

Research on Training Pattern for Computer Major in Colleges Serving the Needs of Talents

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Abstract—Application-oriented talents are urgently needed in the field of computer science in recent years. However, there are weak links in teaching mode of computer science in the current technological development background. This paper puts forward the application-oriented teaching concept and applied teaching mode by exploring the ways, methods and modes of teaching reform in computer science and technology and has achieved good results.

Keywords—Modern teaching; Applied demand; Training pattern; Professional teaching

I. INTRODUCTION

With the development trend of economic globalization, information industry, network information technology, software application, automatic control technology and scientific management in various fields and industries of the national economy are developing rapidly. It is urgent to promote the deep integration of industrialization and informationization [1,2]. For this purpose, computer science and technology professionals have put forward new requirements [3].

Colleges and universities are the main source of talents in computer science and technology. In order to meet the needs of the vast market for professional talents and improve students' practical quality, At present, most colleges and universities are expanding the practice of computer applications and reducing the theoretical teaching hours [4]. Specifically, the theoretical inculcation hours in professional teaching are reduced, and the corresponding teaching plans and syllabuses are combined with engineering, practical and modern oriented "Internet +" orientation. The theoretical change of computer science and technology is much faster than other professional theories. This feature is the driving force behind the rapid advancement of information industrialization. It is also a challenge for the teaching of computer science and technology in colleges and universities. The original teaching method should be changed and explored according to the application needs when faced with the needs of the new situation.

The cultivation of their own competitiveness is the key to graduate employment for students majoring in computer science and technology [5]. This is because there are two sources of employment pressure. On the one hand, there is an increasing trend in the demand for talents in computer science and technology, but the number of graduates in the profession

and related majors is also increasing. According to incomplete statistics, about half of the colleges and universities in China have computer science and technology majors or related majors, and about four fifths of undergraduate schools have such majors [6]. On the other hand, cultivating students' practical ability under the traditional research-based mode can't be separated from the actual demand, which causes the students to face the dilemma of unemployment after employment [7]. Of course, the status quo of employment is not determined by one aspect alone, but the teaching model for the cultivation of modern applied talents and the deep excavation of following the teaching process will become an important driving force for changing the status quo of employment [8].

II. TEACHING STATUS AT THIS STAGE

The teaching model of computer science and technology in colleges and universities is still following the same model. The overall performance is characterized by the incompatibility between the basic ability of colleges and universities to train talents and social applications. Such a situation will slow down the advancement of information industrialization, and at the same time greatly affect the development of computer science and technology in colleges and universities. The main reasons for this model are reflected in the following two aspects.

A. Traditional professional teaching mode

The professional teaching model is gradually separated from the needs of the development of real technology. The syllabus for professional teaching in colleges and universities determines the four-year course of study for students. Teaching work is a huge phased system work. In order to ensure the order of teaching, each revision of the professional syllabus will be stable for a period of time. However, due to the accelerating development of professional technology, especially in computer science and technology, the speed of technical expertise is changing more rapidly. Such practice highlights the fact that current professional teaching models cannot match the speed of information technology development. As a result, the students have the corresponding knowledge theory when they graduate, but they do not have the corresponding technical experience. The huge dilemma in the face of employment has also followed. The root of the roots is that the particularity of knowledge updating in computer science and technology is not reflected in its teaching model. The necessity of the practical ability of computer science and

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technology has become an essential factor restricting the employment of professional students.

B. Teaching skills

Teacher training needs to be strengthened. The level of professional teaching in colleges and universities is essentially determined by the teaching ability and technical level of professional teachers. The technical level of teachers in these two aspects is also an aspect that requires constant updating of practical knowledge. The theoretical level and professional practice ability of teachers play an important role in guiding students' ability. Teachers also lack the opportunity to practice during their teaching. Even if they have had practical experience, they will face the dilemma of technical obsolescence over time. According to the survey conducted by the education department on computer majors and related professional teachers in China, more than half of the teachers engaged in computer-related majors have not received professional training and internships in the corresponding technical departments in the past three years.

There are two main reasons for this situation. First, the financial support of colleges and universities is limited. For a long time, the main funds of colleges and universities have been invested in the development of scientific research in addition to improving the teaching environment. Teachers' training is mainly focused on improving the theoretical quality and level of teachers, and the improvement of teachers' professional skills has not been mentioned in the important university development education planning, which has long been a policy-oriented deviation. Secondly, College teachers, especially young teachers, put most of their experiences in basic teaching, focusing on improving their theoretical level to meet the academic aspects of the assessment requirements of colleges and universities, neglecting the training of technical practice can't effectively combine theory with practice.

III. THE CONCEPT OF APPLIED TEACHING

The theoretical courses in computer science and technology have evolved from the initial technical education to the popular education in the development of higher education. At the same time, professional software companies such as Sun, Oracle, IBM, etc. are paying more and more attention to the ease of use of software. Operating systems and various development tools will become more and simpler under the continuous upgrading and improvement of these well-known software companies. Many technical low-level parts are encapsulated by them. A very complex feature in the past can now be implemented with just a few lines of simple code, and developers are slowly becoming blue-collar. Software companies need no more high-level technicians, but people who are proficient in business and familiar with an industry or field.

Higher education has long focused on theoretical knowledge rather than practice, and this status has been widely valued by educators. However, the basic position of theory cannot be ignored. In the specific teaching work, the practice is to coordinate with the overall concept, grasp the theoretical basis to promote the practical work, and promote the deepening of the theory with practical progress. In the teaching process

theory practice two lines go hand in hand. Teaching practice Applied teaching mode is to teach theoretical knowledge within the class. Outside the classroom, the small business management model is used to simulate the actual business operation. Encourage student participation in accordance with the company's complete work process, develop students' practical skills and be involved in the business-related knowledge required for their careers. In order to clarify the concept of applied teaching mode, this paper analyzes from the following aspects.

A. Practical power of training pattern

Education has always advocated improving students' practical and technical skills, with teacher-led teaching as the main training mode. In this mode, the students' ability to passivate for a long time is not diligent in thinking and not willing to do it. Exploring the new practice model is based on the student's "cultivation" of students as the leading idea, which is derived from the full expansion of the teaching philosophy of teaching and learning. As the way of thinking between students is closer, the understanding of the problem is clearer, and the students are psychologically easy to accept the feeling of not being taught. In addition, while the students are updating year by year, the computer professional technical knowledge is constantly advancing in this process of change, avoiding the outdated professional technology. Every year, colleges and universities are focused on the investment in scientific research. Therefore, the methods and means of scientific research must be based on computer simulation, simulation and program control. These tasks can be given to students as a practical task. Completion, that is to say, scientific and technological research is also the driving force for promoting student practice.

B. Superiority of training pattern.

In fact, the application-based teaching model is a "college student entrepreneurship" model that stimulates students' interest. It mainly provides the guarantee for students' practice time and practice space in the form of after-school practice. In this mode, the teacher only plays a supervisory role and the students are fully self-managed. This not only ensures the order of teaching management, but also helps students adapt to social mechanisms. Teachers as technical practitioners are in the same position as students in this model, and also provide opportunities for their professional skills to improve.

IV. THE EXPLORATION OF COMPUTER SCIENCE AND TECHNOLOGY IN THE NEW SITUATION

The exploration of modern applied teaching mode should make full use of advanced resources and technology platform in teaching methods, combine engineering examples to mobilize the enthusiasm of students to actively learn, and cultivate students' ability to actively acquire knowledge to solve problems and meet the needs of applied industry talents. Applied teaching is to simulate the actual business operation in a small enterprise management mode within the university. This process is different from the original curriculum design in the semester or the limitations of the school hours, but the whole period of the student's enrollment to graduation for four years, so that students can experience the whole process of

internship while studying at school. The application-oriented teaching mode enables students to directly participate in professional and technical positions after graduating from the three stages of training, observation, and practice. (as shown in Fig. 1).

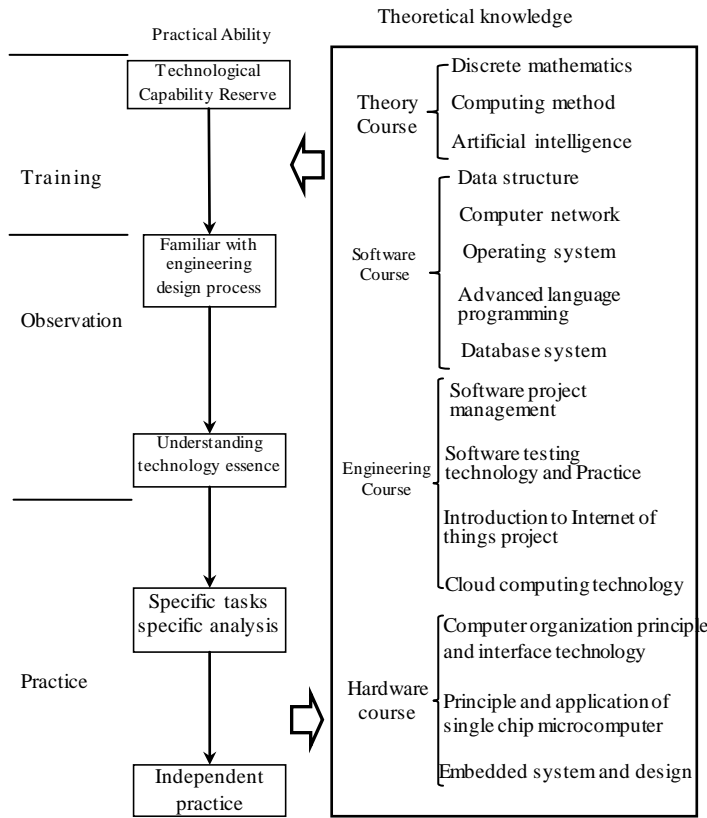


Fig. 1. Two-line mode of Applied Teaching

A. Training period of applied training pattern.

The training period is to transfer the theoretical knowledge to the students using the original system teaching mode. Of course, the theoretical foundation course runs through the entire university period of the students, and as the training period, only the basic theoretical knowledge essential in the application of professional practice is taught. When students understand the substance of the profession, they will also have an “impulse” of hands-on practice for practical applications. The key to any excellent form of teaching is to increase the interest of students in the content of the lectures and to motivate students to be active in learning. The motivation for practice in all forms should be the most representative.

B. Observation period of applied training pattern.

The observation period is based on the company's employee training process. The new recruits select professional groups according to their interests and follow the professional group to observe and learn. In this process, students of all grades are equivalent to entering the employees of the company

year after year, and students of the lower grades are led by senior students to engage in technical work. In essence, in the long-term traditional teaching mode, front-line teachers have a real experience that there must be a distance between teachers and students. Some students often ask for advice and classmates instead of teachers in the process of learning problems. Based on this phenomenon, students should be reasonably guided in the new teaching exploration, and students should be used to encourage students to learn knowledge.

C. Practical period of applied training pattern.

The practical period is the stage of improving practical ability. After the accumulation of the first two stages, students have acquired practical knowledge and skills and can be independent. What they lack is the practical experience of practical expertise. Therefore, the focus of teaching practice in this process is to give students full authority and practical opportunities. They can undertake small-scale application projects such as website construction and educational software design in various departments of the school. Multi-group competition is excellent for obtaining projects, and the tasks are completed according to the actual professional component workers. The students manage the project independently.

The core of teaching reform is to improve students' knowledge and professional skills. The mode exploration under the new situation divides the students' learning from the original single main line into two-line parallel. The whole process not only needs to cultivate the knowledge ability of the computer professional field, but also makes the students realize their own deficiencies through the project requirements of the actual case. According to the actual needs, they will continue to supplement the technical skills and the auxiliary knowledge of the project-related industries, and mobilize the enthusiasm of students to actively learn from the needs.

V. CONCLUSION

The cultivation of computer professionals has gone through a phase of practical exploration. The statistical data shows that the training objectives of modern application are of guiding significance. The "parallel" process that combines modern knowledge theory with engineering practice, with application practice as the driving force for promoting theoretical teaching, updating teaching concepts and deepening teaching reform. From engineering imitation to technological innovation, steadily improve the level of education and teaching, and improve students' comprehensive dormitory and application ability, laying a solid foundation for student employment and entrepreneurship.

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