concept has been widely used in the training of accounting professionals. Universities in Western countries, Europe, America, Japan, India, South Korea and Taiwan have implemented the OBE model in the course setting, teaching methods and evaluation system of computer majors. The education system of these countries (regions) is more mature, and the training of computer professionals has strong practical ability and innovation ability. At the same time, they also exert importance on the cultivation of students' interdisciplinary learning, teamwork and communication skills.

1.2.2. Domestic status of OBE

Domestic research on OBE began in 2003, and 2012, OBE began to enter the field of view of domestic educators in a real sense [5]. There are some deficiencies in curriculum setting, teaching methods and evaluation systems in the training of computer professionals in domestic colleges and universities. In order to solve the above deficiencies, domestic colleges and universities began to learn from foreign advanced OBE education concepts, combined with their actual conditions, and constantly improve the computer personnel training system. In recent years, domestic colleges and universities have paid attention to students' learning results, tried to reform the curriculum system, teaching methods and evaluation system, and also tried to introduce the OBE education concept in the training of computer talents, focusing on practical teaching, project-driven, team cooperation, and other aspects to improve students' practical and innovative ability.

1.3. OBE education concept

After the OBE education model was proposed by Spay *et al.* in the 1980s, it emerged in the United States, Britain, Canada and other Western countries. OBE is an educational concept based on students' learning output, which emphasizes the pre-setting of learning outcomes and the regular evaluation of the achievement of outcomes, and the evaluation results are used for continuous improvement [6]. In the OBE model, what students learn and whether they succeed is far more important than how and when they learn. Educational structures and curricula are seen as means rather than ends. If they fail to contribute to the development of students' specific abilities, they are to be rebuilt. In this sense, the OBE education model can be regarded as an innovation of the education paradigm. OBE is an educational process that focuses on students' learning output [7].

2. There are shortcomings in traditional computer talent training

Local colleges and universities are the cradle of personnel training. They rely on the needs of local economic development to train talents that meet the needs of local economic development. China's higher education is in an important stage of reform, and there are still shortcomings in all aspects of development.

2.1. The mode of personnel training is out of line with society

Through investigation and research, it is found that some local colleges and universities learn from the training programs of research-oriented talents and core courses set by 985 or 211 colleges and universities, which deviates from the training goals of application-oriented talents and the original intention of talents training of local undergraduate colleges and universities. The learning ability of most students in local colleges and universities cannot meet the learning ability of students in key universities, and the graduation of students cannot meet the requirements of graduation from key universities. If the research-oriented talent training programs were relied on and the core courses set up by key universities, students would fail to meet the graduation requirements of their majors, and the talent training programs would be useless.

2.2. Unclear professional positioning

Accounting has a wide range of majors without a clear and unified goal direction. In some places, it overlaps with software engineering, big data and artificial intelligence. The goal of talent training is single, the orientation of talent training is unclear, the setting of majors is seriously disconnected from society and enterprises, and the setting of the curriculum system does not meet the needs of social development, resulting in unemployment after

graduation.

2.3. Teachers cannot meet the needs of talent training in the new form

The single source of teachers, the uneven teaching team, the unreasonable structure of the teaching team, and the low educational level of teachers have seriously hindered the training of talents. Most of the newly graduated young teachers are directly pushed to the front line of teaching without teaching practical experience. Some non-teachers are engaged in professional teaching work.

2.4. Lack of innovation in school-running philosophy

Through investigation and investigation, it is found that most of the talent training programs, curriculum settings and evaluation systems of colleges and universities with accounting majors are similar. Guangxi Science & Technology Normal University, as a local university, should serve the local regional economic development. According to the needs of local economic development and its development, it offers its specialized courses with characteristics, cultivates different applied talents, and constantly innovates in characteristic specialties to cultivate various talents that meet the needs of local economic development.

3. Exploration and analysis of OBE personnel training reform

With the popularization of higher education in the country, local colleges and universities have gradually become the main forces of undergraduate level education in higher education, and applied undergraduate talents have become the main talent cultivation levels in local colleges and universities [8]. The talent training of Guangxi Science & Technology Normal University promotes the economic development of Guangxi region and cultivates specialized applied senior talents for regional development. Just as Pan Maoyuan said: "As the main position of cultivating application-oriented talents, application-oriented undergraduate colleges should be different from the academic talents cultivated by traditional undergraduate colleges and from the technical talents cultivated by higher vocational colleges. Application-oriented universities cultivate application-oriented talents suitable for social needs, whose knowledge, ability and quality structure have distinct characteristics, solid theoretical foundation, wide range of professional knowledge, strong practical ability, high comprehensive quality, and strong ability of science and technology application, promotion and conversion" [9].

3.1. Competency-oriented curriculum system setting

Under the concept of OBE education, the curriculum system of computer majors should be closely combined with social needs, the curriculum system should be matched with the job requirements, the curriculum system should conform to the course teaching content and meet the graduation requirements. The curriculum system consists of three parts: general education, professional education, quality development and innovation and entrepreneurship (**Figure 1**) [10]. The curriculum system focuses on cultivating students' practical ability, innovation ability and comprehensive quality.

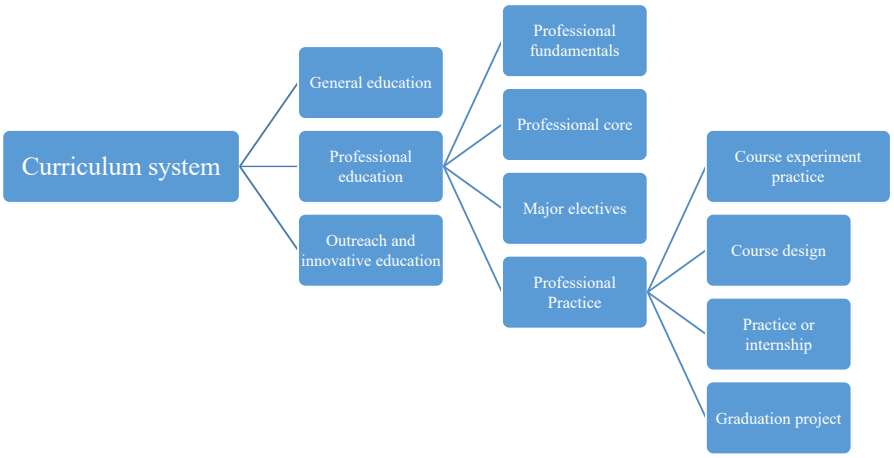

Figure 1. Curriculum system.

3.2. Student-centered teaching method

The OBE education philosophy emphasizes student-centered, that is, student-centered development, student-centered learning, and student-centered learning outcomes. OBE exerts great importance on the transformation from subject orientation to goal orientation, from teacher center to student center and from quality control to continuous improvement [11–13]. Therefore, the teaching methods and methods of computer science should be reformed accordingly. Teachers should pay attention to students' individual differences, use cases, projects, discussions and other teaching methods to stimulate students' interest in learning and cultivate students' initiative and independent learning ability.

3.3. Continuous improvement of teaching quality assurance

OBE educational philosophy requires educators to continuously optimize teaching methods and strategies based on student learning outcomes. Computer majors should establish a perfect teaching quality evaluation system, and regularly supervise and evaluate the teaching process to ensure the continuous improvement of teaching quality.

3.4. Practical teaching integrating production and teaching

The computer major should strengthen the cooperation with enterprises and carry out the practical teaching of the integration of industry and education. Through the joint establishment of projects with enterprises, practical training and other ways, with the help of the internship base of enterprises, students can exercise their professional skills in the actual working environment, and improve the competitiveness of employment.

3.5. Construction of teaching staff

Computer majors should strengthen the construction of teachers, and improve teachers' professional ability and teaching level. Teachers should have industry background and practical experience, and be able to provide students with practical teaching content and guidance. To sum up, the reform and exploration of OBE computer professional talent training need to be comprehensively reformed from the aspects of curriculum setting, teaching methods, teaching quality assurance, practical teaching and teacher team construction to improve the quality of talent training and meet the social demand for applied computer professional talents.

4. OBE personnel training measures and countermeasures

4.1. Define the training direction of accounting professionals

In the preparation of a student-centered talent training program, questionnaires and interviews should be conducted according to social development and local economic needs, and the talent training program should be adjusted according to the research results (**Figure 2**).

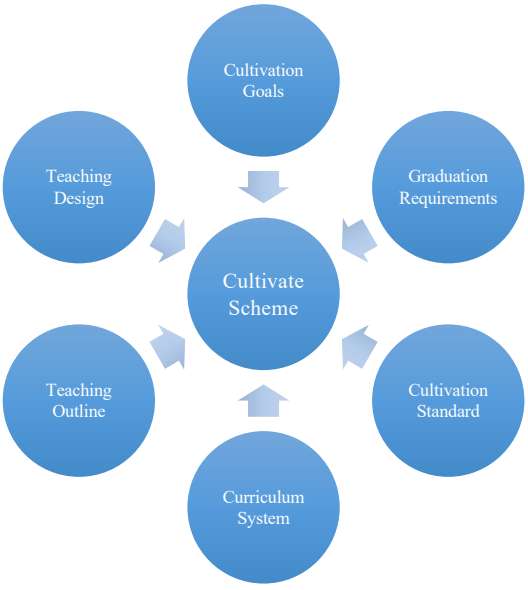

Figure 2. OBE talent training program.

For the training program, it is necessary to clarify the relationship between training objectives and graduation requirements, the relationship between graduation requirements and teaching links or curriculum system, and the relationship between graduation requirements and course teaching content, which are interdependent and interactive.

4.2. Strengthen the construction of teachers

The success or failure of the development of colleges and universities mainly depends on the construction of teachers. A good university must have first-class and high-quality teachers. At present, there are 98 teaching and administrative staff, including 75 full-time teachers and 5 laboratory personnel. Among the full-time teachers, there are 8 professors, 23 associate professors, 3 teachers with doctorate and 83.33% teachers with master's degrees or above. They are a teaching team with reasonable structure of age, academic background and professional title.

4.3. Attach importance to practical teaching

Attaching importance to practical practice teaching is an important approach and a key link for higher education to cultivate applied talents. It is the only way for students to serve society from school, and constantly improve their comprehensive quality and professional skills through practical practice.

4.4. Adjust the teaching mode and innovate the existing teaching methods

Based on the OBE teaching concept, the traditional teacher-centered teaching model is transformed into a

student-centered teaching concept. The teaching methods suitable for the OBE concept include mixed teaching mode, task-driven teaching, case teaching, inquiry teaching, BOPPPS teaching, etc. Among them, the BOPPPS teaching model is designed based on experiential learning theory [14]. The combination of the OBE concept and the BOPPPS teaching mode has achieved a good teaching effect in teaching practice.

4.5. Strengthen school-enterprise cooperation in running schools

The establishment of cooperation with enterprises and industries can make up for practical teaching links with the advantage of resources and technologies of enterprises and combine such advantages of enterprises with college teaching to realize the in-depth development of integration of production and education, which can greatly improve the training of applied computer professionals and serve the society. Starting from the demand analysis of talent training, combined with the characteristics of local colleges and universities, a deeper and more comprehensive analysis of the school-enterprise cooperation mode of talent training will effectively promote the implementation of this mode and improve the training quality of applied undergraduate talents [15]. In short, strengthen school-enterprise cooperation, learn from each other's strengths and create a win-win situation.

4.6. Improving school-running characteristics and strengthening computer specialty characteristics are in urgent need of applied talents

It is an important measure for higher education to adapt to national development strategy and market demand to improve school-running characteristics and strengthen application-oriented talents urgently needed by computer specialty characteristics.

(1) Building characteristic education: according to the actual situation of the school and regional characteristics, build a unique computer education brand.

(2) The implementation of dual certificate education: students are encouraged to obtain the corresponding industry certification while obtaining the graduation certificate to improve the employment competitiveness of graduates.

(3) International vision of open cooperation: to carry out exchanges and cooperation with international universities and institutions, introduce high-quality educational resources, and cultivate computer professionals with international vision.

(4) Reform of teaching evaluation mechanism: Establish an evaluation system based on student's ability and results, and comprehensively and objectively evaluate students' professional quality and skill level.

Through the above measures, we can effectively improve the school-running characteristics of the mathematics major and cultivate the senior application compound talents in line with the urgent needs of society.

5. Summary and outlook

5.1. Summary

Through the integration of the OBE education concept into the teaching reform exploration process of accounting majors, through the teaching reform, optimize the curriculum system, and constantly improve the talent training program, the training of computer talents in our college has clear objectives and clear positioning. The college fully implements the fundamental task of cultivating morality and talents, and strives to cultivate application-oriented high-quality computer professionals with all-round development of morality, intelligence, physical fitness, and labor to serve local economic development with the goal of "four wins," "five basics" and "six

satisfaction."

5.2. Outlook

Based on the educational concept of OBE, according to the national standards and national development strategies, accounting majors should be adjusted to keep up with the requirements of discipline and professional development.

5.2.1. Adjust the major setting according to the OBE concept of the talent training program

The applied knowledge of accounting specialty changes rapidly, so it is necessary to adjust the specialty in time to meet the requirements of talent training. In the process of major adjustment, new knowledge is constantly absorbed, and new knowledge is combined with current technology to serve students to truly apply what is learned and realize the integration of major and new knowledge.

5.2.2. Attach importance to the cultivation of teachers' practical ability, strengthen the construction of teachers' team and improve their comprehensive ability

The update cycle of computer knowledge is short, the change is fast, the traditional knowledge is not firmly mastered, and the new knowledge will replace the old knowledge, which requires teachers to adapt to the self-learning ability and the ability to learn new knowledge, teachers should constantly enrich themselves, improve their comprehensive ability and practical ability to meet the teaching requirements, and constantly improve the teaching level in the teaching process.

5.2.3. Strengthen the cultivation of students' practical ability

Through the influence of the OBE teaching concept, strengthen the development of practical ability cultivation from the traditional teaching method to the student-centered teaching mode, and constantly improve the level of students' practical ability.

5.2.4. Strengthen the university-enterprise comprehensive strategic partnership

Traditional education and teaching are undertaken by colleges and universities themselves, and colleges and universities only teach according to talent training programs, so the graduates they produce cannot meet the needs of society. With the development of today's society, education has risen to a high level, education is not undertaken by colleges and universities, but by society and enterprises to complete together, through the cooperation of schools and enterprises to cultivate talents are the needs of today's social development.

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Disclosure statement

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