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Analysis of Teaching Model Reform of Big Data Major in Secondary Vocational Schools Based on CBE Teaching Model

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Abstract: With the improvement of social informatization, the application of big data technology in various industries is becoming more and more extensive, and its influence is constantly increasing. This requires applicants for relevant positions to have sufficient information technology skills and strong learning abilities. Obviously, traditional teaching models are gradually weak in meeting the needs of current students and employers. The CBE teaching model starts from the demand end, which emphasizes the cultivation of students' vocational ability in specific positions in teaching, which is highly targeted and practical. This is consistent with the occupation- oriented education concept of secondary vocational colleges and the characteristics of big data major. This paper starts from the teaching of big data in secondary vocational schools, analyzes the traditional teaching model, and explores the reform path of teaching model based on the CBE teaching model.

1. Research Background and Significance

The wheel of The Times rolls forward, and the world we live in today is changing rapidly. As the society has entered the era of big data, the huge amount of complicated and redundant data has now become a treasure sought after by countless industries. At the same time, it has also caused a large gap of talents related to the big data industry. Although most vocational colleges have the major of information technology, there may be classes focusing on big data in the major, and some vocational colleges have even set up big data major. But the talent gap is still not reduced, more vaguely expanding trend, the lack of big data industry related talents can be seen[1]. Our country is in a stage of rapid development, not only quantity, but also quality, so the quality requirements of talents from all walks of life are also improving year by year, and major in big data is no exception. In order to meet the needs of the development of big data industry, major in big data of secondary vocational schools combined with industry needs are also constantly deepening education reform and exploring and innovating the traditional teaching mode[2]. The author analyzes and studies the teaching model of big data in secondary vocational schools, providing suggestions for the integration of CBE teaching model and vocational schools, and providing reference for vocational schools to reform the existing teaching model based on CBE.

2. The Problems Existing in the Traditional Teaching Model of Big Data Major in Secondary Vocational Schools

(1) Unreasonable curriculum setting and single teaching method

The curriculum of big data major in some secondary vocational colleges is not reasonable and systematic[3]. The main problem is that theory and practice cannot be effectively combined, and there is a phenomenon that theory is more important than practice. Although some secondary vocational schools have set up relevant practical training courses, the proportion of class hours is not high, and most of the practical training projects are repeated piles of simple cases, lack of correlation between knowledge points, and the real enterprise big data industry work content gap. In the theory class of big data major in secondary vocational colleges, the main form is teacher explanation on the platform, adopt "cramming" teaching, students passively listen to the lecture below, occasionally participate in the classroom interaction, teaching efficiency is not high, the effect is not obvious.

(2) Lack of attention to the practical training link, the direction of talent training is fuzzy

On the one hand, the existing teaching model of secondary vocational schools is too simple, and the curriculum of big data is not reasonable enough, and the emphasis on practical training is not enough. As a result, teachers' teaching objectives are difficult to be clear in the current teaching, which results in that students in secondary vocational schools cannot combine theory with practice well, and their ability to put theoretical knowledge into practice needs to be improved[4]. At the same time, there is also a phenomenon that although the training base is established, the practical training course becomes a mere formality, and the teaching model is very similar to the theoretical course. The teachers of the whole practical training course drill in the teacher's computer in a large length, without giving enough training practice to students, resulting in the practical training course is greatly reduced, resulting in the result that students' practical ability cannot be significantly improved[5]. On the other hand, due to the particularity of the big data industry, data is the lifeblood of every enterprise, so secondary vocational schools lack of cooperation with enterprises in the training of big data professionals, resulting in few opportunities for students to experience data operation in person. Therefore, most students cannot enhance their data thinking and data processing ability through internship. In teaching, not paying attention to practical training is not good for students' future development; For graduates, they are generally engaged in data management work in enterprises, but due to the lack of practical experience of students, enterprises have to increase investment in the induction training of new employees and data management skills training, resulting in the waste of enterprise resources.

(3) The construction of training base needs to be improved

Huge data has high requirements on computer performance. For big data majors in domestic secondary vocational schools, some schools are limited by funds, hardware constraints, and local policies, leading to some problems in the construction of practice bases[6]. The problems are mainly manifested in the lack of computer equipment, old computer equipment, backward computer peripherals, software version to be updated, lack of practical training data, etc. As a result, systematic and immersive training is difficult to carry out.

(4) Lack of conformity between curriculum and talent demand

For the big data industry, different positions require different abilities, and with job segmentation, the requirements for talents in the big data industry are increasingly high[7]. However, at present, in the teaching process of secondary vocational schools, some schools do not follow the development trend of the industry and synchronously update the training content and methods. They still use the original teaching materials, teaching plans, teaching methods and contents for teaching, and fail to improve the new requirements for talents in the rapidly developing big data industry, which greatly

reduces the teaching effect.

(5) The teaching staff of secondary vocational schools lack practical experience in enterprises

Teachers are the most important source for students to acquire knowledge and skills, and the number and quantity of teachers have a huge impact on students' acquisition of professional knowledge, cultivation of practical ability and mastery of professional experience. However, most teachers in the current major do not have relevant experience in the big data industry, but only pay attention to the educational background of teachers when recruiting teachers. It seems that there is a significant positive correlation between educational level and teaching ability[8]. These teachers tend to lay emphasis on theoretical knowledge rather than practical ability in teaching, and are limited in the cultivation methods and contents of students' ability to engage in big data industry. In addition, as the major of big data is a relatively new major compared with other traditional majors, young teachers account for a large proportion, and young teachers do not have enough teaching time and work experience in related industries, so there are bound to be some problems in teaching.

3. The Concept, Characteristics and Feasibility Analysis of CBE Teaching Model

(1) CBE teaching model

Competency Based Education (CBE) is competency based education. CBE teaching mode has been widely used in the United States, Canada and other countries. It starts with the training of students' vocational abilities and pays more attention to the training of students' abilities in the teaching process. The educational ideas and concepts contained in it are worth learning form[9]. The core concept of CBE teaching model is that the whole teaching process revolves around how to equip the educate with the necessary vocational ability for a specific post. However, this ability cannot be understood as only operational ability and hands-on ability. Instead, it is more emphasized a s a comprehensive vocational ability, which roughly includes four aspects, namely knowledge, attitude, skill and feedback[10]. The teaching model of CBE emphasizes the refining, learning, mastering and finally applying the abilities required by the post. These abilities are not only the starting point of the teaching model of CBE, that is, the teaching objective, but also the baseline for judging the teaching process. And the CBE teaching mode pays attention to "learning" throughout the whole process, fully realizes the student -centered learning, deeply implements the "people- oriented" student concept, and provides a new foothold for secondary vocational schools to deepen the reform of teaching mode.

(2) The characteristics of CBE teaching model

The typical characteristics of CBE model are mainly reflected in the following aspects [11] : 1. The teaching objectives are set clearly and targeted, and all serve to cultivate students' comprehensive vocational ability; 2. Second, the teaching is student -centered, pays attention to the cultivation of students' personal ability, and is good at giving full play to students' subjective initiative; Third, whether before class or in class, students are mainly self- study, teacher guidance as a supplement, at the same time after class students self -assessment, conducive to improve the enthusiasm of students, at the same time to strengthen the students' self-reflection ability to review;Fourthly, the teaching method is unique, which can stimulate students' interest in learning on the basis of ensuring a serious classroom atmosphere.

(3) Feasibility analysis of applying CBE teaching model to Big data major in secondary vocational schools

CBE teaching mode attaches great importance to vocational ability, and determines the assessment method and content according to the actual needs of the employing departments. It focuses on ability cultivation and takes mastering ability as the evaluation standard, which makes the content learned by student s extremely practical. In essence, it adopts the idea of solving

problems from the demand side, "teaching will teach what the post needs". According to the actual post needs to develop the teaching content. At the same time, because the CBE teaching mode always puts students in the center position in teaching, the concept of "people -oriented" runs through the whole process before, during and after class, which increases the enthusiasm of students to learn and allows students to maximize their creativity.

The teaching mode of CBE focuses on the cultivation of practical vocational ability, which determines that its characteristics are more suitable for secondary vocational education. The positions of big data industry are highly targeted, operational ability accounts for a relatively high proportion of all abilities, and vocational ability is easy to determine and describe. These characteristics coincide with the teaching mode of CBE. At the same time, the teaching mode of CBE also has the characteristics that the traditional teaching mode does not have. See the Table 1 for the comparison:

Table 1: CBE vs. traditional

	CBE teaching mode	Traditional teaching mode
purpose	cultivate power	Transfer knowledge and skills
Teaching objectives	Specific and operable	general
position	Students are the main ones, and teachers are the assistant ones	Teacher-oriented
Teaching methods	Students' autonomous learning and independent evaluation	Teachers give priority to teaching and students learn passively
Student enthusiasm	Fully motivated and motivated	students' enthusiasm depends on their self-consciousness
Assessment content	Performance of ability	Test and examination results

4. Reform of Teaching Model of Big Data in Secondary Vocational Schools under the Teaching Model of CBE

(1) Clear learning objectives

It is necessary to make it clear that the focus of teaching is to learn rather than teach. In the process of teaching, the way, method and quality of students receiving guidance profoundly affect the results of teaching. Popularize the concept of CBE teaching mode to student s at the beginning of the course, explain the difference between CBE teaching mode and traditional teaching mode, and introduce to students the training methods, assessment standards and assessment requirements for mastering the ability of this course. In this way, students will be clear about their learning tasks and goals to achieve. The abstract learning objective is transformed into a concrete and operable introduction of vocational ability, which changes the unclear learning objective of students in the traditional teaching mode, and also enables students to make clear how much they have mastered and what skills they have in the whole learning process.

CBE teaching model has very clear learning objectives, students must go through specific ability training and assessment standards before graduation, and realize seamless integration with the big data industry positions, students will become highly suitable for the needs of employers after graduation skilled talents.

(2) Students' learning initiative

The teaching model of CBE overturns the traditional teacher -led teaching method, allowing teachers to spend more time in the "spectator position", and emphasizes students' independent

initiative and creativity in the whole teaching process. Teachers transform from direct sources of knowledge infusion into catalysts for student s to master knowledge and skills, appearing at appropriate times and providing appropriate guidance to students. This kind of classroom that puts students in the active position in the teaching process and teachers play a supporting role makes students change from "receivers of knowledge" to "learners of knowledge" or even "creators of knowledge". While vigorously supporting students to play the initiative, students will also show strong enthusiasm and change from passive acceptance to active learning.

(3) The selection of teaching materials is diversified

In the traditional teaching mode, student s usually only choose one set or even one textbook for a course, and the way to acquire knowledge is not broad enough. However, the CBE teaching mode requires the provision of a variety of multimedia learning materials that are compatible with relevant vocational abilities. For example, the major of big data can provide materials related to data processing thinking, industrial post standards, relevant post interview questions, conferences related to big data industry and other textbooks for students to choose and learn.

(4) Practical training tasks

CBE teaching mode is based on ability and emphasizes vocational ability, which has higher requirements for simulation of practical training environment. Therefore, the training room is the basis for the implementation of the CBE teaching model. The training room is a professional teaching place, in which there should be a high degree of restoration of work scenarios and resources. For big data major, it means a high configuration of computers, real data processing software, real training tasks and real data. As CBE teaching mode focuses on student s' individual and active learning, practical training data and real work tasks must have a considerable scale to meet the development needs of students. When introducing the real task, students will consult the relevant information by themselves. According to the work requirement s, students will start from the data import and query, and independently complete the whole work task of data processing to meet the task requirements. And this operation process has no standard answer, only look at the results of the task, each student may use different methods, received since childhood "linear" education let students used to refer to the standard answer, this real work situation without standard answer, to the students brought a greater challenge. Task analysis requires students to have the thinking ability of data processing; To complete the task requires students to have a solid theoretical foundation, skilled operation skills; The self-assessment at the end of the task requires students to have the ability of objective reflection. Therefore, the practical training task is also a way to test the comprehensive quality of students.

(5) Interesting learning content

As an old saying goes, interest is the best teacher. In the design of practical training projects, we should try our best to choose the content that is closely related to students' life, so as to improve students' learning enthusiasm, let them know where data processing ability is needed in life, and let students feel that data is everywhere, from enterprise data to family information. All kinds of data are filled in our daily life. For example, in the operation of adding, deleting, modifying and checking the data, students can fill in some basic information such as name, gender, birthday, hobbies, etc. and then directly use the source data for students to write the data, and then design actual situational tasks on this basis, such as new transfer student s, students transfer, student information change, student information query, etc. At the same time, after collecting the data, we can show the similarities and differences of data formats. For example, if someone writes YY. MM. DD format on the birthday, someone may write YY/MM/DD format.

(6) "Double qualification" of the teaching staff

"Double-qualified" teachers refer to those who have both theoretical and practical teaching qualities, or those who have both teacher qualifications and engineering and technical qualifications.

In view of the problems existing in the teaching staff of big data specialty, secondary vocational schools need to strengthen the construction of teaching staff. Encourage teachers to continue to learn and improve, strengthen cooperation between schools and enterprises, and regularly organize teachers to visit and exchange actual positions in other colleges or enterprises, which not only needs to improve teachers' teaching ability, but also needs to improve teachers' specific post working ability and professional quality.

(7) Scientific evaluation mechanism

The teaching model of CBE attaches great importance to student self-assessment and group mutual assessment, which is based on giving full play to students' subjective initiative and implementing students' main position in teaching. Therefore, it is necessary to improve the evaluation of students' comprehensive ability, practical ability and timely feedback mechanism. In the complete teaching process, the establishment of the evaluation mechanism should be formulated by bot h parties and implemented by multiple parties, and a comprehensive teaching result evaluation system including teacher evaluation, student self-evaluation and student mutual evaluation should be established. The evaluation standards are dominated by technical experts, reflecting the line with the actual work, teachers give opinions base d on learning conditions, reflecting the teaching in accordance with their aptitude.

5. Conclusion

Since the CBE teaching model was introduced into China in 1992, it has been applied in many majors of secondary vocational schools, higher vocational schools and undergraduate schools and achieved quite good results. Its own inherent logic also confirms the meaning of the word CBE: education based on ability. With the development of society, informationization has become an important label in today's society, and data is the basis of all information. The ability demand of big data-related industry posts also keeps up with the speed of social development, and the importance of skills and abilities rises accordingly. CBE teaching mode faces the post demand, configures the learning content according to the specific post ability, and cultivates the skilled talents in line with the post. It is highly suitable for the educational concept of secondary vocational schools, which determines that the CBE teaching mode will be one of the best teaching modes in secondary vocational schools. The educational concept of "people -oriented" and "student-oriented" contained therein solves the problem of students' learning enthusiasm, and enables student s to change from the traditional teaching mode of "passive acceptance" to "active learning". The application of CBE teaching model in the teaching of big data majors can improve the efficiency of education and teaching, optimize the effect of education and teaching, and enhance the working ability of students after graduation, so as to improve their competitiveness in the talent market, which is of great significance to the employment of students, the enrollment of schools and the sustainable development of big data majors.

It is hoped that this paper can provide a path for the reform of teaching mode of big data major in secondary vocational schools, and provide a reference for other majors to integrate CBE teaching mode.

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