The Research and Practice of Classification Teaching Model of Basic Computer Education in Local College

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***Abstract*—**Establishing a new "2 + X" curriculum, which it relies on basic computer education for our current situation and combines with the actual teaching situation, supposes a comprehensively deepen reform on basic computer education. Under the guidance of curriculum, research focuses are classification teaching model, designed teaching programs, and it is used for building the computer knowledge system which undergraduates must have at information era, adapting the trend of the times, cultivating innovative talents. It has supposed teaching practice and get remarkable results with the diverse teaching platform, and proven that the mode appropriate to promote local college.

***Index Terms*—**basic computer education; curriculum; classification teaching model; teaching practice

1 Introduction

The basic computer education of non-computer-professional education steering committee of Ministry of Education drafted the *Some views are about future reinforcement on the basis teaching of compute*r which put forward *1 + X Program* of non-computer-professional education, i.e. a *the basis on computer of university* (compulsory) plus several key courses (required or elective)[1-3]. Our school is an engineering-based, labor, science, economics, management, culture, law coordinated development of a multidisciplinary university, the computer application skills of different professional fields which students require are also different. Therefore, we have *1 + X* under the guidance of the curriculum program, combining with the actual situation of our school, constructing basic computer education *2 + X* (a new curriculum system) adapting the knowledge system structure which students require, i.e. two compulsory courses and some elective courses. And the issue we have explored for many years is what education to be adopted, how to choose the teaching context, and what teaching platform to be designed to connect the basic computer knowledge of university and the information technology of high school much better, to make students combine the computer knowledge and professional knowledge better with the new curriculum., we designs the teaching plan and implements teaching content against classification teaching model of different courses ,with the guide of *2+X* ,after years of teaching practice and exploration.

The structure of the paper is as follows: Section II introduces the *2 + X curriculum*; Section III for "2 + X" in the course, introduced the teaching mode and teaching of its classification scheme design; Section IV summarizes the variety of teaching platform Under the implementation of the teaching content of the teaching effect, and finally a summary of the article.

2 Build "2 + X" Course

Combined with the actual situation of our school, demand from the students computer knowledge structure that built the computer for basic education "2 + X" a new curriculum system, which required two, elective many departments.

"2 + X" course system shown in Figure 1.

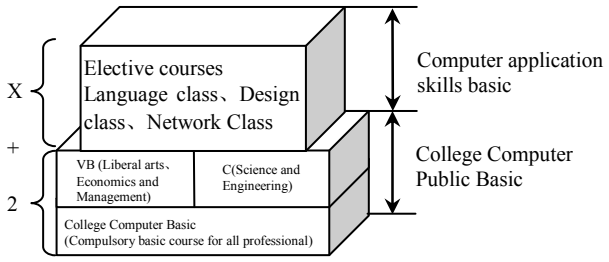

Figure 1. basic computer education "2 + X" Course

2 has two meanings, one refers to two aspects of curriculum, the second refers to the first level 2 course.

X is open in the second level, more elective courses, students according to their interests and professional needs of select at least two courses of learning.

The first level is the basic course as a university level course on basic computer, namely, "College Computer Basic" course and "Computer Software Design Basic" course. 'Basic Computer" course is a required course for students of each school, "Computer Software Design" course conducted according to the needs of different professional settings, the main open two courses that is"VB Programming" and "C Programming Language".

The second level is the basic course set up the computer after the specialty characteristics or the combination of teaching computer skills to improve curriculum that is computer application skills classes. This level of course taking into account relevant professional development and student's own interest, it set many types of elective courses which mainly high-level language, graphic design, network technology, multimedia technology, database technology and so on.

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3 Classification Teaching Model under the "2 + X" Curriculum

"2 + X' curriculum that my school computer, the basic framework of basic education, the student knowledge base, professional needs and development to carry out reasonable instruction, we developed an implementation plan, that classification teaching.

3.1 College Computer Basic

"College Computer Basic" course is the first door after the students enrolled in basic computer courses required for students enrolled in computer knowledge when starting a different situation, we set the general two types of tr- aining courses and enhance the class group for this course that we have adopted a "BUS education" model[4],. Regular classes the main train students in basic computer operation skills, including basic knowledge, Windows basic operation, Internet Applications and Office basic operation of office software to enable students to grasp the basic use of computer technology. Increase class aims to improve students advanced computer application skills, Including the advanced operations based on the basic skills, multimedia technology, database technology and network technology, Make the students of computer capabilities comprehensive practical applications. The teaching content is shown in figure 2 below.

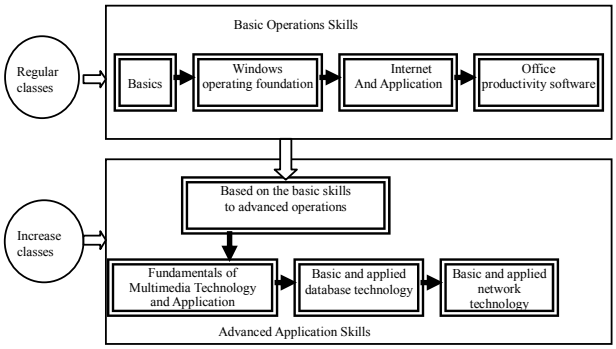

Figure 2. "College Computer Basic" Teaching content

Regular classes and increase class enrollment and examination were used to divide self-assessment combined manner. The beginning of the student enrollment for diagnostic tests on the machine test methods for the examination. Test module is divided into Part 7 that is "basic computer theory", "Windows operation", "Internet Basics", "Word2003 basic operation", "Excel2003 basic operati- on", "PowerPoint2003 basic operation", "Front-Page Web Production", Most of the students free choice test modules. after diagnostic tests that examination results are clustered according to statistical analysis.For those who are good students each module can apply for exemption of the course, direct access to advanced courses, to learn more deeper and modernized computer technology; while for those who have learned some modules students can choo- se a good school that poorly Module learning do not have all the learning. Instructional approach to modular to arrange for teachers to teach different knowledge of the corresponding module, multiple modules at the same time to open. Knowledge of teachers and students to choose modules, each module completed study for exams, the pass can enter the other modules of learning. The end of the semester, each student should get a certificate for all modules, or can not obtain credit for the course.

3.2 Computer Software Design Basic

"C Programming Language" and "VB programming" included in "Computer Software Design Basic".

C language is a high-level computer language, but it also has some characteristics of low-level language, both can be used to write applications that can also be used to write system software, which required the integration of expertise in teaching needs, emphasis should be different, for different curriculum. I turn to school "C Language Programming" course is divided into two categories: C1 and C2.

VB language is a visual programming tool, different types of arts for the specific requirements of the professional class there are differences, such as VB graphics, database programming, network programming and so on, teachers should select an appropriate and reasonable instruction. Therefore, our school to "VB Programming" course is divided into three categories: B1, B2 and B3.

Different disciplines on the "Computer Software Design Basic" course selection and curriculum requirements sub-category, specific settings shown in Table Ⅰ.

Table I. "Computer software design basic" course classification system

Category	Scope	Curriculum	Course Requirements	Teaching Objectives
C1	Electronic、Communicate、Letter Section	Data Type、Operators and expressions, Order structure、Select structure and loop structure of programming, Array definition and use of, Function definitions and calls, Pointer to the definition and use of, The definition of structure and use of file manipulation	Master the required course content knowledge, Professor of the course focuses on the application of C programming language system, For example, starting from the professional typical application.	Students rigorous program design、Flexible way of thinking and strong practical ability, Enable students to master complex software design and development, Professional courses of study for the follow-up to lay a solid foundation.
C2	To letter、Mapping、Machinery、Resources	Data Type、Operators and expressions,Order structure、Select the structure and the structure of	Master the basic content of courses,Typical control algorithm,In particular, to consider	Enable students to master the traditional structure of the general method of program

		programming cycle,Array definition and use of,Function definitions and calls,The definition and use of indicators	the degree of optimization,Focus on data analysis、Numerical Calculation Ability.	design,Students programming ideas and strong practical ability,Focus on training students in practical application development capabilities.
B1	Chemical industry、Environment、Traffic、Civil、Material	Programming Basics,Object-oriented programming concepts and design methods,Forms, controls, and menu design,Array definition and use of,Process definition and call,File operations,Graphical	Numerical capabilities of skilled training to master the course content,Focus on teaching the concept of object, interface design and coding,Prominent features of event-driven,Examples of use of the professional direction of processing stored data。	Enable students to master the basic object-oriented programming ideas,Students develop basic skills Windows applications,Improve students ability to solve practical problems,To lay the foundation for future study and application of。
B2	Management	Programming Basics,Object-oriented programming concepts and design methods,Forms, controls, and menu design,Array definition and use of,Process definition and call,File operations，Database	Courses required by basic knowledge,Focus on development and management system using VB,Including interface design and database applications.A complete integrated features typical examples reflect the content.	Enable students to master the basic object-oriented programming and design ideas,Students develop the basic method of management information systems,Students will improve the professional integration of the computer with the ability。
B3	Foreign language、Grammar、Arts	Programming Basics,Object-oriented programming concepts and design methods,Forms, controls, and menu design,Array definition and use of,Graphical	Familiar with the course content,Mainly basic concept and interface design,Focus is a vivid example to guide students,	So that students understand the basic object-oriented programming and design ideas,Help students write a simple application methods to improve creative thinking ability of students.

3.3 Optional Courses

We set a number of optional courses for students based on their interests and expertise needed to choose that addition to the core curriculum. These courses are for the future provision of major professional courses the students learn from computer skills necessary, as a powerful tool for teaching professional courses, At the same time strengthening the basic teaching of computer penetration and professional courses, that play a linkage effects. In order to rationally guide the students in course selection so that both can meet the credit requirements, but also enables the selected courses and the professional integration, we have developed recommendations to guide course selection, as shown in Table Ⅱ.

Table II. Elective guidance recommended

Expertise	Selected courses	Guide recommendations
Electronics, communications, to the letter, mapping, resource	VC + + programming or JAVA programming + computer communication network security or intrusion detection	The specialized computer skills are higher, and improve the development capability
Mechanical, civil, traffic	AutoCAD Design and PHOTOSHOP Graphics＋ Internet Applications or ASP Dynamic Web Page	Graphic processing skills require students to expand the students knowledge
Environment, the letter subjects	VC++ Programming or C# Programming＋ Computer Communication Network Security or Mat labExperimental Mathematics	Students professional system development capabilities, focusing on mathematical knowledge
Management, materials, chemicals	Access Database or VB.net Programming＋ Computer Communication Network Security or Internet Applications	Focus on student database operations and network applications
Language, grammar, art	FLASH Animation Design or PHOTOSHOP Graphics＋ Internet Applications or ASP Dynamic Web Page	Designed to train students interested in computers, reflects the professional characteristics

4 Diversified Platform of Teaching Practice and Teaching Achievements

4.1 Diversified Platform of Teaching Practice

Based the school's 10 classroom, a classroom teacher-student interaction, with more than 700 high-end PC's computing center and backbone, 1G BPS campus network environment, that Built the classroom, network, test centers and innovation base combination teaching and learning environment and teaching platform, to form the experimental teaching of classroom + Education + Innovation practice + network composed of multi-level, multi-platform of the modern teaching environment. based on such a diverse teaching platform to Implement of the teaching aspect of teaching practice.Following the "Col-

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lege Computer Basic "[5-6] and the "VB Programming"[7-8] two courses as an example to introduce the specific teaching practice.

"College Computer Basic" course with " Learn to urgently, practice leader, case-driven, inductive learning," the guiding ideology for the teaching, which content and application-oriented basic skills practice, emphasizing the combination of professional features, through technical, application and demonstration. "Learn to urgently" is the most commonly used software that front to explain to the students to grasp the basic operating skills for follow-up study and use of knowledge to provide a platform and tools and methods. For example, in teaching practice, we first taught the basic operation of Windows, Make thr students to understand the basic working principle of the computer based on the mastery of the use of computer hardware and software resources and management; then introduced the Internet application, for the students to facilitate effective and efficient access to information resources and tools; and various office software use of detail, so that students master the use of basic application software. "Practice pilot, case-driven" is the most prominent feature of this course is to practice operating mainly throughout the first gives a complete example of Teaching, and then make the tasks and problems, and then gradually refined decomposition, the formation of All small tasks, which leads to various knowledge points, and then use these theories to solve each task, and finally achieve the instance of the desired effects. To supplement the lack of cases, by "prompt", "try", "tips" and expand the knowledge points to ensure a comprehensive knowledge and im- prove their innovative ability. "Inductive learning" from the case pursuant to the whole, from specific to general cognitive rules to start teaching to make students learn gradually have summarized the main points of the knowledge framework, systems theory and so on.

For example, in explaining the computer system components, it will contact the students are most familiar with most of the "micro-computer application knowledge," explain in advance, thus summarized the general computer system and working principle, from specific to general, more in line with laws of cognition.

In the experimental teaching session, follow the "experimental" → "test" → "integrated design" of the steps, from the simple to the charge, from single to integrated, self-completed by students. Every part of the experiment by the mission requirements, operational tips, reflection, practice to improve the content of such composition, reflection and practice to improve the design according to different disciplines, different topics, so students can be better applied to professional practice. Such as: word speaking when the photo-text for engineering students design "circuit," "Flow" and so on.Designed for science students "mathematical formula", "physical formula" and "graph", "line graph" and other hybrid arrangements; for arts students design, such as prose, illustrations, etc. in English. Teaching practice such an arrangement, fully reflects the classification of independent and innovative teaching model. Assessment methods normally used to submit work and end of the paperless examination on a combination of both to enhance the students practical hands-on and creative ability of students and easy to grasp the situation in various parts of knowledge.

"VB Programming" to "project-driven" as the features in the instructional design to achieve the "project group cover knowledge, constitute a teaching plan and a project system", a breakthrough point to the level of knowledge of traditional progressive teaching model for the system. Each project will reflect the specific teaching process "VB Programming" course design in teaching new ideas. This new thinking in the teaching process mainly always implement the "Problem-, project-driven, practical training mainly on integration and training (theory) enough for the degree of" principle, so that students learn new knowledge of each point, has a complete, practical, specific, tangible projects as a carrier of knowledge and application of association, avoid staying in the fragmented, vague, abstract, boring the theoretical level. For example, the design of a project - making a simple calculators, first, ask questions and requirements of practical use calculators and basic interface, so students understand the project design goals. Then, according to the actual needs of each briefed on the Project involved to the knowledge points, such as popular control, text boxes, labels and Command button application methods of program design in the Order, Select and loop structure, to use common Function, And Control array The use of such knowledge. In order to explicitly introduce a knowledge point, can be interspersed among other typical examples. Theory about the process go beyond that to enable students to grasp basic concepts and applications, not detailed and in-depth, too. Combined lectures and experiments, interspersed between curricular and extracurricular, to content-based training, increased emphasis on training, the students arranged training exercises to develop their own practical ability. In addition, for solve the curricular hours less a lack of integrity of the project brought the shortcomings of the training, curriculum design link added to enable students to make full use of classroom time to complete an independent utility development process, to deepen understanding of this process for students language, increase the use of the knowledge to solve practical problems have a significant role. Curriculum links for the concrete implementation are the following:

1) to open the beginning of the semester in the course curriculum design layout of the task, give students time to prepare an entire semester and completed.

2) design course title library, the basic requirements are given for each subject and innovation requirements.

3) Students can choose from a question bank can also design their own topics, subjects identified through teacher certification license, but the emergence of a class of

students can not repeat the title.

4) require students to complete the task before the end of the course and write a design report.

5) organize students, curriculum design reply, ask students to explain design ideas, project features presentations and demonstrate the design project. Answer a question from the teacher.

6) According to the student design, the author of the design report and the reply given in course design performance conditions.

4.2 Teaching Effectiveness

"2 + X" course system of classification under the guidance of the concrete implementation of teaching in our school has achieved remarkable results, the basic curriculum to meet the reasonable needs of students in specialized computer knowledge architecture, which greatly stimulated the interest of students, improve learning efficiency and learning.

Diversified teaching platform based on the Practice of teaching effectiveness is reflected in the following points:

1) a general increase in student computer foundation and emergence of a number of talents. Every year I organize students to participate in mathematical modeling school competitions, and achieved excellent results (the two second prize by the international, national first and second prizes in a total of three provinces and one, second prize a number);
2) practical training of students writing ability. Basically, each college's website at school by our students out of their own development and design, such as the College's "Red River Valley" website;
3) students use computer skills, combined with professional content creation this graduation, there are many outstanding works, such as "WEB-based database development for mobile phones," was named outstanding graduate design (thesis), and the best graduate schools were included (design) technology;
4) of the students directly involved in teacher research projects; in cooperation with the psychological warfare division with 72 offensive and defensive training system, students served as art production, animation design, data editing and so on. Students under the guidance of teachers to complete the "Campus-based Students by real-time measurement system" has been put into operation;
5) various computer skills competitions and examinations to obtain excellent results, such as program design competition, web design contest, ITAT contest, the national computer grade exams.

5 Conclusion

Based on the actual situation in my school, made "2 + X" Course System program, in this system, the study of the classification teaching models and for different professional needs of students of different curricula and division, carried out in close connection with the actual teaching. 2 + X program under the classification system that the implementation of teaching and the use of diversified teaching platform, so that teachers and students have more space to display their space and learn, get better teaching results.

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