BioTechnology

Reform and innovation of the high vocational public computer curriculum based on the vocational integration

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ABSTRACT

Based on the vocational integration, this paper presents a new teaching scheme of the high vocational public computer curriculum based on the application of the main line and the standard of the ability, and formed a curriculum system which emphasizes the vocational skills training, business-oriented and demand-oriented, and learning through the use of examples, such as teaching tools fully inspired the students to learn driving force, and strengthen the ability of students of vocational training. This paper proposes and practices the curriculum construction principles, the curriculum development principles and the teaching resources construction of the high vocational public computer curriculum. It puts forward constructive ideas of the rationalization and puts forward the implementation of classroom teaching with Flipped Class Model and Micro Lecture. It Puts forward and practice the teaching mode which carries on the teaching according to the following order: item analyzing, knowledge points analyzing, task implementation, summary and improvement, and knowledge expansion.

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KEYWORDS

INTRODUCTION

The high vocational public computer education is based on the information technology. By the computer technology learning, the student can master the computer application ability, which is necessary in his occupation career.

In the new period of development, the high vocational public computer education faces many new problems. Mainly concentrated in:

1) With the more integration of computer technology and other disciplines, the high vocational public computer courses need to accommodate the social needs of curriculum system.

2) The teaching content determines the quality of the education of the students. The content selection of The high vocational public computer courses need to achieve to market demand as the goal, to serve for the purpose, to take the employment as the guidance.

3) With the ordinary senior high school "information technology" curriculum and occupation high school computer ability training as the important teaching contents, basic computer education has not "zero point", how to balance the students differences and achieve the unity of the teaching goal is the ur-

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gent problem.

Compared with other public courses, the high vocational public computer courses have the particularity:

1) The high vocational public computer courses are to train the students' computer application skills, belonging to the training of general ability skills courses.

2) The computer has penetrated into all industries, different industry demands different computer capacity. The courses should be combined with the industry demand.

3) Because of the rapid development of computer technology, the computer knowledge has been updated when the students are graduated. The teaching content must follow the market change, must fully develop the following computer learning ability.

Therefore, in the curriculum of the high vocational public computer coursed must fully consider their particularity. It is necessary to design courses context according to the requirements of the industry for their knowledge and ability.

CURRICULUM CONSTRUCTION PRINCIPLES BASED ON THE VOCATIONAL INTEGRATION

We established the "application oriented, three combinations" curriculum construction principles which the society oriented application is the only goal, the curriculum theory research can be combined with the characteristics of higher vocational education, teachers can be integrated with the enterprise, and the research can be combined with the practice of curriculum reform. Through in-depth study and practice, we can establish the teaching system of computer public curriculum and teaching resources that are based on the application as the core, demand as the guidance, and distinctive characteristics of the higher vocational education.

1) The curriculum design changes to the application as the core, to demand oriented higher vocational public computer course teaching system from the traditional to introduce the basic functions of the basic knowledge of computer and software as the core of the teaching system.

2) The contents of teaching require combination of basic and application. The content of teaching need to be designed to occupation post ability as the standard, be advocated the student-centered education concept which is focused on training students' project analyzing, designing and technical development ability and cooperation ability, understanding with the business work atmosphere, and laying a good foundation for the "zero distance employment".

3) Teaching design to meet the overall objectives and teaching process. Vocational students need to directly to the occupation employment, so the aim and contents of curriculum need constantly adapt to change occupation post ability requirements. Vocational education and occupation practice should be combined closely, by emphasizing the importance of occupation skill training process and the related theoretical knowledge of the study to the process of cultivating students' ability.

4) Curriculum organization and implementation should pay attention to work process oriented. The teaching process should take the work process of typical occupation activity oriented around the core, training target, the creation of situational teaching environment, simulating the real environment by enterprises, teaching methods according to students' cognitive level, training to strengthen students' computer application and development ability, cultivating students' occupation quality.

5) The textbooks should be based on the working process. As a carrier of teaching content, the textbooks need be arranged according to the work process, the curriculum standard and the enterprise engineering standard organic docking.

The high vocational public computer curriculum based on the vocational integration is showed on the Figure 1.

CURRICULUM CONSTRUCTION IMPLEMENTATION BASED ON THE VOCATIONAL INTEGRATION

1) By deeply investigation and research, we can understand the business needs for computer application talents. By tracking survey of graduates, we can know the students' knowledge and skills gaps
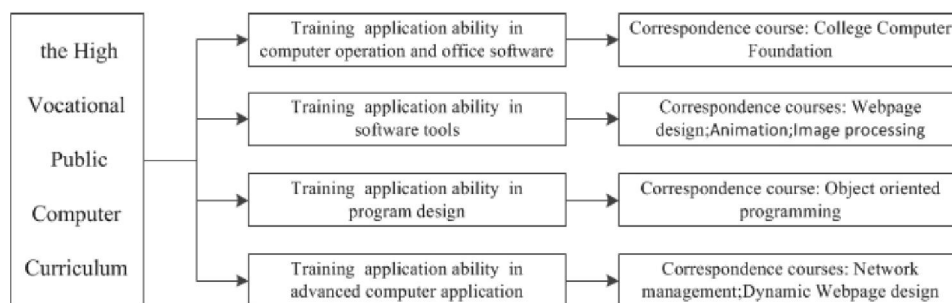
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Figure 1 : The high vocational public computer curriculum

between learned in school and expired in enterprise. By investigating computer ability that the new students have mastered, we can know the current situation of computer application ability that the middle school students have.

2) According to the research results, we can establish the teaching system of the high vocational public computer course based on the application as the core. By selecting and refining the practical application of the project, we can organize the content of teaching based on the work process principle.

3) Curriculum design should focus on ability oriented. Design course teaching task should be based on the teaching objectives. Determining the capacity required for the course should be based on task requirements. The teaching process should be based on the required capacity. On the curriculum aim, through the creation of context teaching environment, it can stimulate the students' desire for knowledge and cultivate the students' ability of engineering practice.

4) Full implementation the teaching method of "Problem-Based learning"(the PBL teaching method). Because the students' computer knowledge is "non-zero point", the students will be able to integrate relevant knowledge by combining the PBL teaching mode and traditional teaching methods. In the application environment and through heuristic teaching, we can promote the students mastering the basic knowledge, the development of high-level thinking skills, problem solving ability and autonomous learning ability.

CURRICULUM CONSTRUCTION ACHIEVEMENTS BASED ON THE VOCATIONAL INTEGRATION

Principles of curriculum construction

1) Curriculum aim should be based on the occupation career development. Public computer curriculum in vocational college should be based on the student occupation career development direction, providing students with a variety of options, enabling students to obtain the development of personality and jobs need to be consistent with the occupation ability, laying the foundation for student's occupation career development.

2) The curriculum content should be based on tasking line. The curriculum content must be matched with the task according to the logic. Starting from the demand for jobs, the curriculum content should be allowed students to enter the working practice experience as soon as possible to, provided the complete process of learning opportunities, and gradually realized the transformation from the learner to the worker's role.

3) Organizing the curriculum content should be based on occupation ability. By forming around the occupation ability, we can organize the curriculum content, integrated the corresponding knowledge and skills based on task as the center, and cultivate of students' work in the complicated process of comprehensive occupation ability.

4) Teaching activities should be based on typical working process. According to the process design of the learning process, we can establish the contact between tasks and knowledge skills, enhance the students' visual experience, and stimulate the students' interest in learning.

Principles of curriculum development

Students' learning objective is to competent occupation job requirements, to meet the needs of social development, while develops their personality

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and adapt to the individual development needs. The general principle of curriculum development is "the curriculum teaching goal design based on tasks, it determines the ability of students according to mission requirements, the teaching objectives implement according to the required capacity". Therefore, in the choice of curriculum ideas and knowledge, we mainly adopt the following principles:

1) One of the curriculum ideas is "have for, have not for". Vocational education is to train talents with basic skills which are the production management of the first line needs strong hands. The key point of the curriculum reform is to change the traditional teaching idea. The main practices include to improve the teaching efficiency, to prevent blindness, to introduce the new technology, to abandon the content which is outdated, and now less than, later also not to use.

Another of the curriculum ideas is "business oriented, demand-oriented". The core of the curriculum reform is to adapt to the needs of the enterprise, to turn knowledge into skills, and to apple skills for the purpose. Through the investigation and analysis of the actual demand of enterprises, we put forward the practical application of the process demand made into a comprehensive project. By creating real working environment, the students can really improve the computer application ability of dealing with complex affairs in the process of completion of the project.

2) One of curriculum knowledge selections focuses on practical. Knowledge point selection should be covered in the comprehensive enterprise project in the actual application process, should reflect the "application oriented, characteristics of Higher Vocational Education Oriented by demand". The second of curriculum knowledge selections focuses on typical. Knowledge point selection should be the development and application of functional characteristics of outstanding software. The third of curriculum knowledge selections focuses on Hierarchy. Knowledge point selection should be from shallower to deeper, step by step that according with the students' cognitive law and the ability to accept. The last of curriculum knowledge selections focuses on cohesion. Knowledge point selection should take

into account the basic computer education in middle school that the high school computer basic education can transit to university smoothly.

Principles of the construction of teaching resources

The construction of curriculum resources should start from two aspects to establish effective and practical teaching resources. Teachers need to consider what and how to teach. From the curriculum teaching resources and curriculum organization and management of resources, the teacher can provide reference and application of resources for students. Learners need to solve what and how to learn by evaluating the learning effect as the main basis.

Therefore, the construction of curriculum teaching resources should include principles:

1) Sharing. Teachers should realize the sharing of computer basic teaching content between each module that avoids repeating construction.

2) Modular. The resource content should combine the professional teaching related to the need for teaching design, organization and classification, assembly into modules, improving the efficiency of teaching.

3) Open. Teachers can use other courses module modules course library free to choose sharing, optimizing teaching design, and improving the preparation efficiency.

4) Scalability. Module content course database structure can fill in any course, by which we can realize the sustainable development of library.

The course of "college computer foundation" under Principles of curriculum construction, curriculum development and construction of teaching resources are shown on TABLE 1.

CURRICULUM IMPLEMENTATION SCHEME

Computer culture and life module

Through the computer culture introduction, the students can understand the hot and trends between the computer and our daily life, grasp the basic concepts and the principles of computer and information technology.

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TABLE 1 : Construction achievements of "college computer foundation" course

Project case	The corresponding knowledge points
he new technology of computer	Basic knowledge of computer
The tabloids - recruitment notice	The software of "Word" basic application
Making students articles of Association	he software of "Word" advanced application
Class attendance and performance statistics	The software of "Excel" basic application
The scholarship evaluation	The software of "Excel" advanced application
Volunteer activities publicity	The software of "PowerPoint" application

Beginning with "computer culture and life", it can improve student's study interesting by the introduction of the charm persons and typical event of computer technology, such as the history of computer technology, the future of computer, Princeton architecture, Turing Machine, the growth process of Bill Gates.

The students can master the computer network, information technology knowledge and the basic skills by the computer technology examples that they often use in the daily life. For example, students can understand the information technology coding knowledge, through the application of bar code, two-dimensional code. Students can understand the application scenarios and the development trend of computer technology by the application of Micro message, cloud computing, and bitcoin Technology.

Office software module

With the office software learning, students can master the advanced typesetting technologies, complex data analysis and processing technology and production of professional presentation technology.

Reflection on the teaching process whether cultivating the students' comprehensive ability of self-study and creativity, we change the office software training lecture according to the following order: item analyzing, knowledge points analyzing, task implementation, summary and improvement, and knowledge expansion.

By designing projects that overlay information processing of the entire process, we can cultivate students' comprehensive skills and improve students' ability of information processing that include Information search, information arrangement, information processing and information analysis.

In office software learning, we should cultivate students' basic abilities of Computational Thinking gradually. For example, in the IF function of EXCEL teaching, it can:

(1) Guiding students to think problems in small case. For example, there is one small game that is to reward according to game integral. The reward rule is, if the game winner's score greater than or equal to 20000, he would get 1000 bonus points. If his score greater than or equal to 15000, he would get 500 bonus points. Otherwise he would get 0 bonus points.

(2) We can divide the reward into flowchart shown in Figure 2, this can cultivate students' basic computational thinking gradually.

(3) Based on the flowchart, it can realize the IF functions. As shown in Figure 3, the formula of the reward points for John (C3 cell) is "=IF (B3>=200001000, IF(B3>=15000500,0))", the formula calculation results is 500.

Computational thinking module

We can cultivate students' Computational Thinking by the general understanding of problem solving process and with the RAPTOR.

RAPTOR is the Rapid Algorithmic Prototyping Tool for Ordered Reasoning. RAPTOR development environment is visualization. The RAPTOR program is actually a directed graph, can one to execute graphic symbols, in order to help users track RAPTOR program stream execution process.

Combining computational thinking with daily life, we can vividly to teach basic idea of Computational Thinking to students with the "problem modeling→Problem analysis→Finding a solution→Scheme comparison→Scheme".

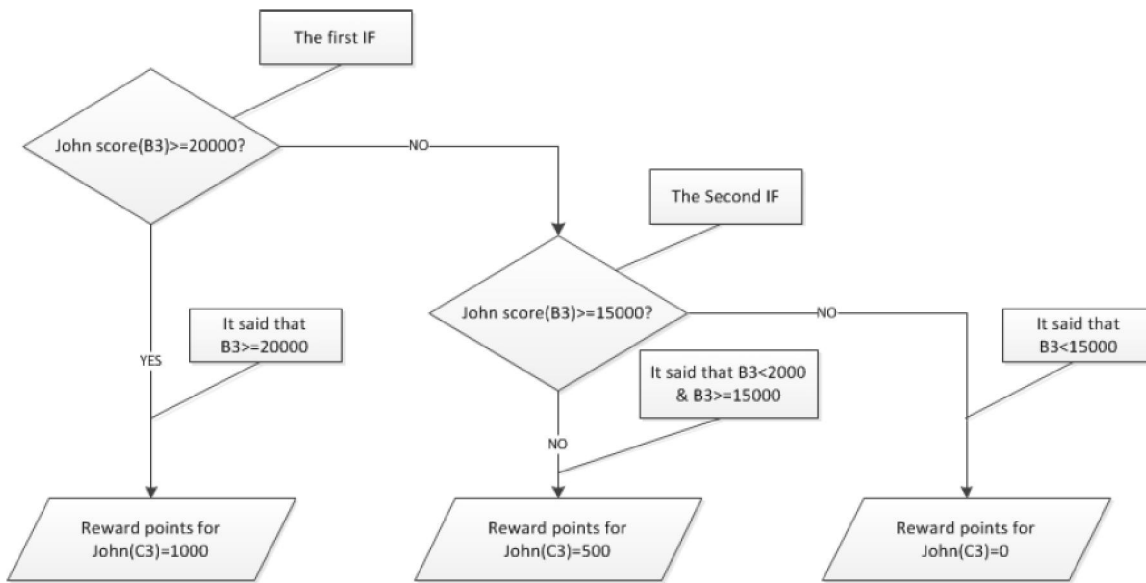For example, in explaining the "dichotomy" lookup method, the design problem is:

Figure 2 : Flowchart is used to cultivate the basic computational thinking ability

Figure 3 : The flowchart conversions to functions

In one party, there is 1 draw game. The host extracts any 1 number (numbers ranging from 1 to 32), now, how much is for you to guess the number of hosts on the hand. Guess rules is:

You can ask the host problems, but each asked 1 times, you need $100 donation to the party, and the host answered "yes" or "no" for your questions. If you guessed the right answer, you can obtain $1000. How do you guess for "value for money"?

Based on discussion on students, teachers can do 1 game:

Assuming that one stuedent is the host, you selected 1 number (16). Now I ask:

Is greater than or equal to 16? (First students answer: yes)

Is greater than or equal to 24? (Second students answer: no)

Is greater than or equal to 20? (Third students answer: no)

Is greater than or equal to 18? (Fourth students answer: no)

Is greater than or equal to 17? (Fifth students answer: no)

My answer is: 16 is your hand number.

Then do the similar question, summary, only needs to ask 5 questions, you can get $1000 of award.

In this way, through the game participation, the students can quickly grasp the principle of "dichotomy" lookup method.

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In this way, through the game participation, the students can quickly grasp the principle of "dichotomy" lookup method.

Therefore, in cultivating computational thinking ability of students, we need focus on the algorithm of solving problem rather than the programming language learning.

We can use the RAPTOR to cultivate computational thinking ability of students. Raptor is a programming environment for a visual, as the computational thinking training to provide the experimental environment, by using the basic flowchart symbols to create and validate the algorithm, students can not only create algorithm visualization, by solving the problem itself is also a visualization.

Guiding education information into the classroom

With the integration of information technology and education in depth, Flipped Classroom proposed the traditional "teaching before practice" pattern into "learning before practice", it can let the students truly self-learning. Therefore, we can construct the flipped classroom platform and give full p play to the role of teachers to guide students to learn. Flip the classroom model can effectively solve the problem of teach students in accordance with their aptitude.

"Micro lecture" is based on the video, it includes the teacher's teaching and learning activities of the entire process that around a certain knowledge point in the process of teaching in classroom and outside classroom education (mainly doubtful and difficult).

"Micro lecture" is less than 10 minutes usually, and there is a clear teaching objectives, content of short, small courses focus illustrate one problem. Therefore, we can make corresponding "micro lecture" according to the curriculum difficulty. In the "micro lecture ", the key lies in integration of resources, teaching evaluation and feedback interaction.

CONCLUSION

For employment capacity requirements, we established "Vocational Public Computer Curriculum System of the training mode of Applied Talents in the enterprise application as the goal", and prac-

ticed the course construction of "principle to the application as the core".

We have proposed and practiced "curriculum design task based on the teaching objectives, the abilities required according to mission requirements, curriculum development principles of developing the ability of teaching according to the required capacity."

We have combined the PBL teaching method with traditional teaching method. Through the simulation of the actual project as the main line, we have constructed the integrity of instructional design, students can feel the reality of the actual demand of practical work, fully arouse students' learning motivation, cultivating students' computer application ability of comprehensive, guidance of autonomous learning and innovation of students' learning, exercise students of learning skills.

We use the working process of the thought of writing textbook based on curriculum standards, docking and enterprise engineering standard. Textbook comprehensive case complete structure as the main line, with the project driven approach for the preparation, outstanding ability, has the positive significance to reform the teaching content and methods of public computer course, meet teaching goal of Higher Vocational education.

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