

Chapter 7

Study on Training of Computer Science and Technology

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Abstract Computer science and technology program is not only one of the required programs in the modern colleges and universities, but also necessary knowledge and skill that are required by the information age on talented personnel to possess. At present, seen from the teaching activities and training situation of computer science and technology in Chinese colleges and universities, some progresses have been made, but there is still a greater development space for it. In this paper, some suggestions are proposed by the author on the training of the computer science and technology personnel in colleges and universities, only for the academic exchange.

Keywords Computer · Science and technology · Personnel training

7.1 Introduction

With the continuous deepening of Chinese reform and opening-up policy, extensive attention has been paid to computer science and technology program from all walks of life.

Colleges and universities, as senior personnel training institutions in China, undertake the mission to cultivate professional talents for the country in the new century.

Therefore, how to make an enhancement and improvement to the training of the computer science and technology personnel in Chinese colleges and universities has proven to be a major problem that has a close tie with the information technology development and even the whole social and economic development.

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7.2 Current Situation and Shortcomings of Computer Science and Technology Program

The employment problem of the graduates from the computer science and technology program in colleges and universities can be mainly reflected from that the quality and ability of the graduates cannot adapt to the requirements and expectations of employing units.

The most effective way to solve such a problem is to make an enhancement to the reform of training the computer science and technical personnel in colleges and universities and attach higher importance to the combination of strength and practice in the process of learning, so as to make students meet the requirements of social development.

7.2.1 Key Problems in the Process of Computer Science and Technology Program to Train Personnel

Through the understanding of the personnel training idea in the traditional computer science and technology program [1], it is found that it is a subject based on the theory of algorithm and requires the students necessarily to possess corresponding algorithm knowledge and research ability.

This, therefore, makes the traditional colleges and universities attach higher importance to the academic attainments and research potentials of students in the training of computer science and technology personnel.

However, the imbalance of this ability exactly goes against the requirement of the current society on the computer science and technology personnel.

Generally, what the society and employing units demand are increasingly more graduates with advantages in practical operations and practice ability.

7.2.2 Analysis on the Specific Reasons for the “Difficult Employment” of Graduates from Computer Science and Technology Program

7.2.2.1 Untimely Adjustment to the Program Location

The education of the computer science and technology in China’s colleges and universities does not keep pace with the development of the times, but stays in a relatively backward stage and level.

The disjoint between this program location and the market demand is one of the most important reasons for the difficult employment of the graduates from the computer science and technology program in colleges and universities.

7.2.2.2 Relatively Backward Teaching Methods and Contents

At present, the majorities of colleges and universities in China do not timely make an update and adjustment to the teaching methods and contents in accordance with the characteristics of the computer science and technology subject.

7.2.2.3 Ignoring Practice

Based on the traditional teaching idea in China's colleges and universities and the main contradiction mentioned above in the professional training of the current computer science and technology program [2], many colleges and universities in the country do not really implement the practical operations and relevant practice activities for students.

This also makes the students in colleges and universities have only theory knowledge in computer science and technology but no practice enhancement.

7.2.2.4 Imperfect Faculty Construction

From practices, it is found that the teachers of the computer science and technology program in colleges and universities are mainly oriented at specialized knowledge impartation. They are not involved in the researches related to the computer science and technology and also the other kinds of practical operations and technological application activities.

7.3 Important Significance of the Reform for the Personnel Training Model of Computer Science and Technology Program

First of all, the operational and practical abilities of these graduates are not powerful. Relevant theory knowledge has been learnt by them, but cannot be put into practice.

Second, computers cannot be operated by these graduates proficiently, and also the methods for processing some commonly seen problems are not known well.

From these two points, it can be learnt that a number of computer science and technology personnel cannot meet the needs of enterprises on recruitment.

Besides, the comments that are made by the managers of the human resource departments of the enterprises can be mainly concluded as follows: (1) the graduates from the computer science and technology program in colleges and universities are in shortage of the relevant practice experience; (2) the graduates do not possess a clear understanding of their career development and self-growth;

(3) the innovation ability as well as the analysis ability of the graduates is far away from being powerful; (4) the psychological quality of the graduates is relatively poor.

Therefore, after a great number of problems in the computer science and technology personnel trained from colleges and universities are known well, it is highly necessary for us to timely make an adjustment to the teaching model.

Only the teaching and education reform are continuously deepened, the teaching contents and objectives are adjusted, the teacher resources and structures are improved, and high importance is attached to the guidance for the practices of the students, the students studying in the computer science and technology program can really develop a comprehensive ability that makes theory and practice combined and meet the needs of enterprises on recruitment and the development of the society.

7.4 Specific Measures of the Reform for the Computer Science and Technology Program

After a conclusion is drawn up on the work experience of many years, the author thinks that a good effect can be achieved if the reform for the computer science and technology program in colleges and universities can be conducted from the several aspects in the following.

7.4.1 Changing the Traditional Teaching Idea

Teaching idea is the foundation for the development of all teaching activities. In the traditional teaching idea, high attention is paid to the impartation of the theory knowledge and the receiving study of the students, and especially to the training of the students' academic ability as well as the development of the potentials.

Obviously, this teaching idea has been unable to fulfill the social development needs of China and the current development situation of the information technology in China. Especially for some higher vocational colleges [3], it goes against the demands of society if importance is only attached to the training of theory knowledge.

In the modern times, what the enterprises need are increasingly more operational personnel and technicians, but not the specialized researching personnel. Based on this, changing the traditional teaching idea in the computer science and technology program is the first step of the reform for the personnel training model of the computer science and technology program.

It is necessary to pay more attention to the market orientation of the information age and the standards for the application-oriented talents in the new teaching idea, and then talented personnel can meet the needs of the future development.

7.4.2 Changing the Traditional Teaching System and Curriculum Setting

According to the lacked quality above mentioned by the managers of the human resource departments of the enterprises, it is necessary to train the students with a clear purpose, making them become professional technical personnel who have good psychological quality, communication ability, and analytical ability in the process of learning.

In the setting of curriculum, schools can divide the courses of the computer science and technology program into all sorts of required courses and elective courses in accordance with the gradual segmentation of the social division of labor in the modern times, so as to make it easy for students to select courses based on their own research orientation.

In addition, the flexible setting of curriculum is also helpful for students to give full play to their own initiative, exercise and train their planning ability in the process of learning, and also make a right choice when facing up with the social competition and enterprise recruitment.

7.4.3 Carrying Out School-Enterprise Cooperation and Constructing Project-Oriented Practice Base

It is necessary for colleges and universities to seek many kinds of methods for making an enhancement to the practices.

After many explorations, it is found by us that carrying out the school-enterprise cooperation is one of the very effective ways.

That is, the real field practice opportunities can be provided by the enterprises for students in the cooperation, and simultaneously the colleges and universities can provide a top priority for the enterprises to select technical supports and talented personnel.

Under this situation, the students can perceive and experience the working process by going deep into the real operational links of the enterprises, and also can get an in depth understanding of the significance of the application of the computer science and technology.

In the mean time, the students can know well the latest development conditions and achievements of the information technology in combination with the market

trends in the process of practices, and also can get a broadened outlook, and hence can make a good preparation in advance for changing from the learning in school to the working in enterprises.

7.4.4 Constructing a Double-Quality Teacher Team

The role of the teachers played in the whole teaching activity is very crucial, and also the teaching model, which is targeted at training the application-oriented talented personnel, puts forward a higher requirement on the teacher team. This needs the double-quality teachers who not only have the ability in the theoretical teaching, but also possess the ability in the designing, development, and application of enterprise project.

In general, the double-quality teachers possess the relevant practical application and development experience, and have the ability to get a good understanding of the main points of course in-depth in the processing of teaching theory courses and also provide students with detailed explanation in combination with the specific application cases.

In the process of teaching practice-oriented courses, the double-quality teachers have the ability to make a thorough analysis on the problems in the application projects and also present it to students with a clearly imperative way, so that the students studying in the computer science and technology program can easily get a real understanding of the theory and practice knowledge.

In the mean time, the double-quality teachers can provide the students with a great number of positive supports and helps in the professional technology and employment, and also build up a very good example for the application-oriented talented personnel.

In the process of constructing a double-quality teacher team, schools can take full advantage of a variety of forms, and encourage and support theory-oriented professional teachers to actively participate in the application and development of enterprise projects, so as to promote the teachers to attain a chance for practicing and improving their application ability.

Also, schools can employ the front-line development and application personnel to take part in the teaching work of practice-oriented courses. It has been repeatedly emphasized and mentioned that computer program is a program that is highly oriented at practices.

With the purpose of making the trained students melted into a job quickly, it is necessary to make an enhancement to the practical ability of the students studying in computer program.

Also, it is necessary for colleges and universities to make a change to the original teaching model of the computer program, target at training the application-oriented talented personnel, reform the teaching system and course design, actively strengthen the cooperation with enterprises, establish practice bases for students, and construct a double-quality teacher team.

7.5 Conclusion

From the above analysis, along with the application of computers and especially the popularity of network application, the computer science and technology as well as its application have attained a very great development in China in recent years. In the mean time, the education of the computer program has developed very rapidly.

However, the present situation is that the majorities of the graduates from the computer science and technology are in shortage of the ability in the practical application, development, and design, and cannot apply the knowledge in the computer science and technology program in production and life.

At the employment market of the computer science and technology program, a great number of talented personnel are urgently required by enterprises.

However, it is difficult for the enterprises to choose job seekers that they feel satisfactory with; the graduates trained from colleges and universities are hard to meet the needs of the enterprises, and the employment rate continues to decline.

Today, computer has been popularized in the life and work of people. What computer talented personnel that are needed by the information-based society and how colleges and universities timely make an adjustment to the training orientation and teaching methods of the computer program according to the development of the information-based society and train the computer talented personnel meeting the social demands are worthy of our attention.

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