

# Research on practical teaching reform of computer specialty under the background of new engineering

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**Abstract:** at present, China is in the era of vigorous development of computer science and technology. The development of social economy and industry requires application-oriented colleges and universities to output a large number of new computer technology talents in line with the development trend of the times. Professional practice is the source of strength to achieve this goal. The concept of new engineering has provided a new perspective for the practical teaching reform of computer specialty from its proposal to development. Therefore, it is of great significance to carry out systematic research on the practical teaching reform of computer majors in Colleges and universities from the perspective of new engineering. Based on the brief introduction of the concept of new engineering and the existing problems and reasons of practical teaching of computer specialty under the background of new engineering, this paper focuses on the effective strategies of practical teaching reform, in order to provide strong support for the cultivation of computer talents in the new era and the construction of new engineering in China while comprehensively improving the quality of practical teaching.

**Key words:** new engineering; Computer major; Practical teaching; Introduction to reform strategy

With the development of the times, the traditional engineering has undergone earth shaking changes, and the new concept of Engineering arises at the historic moment. Compared with the training requirements of traditional engineering talents, the new economy and emerging industries in the future put forward new requirements for computer technology talents. The development of society and the country especially needs compound new engineering talents with strong practical ability, innovation ability and good quality. Therefore, Local Application-oriented Undergraduate Colleges and universities need to spend a lot of time and energy on the reform of practical teaching of computer majors, try their best to cultivate students' ability to operate and solve complex problems, and help students' long-term development while improving the overall quality of professional practical teaching.

## 1 New engineering concept

The concept of new engineering was first proposed back in 2017. New engineering is a new direction of education reform proposed under the background of the new economy. It has obvious characteristics of the times and development. It is an inevitable choice based on national strategy, industrial demand and economic development.

Different scholars have given different interpretations of the connotation of new engineering. According to the views of many scholars, we can see that the connotation of new engineering is extremely rich and covers a wide range. Sometimes it is a dynamic concept, and sometimes it is a broad concept. From the perspective of broad concept, new engineering represents the latest direction of education reform, and dynamic mainly refers to the characteristics of continuous development and progress of new engineering. With the continuous progress of the times, only by timely adjusting the training mode of professional talents and comprehensively improving the lag of their response to the talent market, can colleges and universities make new engineering talents more meet the needs of industrial development.

## 2 Existing problems and reasons of practical teaching of computer specialty under the background of new engineering

### 1. Existing problems in practical teaching of computer specialty under the background of new engineering

#### (1) The goal of practical teaching is vague, and talent training deviates from professional practice

The computer specialty has strong practical characteristics in the scope of the new engineering specialty. In the actual teaching process, we should pay more attention to the practical teaching link. For a long time, although most colleges and universities have realized the importance of practice, due to the one-sided interpretation and cognition of the connotation of practice, the practice teaching goal is vague, and it is easy to ignore the "ability based" school running purpose of Application-oriented Undergraduate Colleges and universities. The specific performance is in two aspects. On the one hand, colleges and universities do not have a correct understanding of their own characteristics and advantages. In some colleges and universities in China, there are still problems that talent training deviates from professional practice, especially the professional characteristics and advantages can not be highlighted, which leads to the failure to achieve the practical teaching objectives of computer majors as soon as possible. On the other hand, the goal of practical teaching in Colleges and universities tends to be similar. Some colleges and universities will blindly pursue comprehensive and developmental goals, which ultimately makes the teaching characteristics of computer majors unable to be reflected, and the goals tend to converge seriously.

#### (2) The content of practical teaching is outdated, and the update speed lags behind the social demand

For a long time, the practical teaching of computer majors has focused on theory and knowledge, and the proportion of practice is relatively small. In the teaching process of the only practical courses, students still mainly imitate teachers' operation, while teachers' guidance on students' flexible application of knowledge to solve practical problems is seriously lacking. More importantly, the arrangement of teaching content is far from the actual problems. Especially with the emergence of new concepts such as artificial intelligence, big data,

cloud computing and so on, from the perspective of the practical teaching content of computer specialty, there are many problems, such as the old content and the update speed is far behind the development speed of information technology. The teaching content is difficult to meet the needs of social development, which directly hinders the realization of the training goal of computer talents.

(3) Lack of practical teaching resources, teaching quality is difficult to be guaranteed

Fundamentally speaking, practical teaching needs a lot of manpower, material resources and a series of resources to support and input, but the current situation is that the practical teaching funds of computer majors are tight, and the conditions of hardware and software facilities and equipment are seriously insufficient, so it is difficult to invest more funds and energy in the construction of double qualified teachers. In addition, with the gradual increase in the number of undergraduate students enrolled in Colleges and universities, facing the large-scale new engineering education, the already insufficient funds for running colleges and universities and practical teaching resources have been more limited. Due to the serious shortage of practice base, it is often unable to meet the needs of students for professional innovation and practice, which directly affects the overall quality of practical teaching.

2. The main reasons for the existing problems in the practice teaching of computer specialty under the background of new engineering

(1) Lagging teaching philosophy

Under the guidance of traditional teaching ideas, the practice teaching of computer majors still adopts more traditional teaching methods. In short, more attention is paid to knowledge explanation and skill teaching, and students have few opportunities to participate in practice independently. Their subjective initiative and creative thinking are limited to varying degrees, which not only can not meet the needs of high-tech industry, And the cultivation of outstanding computer talents is out of reach. From this point of view, the traditional teaching concept is not suitable for the effective development of practical teaching of computer specialty under the background of new engineering. Undergraduate colleges should break through the traditional teaching concept from different angles and aspects.

(2) Single teaching form

At present, through the actual investigation, it is found that the practice teaching of computer majors in some colleges and universities still adopts the traditional single teaching form of “teachers’ teaching and students’ learning”, ignoring the training and training of students’ ability to analyze, solve problems and practice. Similar cramming teaching methods will only lead to students’ ignorance of knowledge, which is not consistent with the cultivation of innovative thinking advocated by the new engineering. Therefore, it is urgent to innovate the practical teaching form of computer specialty.

(3) Weak teaching efforts

As the saying goes, practice makes perfect. It has become a very important issue to pay more attention to practical teaching. If teachers and universities can not pay attention to the teaching practice of computer specialty, the consequences will be quite serious. At present, the requirements of enterprises for employees are no longer only focused on theory. On the contrary, it is more necessary for employees to give full play to their unique role and value in the specific practical operation process.

### **3 Effective strategies for practical teaching reform of computer specialty under the background of new engineering**

1. Focus on the goal of talent training and clarify the teaching concept

Through the analysis of foreign rich teaching experience and talent training mode of computing specialty, it is not difficult to find that the construction of practical teaching system of computer specialty in most colleges and universities is closely around the new engineering concept and talent training objectives. To some extent, advanced teaching concepts play a guiding and positioning role in the construction of practical teaching system for computer majors, and guide the direction of professional teaching reform.

First of all, under the background of new engineering, application-oriented undergraduate colleges and universities should completely break the traditional concept of practical teaching, change the imparting teaching into guiding teaching, fully mobilize the enthusiasm and initiative of students to participate in computer practice activities, and guide students to apply their knowledge to practice in time, While helping them strengthen their understanding of knowledge, they can also improve students’ practical ability.

Secondly, enrich the concept of practical teaching. College teachers should update and expand the teaching concept from the depth and breadth, pay attention to highlighting the openness and advancement of the concept, create a relaxed and open classroom for students, especially pay attention to cultivating students’ innovation consciousness, and guide them to actively explore the practical skills of computer operation.

Finally, connect industries and industry concepts. The foothold of new engineering construction is to connect and meet the requirements and demands of the industry. The purpose of computer specialty education and teaching is to cultivate more qualified computer science and technology talents for related industries. To achieve this goal, the construction of new engineering needs to adjust the pace of practical teaching according to the changes of the industry through sufficient market and industrial research, based on a detailed understanding of the existing problems in the practical teaching of computer majors, so as to make talent training more in line with the needs of the industry, Only in this way can we improve the abilities of talents trained by computer majors in application-oriented universities, and inject new vitality and vitality into professional practice teaching.

2. Innovating practical teaching methods and advocating the combination of science and education

In the process of constructing the new engineering practice teaching system, for computer majors, diversified practical activities and flexible and innovative teaching methods are more conducive to cultivating students’ practical innovation ability and comprehensive ability.

Therefore, both teachers and universities should thoroughly implement the requirements of the new engineering, fully mobilize students' thirst for knowledge, encourage them to actively participate in professional practice training, and truly achieve the goal of teaching and learning.

First of all, the practical teaching of computer majors should no longer be limited to a single traditional teaching method, but should innovate and introduce flexible teaching methods such as heuristic, inquiry and discussion in the process of combining scientific research projects and practical teaching, and put the cultivation of students' innovative consciousness and inquiry spirit in the first place. The creation and improvement of the core competence of computer science and technology talents is the top priority of the construction of new engineering. Therefore, we should fundamentally innovate the organizational form of practical teaching, change the single teaching method, and practically complete the innovation of practical teaching of computer specialty.

Secondly, the practice teaching reform of computer specialty in application-oriented universities should be promoted in the form of competition to promote learning. When students just enter the University, the school can cultivate them according to their learning interests. For low-grade students, the main goal of practical teaching is to actively cultivate students' learning interest and motivation, and encourage them to actively participate in various national computer trials and competitions, improve their programming ability, and cultivate their core literacy. For senior students, it is necessary to guide students to accumulate rich practical experience, improve their practical ability and cultivate their professional quality through various programming training and project practice. Through the practice of the whole process, more excellent works will emerge in the computer competition, which will drive the orderly promotion of innovation and entrepreneurship education practice from point to area. At present, the more famous competitions nationwide include "Internet + College Students' innovation and entrepreneurship competition", "information technology professionals competition", "Chinese college students' programming competition", etc.

### 3. Carry out school enterprise cooperation education and deepen the integration of production and education

Based on the requirements of new engineering construction, Local Application-oriented Undergraduate Colleges should pay attention to establishing long-term, stable and win-win cooperation with enterprises, and form an effective mechanism of industry university cooperation and collaborative education. In short, school enterprise cooperation education is to closely connect students, schools and enterprises. At the same time, each party has its own responsibilities, give full play to the unique advantages of education resources of schools and enterprises, provide a good environment and platform for the practical training of computer majors, and effectively combine the school courses and off campus practice, It lays a solid foundation for cultivating students' practical and creative ability and comprehensive quality.

Colleges and universities can try the school enterprise cooperation mode with local well-known enterprises, and cooperate to establish production, learning and research bases, and build industrial colleges. During the period of school enterprise cooperation, the school can give full play to its own advantages in intelligent information processing and big data mining, and promote the digital transformation of colleges and universities in combination with the successful experience of cooperative enterprises in computer software development and product promotion, so as to accelerate the transformation and industrialization of scientific and technological achievements of colleges and universities. Teachers and students participate in the research, development and maintenance of computer projects in schools and enterprises. Students with excellent comprehensive performance can stay in enterprises to participate in more project development and other work after graduation, and receive certain remuneration.

The school enterprise cooperation in the construction of the industrial college will truly provide an important base for the practice and training of students majoring in computer science. During the training period of the industrial college, enterprises and universities should respectively send teachers to form a double qualified team, which is responsible for the practical teaching of students. By introducing the real projects of the enterprise, the students can be really familiar with the responsibilities and requirements of each position through participating in each link, and further increase their practical ability. At the same time, enterprises can also invite excellent students to work in the company after graduation, which is conducive to solving the employment problem of students on the one hand, and on the other hand, it is believed that the reform effect of 1+1>2 can be truly achieved through the joint efforts of colleges and enterprises in the practical teaching reform of computer majors.

## epilogue

In a word, the new engineering should completely surpass the thinking mode and concept of traditional engineering, endow the traditional engineering with new connotation and new concept from the national strategic development needs and the new situation of economic innovation and development, build a new structure of computer specialty, explore a new mode of high-tech talent training, and truly contribute to the practical teaching reform of computer specialty. Talent training brings new development opportunities.

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