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New Thinking About Computer Science Teaching Reform in Vocational Colleges

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Abstract

The rapid development of computer industry puts forward higher requirements for computer professionals. With the continuous social development, however, according to the feedback from the work performances of computer professionals trained by vocational colleges, there are many problems concerning the traditional teaching patterns, contents, and approaches to computer science in vocational colleges. Therefore, it is an imperative mission to carry out the teaching reform of computer science in vocational colleges at present. This paper firstly analyzes the current teaching conditions of computer science in vocational colleges, and then discusses the teaching reform direction of computer science in details.

Key words: Vocational colleges; Computer science; Interests; Teaching reform; Teaching quality

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INTRODUCTION

Higher vocational education is an important part of China's higher education. The goal of higher vocational education is to cultivate some high-quality technology-based and application-oriented talents who are capable of adapting to the production, construction, service, and management quickly in socialist modernization process. Since the 20th century, the society has made constant progresses, as well as the science. The development of computer science has made marvelous achievements. A variety of new technologies have sprung up, one after another. Meanwhile, computer, as a modern information tool, has been widely applied to every corner of each industry. "Be able to master computer knowledge and be familiar with uses of computer" have become the essential social requirements for each professional people. For students in vocational colleges, they must be equipped with this quality and competence. Computer application is a compulsory public basic course in vocational colleges. This course means to help students master computer theoretical theories and application skills, train them with operational abilities and help them make improvement. This course is the basis for other specialty courses, as well as the professional preparation for students entering the society and the work positions. At present, more and more computer professionals trained by vocational colleges enter various industries. And lots of industries have given timely feedback of work performances of computer professionals. According to the feedback, the specialty knowledge that students had learned from vocational colleges has been out of date and failed to meet the industrial needs. It indicates that lots of problems exist in the teaching ideology and teaching pattern of computer science in some vocational colleges. These conditions have badly affected the quality of computer professionals. In order to change this situation and make sure that the computer professionals can well adapt to the development of market economy in socialist modernization, current vocational colleges must face up to new thoughts and challenges concerning the teaching reform. These vocational colleges must conduct an extensive research and sufficient demonstration on the current teaching conditions, get rid of old teaching ideas and thinking patterns, make active explorations and innovations, and achieve the objectives of training more diversified, high-quality, and technical talents.

1. THE CURRENT TEACHING CONDITIONS OF COMPUTER SCIENCE IN VOCATIONAL COLLEGES

1.1 The Lower Basic Quality of Vocational Students

For most of vocational students who major in computer science, the study foundation is weak and the learning willpower is not strong, lacking of the spirits of assiduous study. Subjectively, they are eager to acquiring and mastering the skills of computer. However, they cannot find out the right study approaches and don't know how to study. Although some students have tried their best, the effects are still far from the expected results.

1.2 The Weakness of Teaching Staff

As a matter of fact, the professional teachers of computer science in vocational colleges are mostly good. Their teaching capabilities can meet the basic teaching requirements of computer science. And there is a batch of extremely excellent teachers among them. With necessary professional trainings, their teaching qualities and scientific research capabilities have been significantly improved and enhanced. However, they still lack of necessary practical experiences and professional skills of the computer science. In terms of teaching capabilities, only few teachers are good at some unified courses. The proportion is too small. Some teachers have no experiences in practices, so that they face many problems in improving the class teaching. Although many vocational colleges have put efforts on some activities, such as short-term trainings, practices in enterprises, visiting and exchanging, and studying abroad, these activities are mostly superficial because the trainings or visiting programs are usually short-term. It is impossible to improve the teaching levels of professional teachers fundamentally. Therefore, in the face of such practical problems, we must take action as soon as possible.

1.3 The Relatively Backward Teaching Equipment

In the training room for computer science, the number of computers should be equal to that of the students, equipped with servers, routers, hubs, and other related equipment. The training room should install different accesses to the Internet, which helps students to understand how it works. Besides, it can set up an independent team to develop small local training equipment. However, in most vocational colleges, the teaching equipment is relatively backward. The teaching facilities and software environment are far from perfect. Even so, some vocational colleges are still stuck in the one-chalk, three-feet-platform, and one-piece-of-blackboard traditional teaching mode in order to save teaching costs. The training room is equipped with backward computers, lacking of necessary learning facilities, which is no good for students' practices. In terms of teaching approaches, many vocational colleges usually choose to teach theories first and then practices, which irrationally separating theories from practices. The teaching effects are far from satisfaction. As a result, theories make students confusing, and practices make students panic. Sooner or later, students lost their interests in the specialty. The teaching results must be terrible. Based on this current condition, vocational colleges must improve the teaching equipment as soon as possible.

1.4 The Old Teaching Contents

The computer science develops at an amazing speed. The teaching materials in computer science are the systematic summarization of maturing computer technologies, which are replaced every 3-5 years. If the teaching materials of computer science in vocational colleges are relatively backward, lagging behind the time, and the teachers fail to update the teaching contents, students will find it difficult to catch up with the society after graduation. Although after years of hard study in vocational colleges, they find that the learned knowledge has been out of date once they start the first job in life. Furthermore, some vocational colleges have lower expectations for students of computer science. They only teach the students of computer science about the most basic knowledge, instead of systematic and deepening study and research. These vocational colleges do not focus on training students with capabilities of solving practical problems, neglecting the practices. Once teachers finish the classes, the task is done. They do not care about the feedback of students' learning. Accordingly, the graduates might feel dump if they encounter any difficult problems in work. What the students learned is not exactly what they need to learn before they get the job. Therefore, to open some computer application courses are the most urgent mission for the teaching of computer science in vocational colleges.

2. THE REFORM DIRECTION OF PROFESSIONAL TEACHING OF COMPUTER SCIENCE IN VOCATIONAL COLLEGES

2.1 Stimulate Students' Interests in Learning

In vocational colleges, the students of computer science usually lack of initiatives of learning. Their grades are ordinary. Therefore, we should pay more attention to stimulating and maintaining students' interests in learning from the registering to the graduation. Once they keep interested in learning, we can conduct some effective teaching approaches. Then, it will achieve the best teaching effects, with some effective teaching methods.

First of all, vocational colleges should provide specialty introduction and career planning education for

freshmen in order to improve their recognition to the specialty. As a matter of fact, many vocational colleges have already made progresses. The freshmen are just entering the vocational colleges. They have not developed a clear concept of colleges' teaching mode or purpose. They have no clear idea of their future prospects. They had made their professional choice with certain blindness and did not know what kind of changes the three-year vocational college life might bring to their life. Therefore, it is extremely important and necessary to provide the specialty introduction for them. In order to ensure that students are good at their specialty, we must help and guide them to understand and love their specialty. How to achieve the purpose is a critical and inevitable task for vocational colleges and teachers. So, we should introduce the characteristics of computer science, the talent-training purposes and patterns, the position of the specialty in society, and the prospects for the freshmen. By this way, the freshmen might develop strong interests in the specialty, generate confidence and driving force for future learning, and lay a solid foundation for the future.

Secondly, there are significant differences between middle schools and vocational colleges concerning the teaching approaches and learning methods. Previously, in middle schools, the education is dominated by teachers. Now, in vocational colleges, the education is students-oriented. The atmosphere is relatively relaxed. The study is completely on students themselves. However, most students are used to being "directed" by teachers. They might feel at loss once they are free to manage their time. Therefore, vocational colleges should invite professional teachers to explain the differences to the freshmen, and introduce relevant study methods. Otherwise, vocational colleges can ask some excellent seniors to convey their study experiences. By this way, it will help the freshmen find the appropriate way for themselves as soon as possible, developing new study habits, and adapting to the new study requirements.

Thirdly, on the basis of students' characteristics and the features of the computer science, teachers should conduct the most appropriate teaching approach to stimulate students' study interests. Some students may be interests in the computer science. But over time, with the increasing difficulties of the specialty, as well as some boring courses, certain students may feel disgusting about the specialty. Therefore, the professional teachers in vocational colleges must make reasonable arrangement of teaching styles and approaches, considering the specific features of the course. The teaching of computer science should stress on the capability of operation. So, we must emphasize on training students with operational capabilities in teaching. Besides, because of the various intellectual levels of students, teachers should conduct the multi-level teaching and make sure that all students at different levels make progresses. In addition, carry out the computer knowledge and ability contest regularly, and take it as a means to stimulate students' study interests. By this way, students generate a sense of competition. Wining the contest will satisfy them with a sense of honor and pride, and a sense of being useful.

2.2 Strengthen the Construction of Teachers' Morals

"Fish need water, and melon needs seedlings." Similarly, students' growth needs teachers' guidance. In China's traditional culture, teachers must fulfill the responsibility and obligation of "preaching wisdom, conveying knowledge, and solving confuses", and follow the rules of "being knowledgeable and moral". It demonstrates the importance of teachers for the growth of students. In China, the students in vocational colleges are in certain special state. They have many defects, such as bad study habits, and poor study abilities. Therefore, vocational teachers must possess abundant professional knowledge and morals, using the charm of characters to influence students, and guiding them with the excellent professional skills and teaching approaches. By this way, students may get rid of the bad study habits, master the most effective study methods, and develop a positive study atmosphere.

With the coming of information age and the popularization of Internet, the teaching approaches of computer science have changed significantly. The new teaching pattern requires teachers possess relatively higher level of computer. Therefore, vocational colleges should encourage professional teachers to participate into specialty training regularly, and make sure that these teachers completely understand the latest dynamics of computer science, know about the most advanced teaching methods and skills, and convey the information to students as soon as possible, benefiting the students.

Today, the popularization of "computer lab and Internet" teaching mode puts forward new requirements for teachers' morals. Because teachers' teaching and students' practices are in the computer lab, teachers can make best use of Internet resources to conduct the teaching. In a sense, it leads to good teaching effects. However, the Internet is a double-edged sword, in which there are a lot of good teaching resources, what we cannot deny, but there are also a lot of junk and bad information. Eighteen-year-old vocational students are still curious about everything. They are easily attracted or misled by some negative things. Class desertion is not surprising. Therefore, teachers must behave themselves by setting examples for students, no browsing bad and evil sites, and no playing games. Strengthen the ideological education for students and help them to distinguish the right from the wrong. Meanwhile, teachers should improve their own personalities, shape their own character charm, and affect students by means of words and activities. The construction of teachers' morals is critical to the development of teaching styles, study atmosphere, and

even the society, which is the most essential and long-term mission of vocational colleges. The teachers of computer science should understand the requirements of the age, catch up the space of the age, continue to improve professional skills and teaching methods, strengthen own morality, and try to cultivate more high-quality and competitive talents for the society.

2.3 Focus on Developing New Courses and Reform Teaching Pattern

The rapid development of computer technology requires that the curriculum and teaching materials of computer science must keep the same space with the age. The teaching contents should reflect the current situations and the future trends in computer technology. Many vocational colleges may have been bothered by problems of what kind of courses should open or what not. Years of teaching practices prove that the curriculum of computer science must follow the principle of being practical. If in blind pursuit of every aspect of the specialty, students will learn too much to achieve the expected result. It will seriously dampen the students' enthusiasm, instead of realizing the expected results. In terms of teaching materials, the same teaching material should not be used for many years. And the backward, outdated, and useless teaching materials must be discarded. Most of teaching materials focus on quality education and theories, i.e. emphasize on the background of knowledge system but neglect the update and development of new technology. The selection of teaching materials should be on the basis of the combination of teaching and learning. Teachers should select the most appropriate teaching material according to the characteristics of the course. The compulsory courses should be divided by specialties. The contents of teaching materials must meet the requirements of the specialty, changing the traditional "old, too-much, and in-depth" condition, and following the rule of "new, best, and simplification". Teachers should conduct the specialty-based teaching and personality-oriented teaching. In addition, emphasize on the practice part and improve students' operational capabilities and innovation abilities. Vocational colleges should aim at improving students' employability and entrepreneurial ability, training students with abilities of analyzing and solving problems, and equipping them with abilities of sustainable development and continuous study. As for the determination of the specialty direction, we should focus on the specialty connotation of "mainstream technology of computer science" and the talents training standards of "position description". The educational philosophy of vocational colleges is "service as the purpose, employment as the guidance", ensuring the right direction of specialty and the wide employment prospects of students. Therefore, in vocational colleges, teachers should lay more stresses on practices, completely changing the old fashion of only focusing on theories but practices. The practice teaching of computer-related courses, as practical courses, is very important, not matter for students mastering theories or applying computers to solve practical problems. So, we should insist on the same emphasis on practice teaching and theoretical teaching, combining the theories with practices. The computer operation practice can not only help students deepen the understandings of theoretical knowledge, but also help teachers know about students' learning, find and solve problems in learning in time. Before each operation practice, teachers should make clear arrangement, including the practice purpose, task, contents, and requirements. After the practice, students need to complete the report. By this way, students can operate computers with purpose. The practice training will further guarantee the teaching quality.

2.4 Improve the Teaching Conditions

The teaching of computer science is a continuously developing process. In order to improve the teaching effects of computer curriculum in vocational colleges, teachers must continue to update the teaching ideology in teaching practice and the colleges must improve the teaching conditions as well. As for the improvement of teaching conditions, the colleges can choose to cooperate with enterprises. Follow the connotation of computer science and the standards for talents training, actively explore the training methods of "work-study combination, develop the "teaching and learning" interactive system, and stimulate students' interests in the study. Adopt the teaching evaluation system and adjust the teaching and learning in time. Carry out the principle of "low-standards entrance and high-standards graduates". Vocational colleges can set up higher standards for the development of computer science, and build a strategic cooperation with enterprises, according to the rule of "college-enterprise cooperation, and sustainable win-win". Make best use of enterprise denoted facilities and teaching resources and achieve the in-depth integration of practice environment inside and outside. Arrange college-enterprise interactive activities regularly, and invite some enterprise elite or manager preaching the corporate culture, or some technical personnel introducing how to produce real software. By this way, students will participate into it soon. Vocational colleges update the facilities according to enterprises' needs, meeting the requirements of enterprises' production and development. Then, students can simulate the process freely. The learning effects will be satisfying. Vocational colleges train qualified talents for enterprises, and enterprises provide positions for graduates. It achieves the win-win.

In short, the teaching reform of computer science in vocational colleges is a long-term and continuously developing process. In order to change the teaching effects of computer curriculum, vocational colleges should create good teaching conditions and environment

for teachers and students. And teachers should update their teaching ideology in teaching practices, improve the teaching approaches, stimulate students' interests in computer science, help students acquire more knowledge and skills in limited study time, prepare them with sufficient knowledge and practice for the future position, and cultivate high-quality talents for the socialist construction.

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