

# Research on How to Cultivate the Innovation Ability of Computer Major Students in Colleges and Universities

Feng Wang<sup>1, a</sup>

<sup>1</sup>Zhoukou Normal University, Zhoukou 466001, Henan, China.

<sup>a</sup>wang7984@163.com

## Abstract

Computer is a special professional field; the biggest characteristic is that the knowledge is updated quickly. Through the research and analysis of the innovation ability of current computer students, the author finds that the existing teaching system of computer specialty cannot meet the needs of students' innovation ability training, especially with the development of society, economy and information technology, the society and enterprises cannot meet the needs of computer professionals. The requirement of innovation ability is higher and higher, which makes the traditional teaching system of computer major lag behind. In order to improve the innovation ability of computer science undergraduate students majoring in, The author puts forward a chain teaching system according to the needs of the computer major students' training. After preliminary practice and statistics, the system shows good results.

## Keywords

Computer major, innovation, teaching system.

## 1. Introduction

With the rapid development of higher education, various colleges and universities have gradually set up computer related majors, and they have trained a large number of computer professionals for the society. However, the current computer undergraduate teaching is not perfect. In recent years, in the computer undergraduate teaching, classified teaching method, project driven method, etc. have been put forward successively; [2][3][4] is pointed out that the project driven teaching method is a teaching method to train students and promote students' practical learning by involving students in the project. However, these teaching methods are all biased. Classification teaching is too utilitarian and only pays attention to knowledge acquisition, which will inevitably result in students' weak comprehensive ability and limited innovation ability. In addition, through the analysis of the teaching cases of the project driven method, it is found that the teaching method can only benefit those students who have already learned well, and cannot improve the learning level of the overall students. Especially at the present time of the introduction of the project, if the students have a poor foundation, they cannot complete the project, but also cause a huge blow to their confidence, resulting in the psychology of learning weariness of the computer major. Therefore, in order to improve the innovation ability of computer students, a new teaching system chain teaching system is proposed.

## 2. Chain Teaching System

Chain teaching system pearl chain teaching system is a kind of progressive teaching system designed from the top, which divides the four years of university into four stages to form the main line of the system. They are enlightenment stage, teaching learning stage, learning

auxiliary stage and self-study stage. In Pearl Chain teaching method, pearl represents the effect and result of teaching and learning.

A. in the initial stage of higher education, the starting point of undergraduate stage is high school education, but there is a big difference between teaching and learning. Therefore, in the initial stage of undergraduate course, we should first change the learning mode of students, change the passive learning mode to the active students' interest in the computer major, and focus on cultivating students' steadfast and rigorous learning around the quality of the major Learning attitude, pay attention to cultivate students' habit of being good at thinking and diligent in thinking, pay attention to cultivate students' tenacious perseverance when facing problems: finally, cultivate students' ability of self-summary and self-learning.

B. the first stage of teaching and learning is the first stage of teaching and learning, focusing on the basic theory of computer, basic language

The teaching of basic application enables students to master the most basic and commonly used theoretical knowledge and practical cases. Through the teaching of teachers, students can solve the corresponding problems on the basis of gradually mastering the basic knowledge.

C. learning and assisting stage is in learning and assisting stage, mainly focusing on the cultivation of students' problem-solving ability. The teacher designs the established problem and instructs the students to solve it. At the same time of solving the problem, we should supplement the basic knowledge of solving the problem, train students' thinking, methods and skills of solving the problem, sort out the existing knowledge involved and deepen their understanding.

D. in the self-study stage, students focus on the whole process of finding, analyzing and solving problems. The teacher gives the case, arranges the students to find out the problem comprehensively, then analyzes the problem, finally solves the problem.

E. teaching effect pearl chain teaching system represents students' ability to solve problems

It not only embodies the effect of teaching and learning, but also reflects the evaluation feedback of teaching and learning. In each stage and period of teaching, teachers set up a comprehensive task and arrange students to solve it according to the knowledge and ability they have learned and the current goal.

### **3. Improve the Innovation Ability of Computer Students by the Operation of Chain Teaching System**

A. Teaching arrangement and teaching method in the enlightenment stage, focus on the development history of computer and its application status, information retrieval, simple basic computer programming language, how to solve problems, the quality of scientific workers and other similar courses. Guided and interactive teaching is mainly adopted to arouse students' interest in computer science and technology. Students learn to analyze and think before encountering problems, and solve problems by searching and analyzing data on the Internet. In the first stage of teaching and learning, the emphasis is placed on the teaching of students' basic knowledge and the expansion of students' knowledge, so that students can master the relevant knowledge and basic methods to solve basic problems, and know what information to retrieve in front of problems. Therefore, in this stage, the basic courses of computer specialty are mainly offered, such as mathematics, database, computer composition principle and computer network. When teaching these courses, the teacher will extract the common and basic theoretical knowledge, give the students key explanations, and expand the rest

B. The learning methods of students in the chain teaching system are as follows.

Active learning means that students keep a strong interest, actively explore problems and try to solve problems.

The premise of autonomous learning is that students master retrieval data and analyze data analysis methods. The key of autonomous learning is students' rigorous, scientific and realistic learning attitude and perseverance in front of problems.

The premise of interactive learning is to cultivate students' good communication ability and sense of teamwork. Interactive learning not only refers to the interaction between teachers and students, but also refers to the interaction between students and knowledge carriers such as the Internet.

Active and interactive learning also includes learning methods.

C. Each link of chain teaching is the symbol of students' problem-solving ability, and the ability is abstract. The problem is concrete. Therefore, in each learning process, teachers should set problems with moderate difficulty, so that students can learn with problems, understand what knowledge they have gained through learning, what abilities they have developed, and what problems they have solved at last. In the chain teaching system, the biggest task of teachers is to set problems, cases and tasks, including knowledge transfer and ability training. The process of learning to solve problems is the process of acquiring knowledge and cultivating ability.

D. Each link of chain teaching should pay attention to the teaching of open questions, and improving the education content and methods that have been followed for a long time is not conducive to the cultivation of students' innovation ability. As a discipline with strong thinking, computer has its unique conditions in cultivating students' innovative thinking. The teaching of open questions can fully stimulate students' creative potential, especially for the training of students' thinking flexibility and creativity. Therefore, in the teaching of open questions, the selected questions should not only have certain difficulties, but also be acceptable to most students. They should not only contain innovative factors, but also leave room for students to fully display their intelligence from different angles and levels. For example: To investigate the extracurricular activities of students in our school, we must give students enough time and space to fully explore and exchange in the face of this relatively complex topic.

E. In the chain teaching system, we should respect the individual differences of students, carry out stratified teaching and carry out positive evaluation. Wallace, an American psychologist, points out that the individual differences of students and teachers' quality will affect the cultivation of students' creativity and creative personality in the teaching process. Therefore, when teachers regulate the teaching content, they must teach at different levels in the depth and breadth of knowledge, adopt various teaching methods and learning guidance strategies as much as possible, recognize the individual differences of students in teaching evaluation, and put forward different learning requirements for students with different degrees and different personalities.

F. In the chain teaching system, we should pay more attention to the interaction between teachers and students, let students feel the charm of "subjectivity", and stimulate students' enthusiasm for innovation. The traditional teacher-student relationship is a kind of unequal relationship that advocates the dignity of teachers. How can teachers, who are high above the others, follow the book to teach and fill the room, cultivate students' innovative ability? The new curriculum reform puts forward a new concept of teaching, emphasizes the interaction between teachers and students, advocates active and diverse learning methods, and the relationship between teachers and students is equal. Students' thought, will, emotion and behavior should be respected equally. Students should be given enough opportunities to show their talents and express their thoughts and emotions. In order to create an equal, respectful, harmonious and developing relationship between teachers and students, let students move and let the classroom live, teachers should establish the concept of equality between teachers and students and pay attention to emotional integration with students. Let the students regard the classroom as the stage of self-discipline, self-display, self-shaping and self-education. In this

way, we can stimulate students' enthusiasm for innovation, open up their thinking, and turn the classroom into the main position of quality education focusing on innovation spirit and practical ability

#### 4. Conclusion

According to the pearl chain teaching mode, the results show that the computer students trained under this teaching system have excellent performance in both hands-on practice and innovation. As the system is still in the trial stage, there are inevitably deficiencies, such as the selection of supporting materials and textbooks is not satisfactory.

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